

EXTERNAL FACTORS AND THE INTERFERENCE OF L1 ESTONIAN ON L2 ENGLISH PRONUNCIATION: AN APPARENT-TIME STUDY

Kristiina Ader, Merilin Miljan

Abstract. This study focusses on external factors of second language learning (L2) and their effect on L2 sound production. The aim was to find out whether young adults whose first language (L1) is Estonian speak L2 English with less accent than older speakers of L1 Estonian. Prior studies have claimed that more exposure to the target language lessens the effect of L1 interference (internal factors) (e.g. Piske et al. 2001, Muñoz, Llanes 2014). An apparent-time study was implemented in order to test whether a change in learner setting (i.e. limited exposure to the target language vs. abundant exposure) shows any evidence which can be explained by such external factors. Data was elicited from the speech samples of 97 speakers of L1 Estonian and L1 interference effects were analysed sound by sound. The results show that the younger generation displays less L1 Estonian interference than the older generation. Both greater exposure to the target language and earlier age of L2 learning onset correlate with the ability to produce more sounds target-like.*

Keywords: second language acquisition, L2 phonology, external and internal factors, English, Estonian

1. Introduction

From very early age on, speakers attune to the phonetic system of their first language (L1). Prior work has established that when another language is learned or acquired, the phonetic system of L1 interferes with the new sound system of a foreign language (L2) resulting in a “foreign” accent (e.g. Flege 1991, Piske et al. 2001). The focus of research in L2 phonology has been on pinning down the exact factors which cause such an interference in L2 pronunciation. Until recently, the explanations were based

* We are very grateful to Madis Paukson, Lemme Kitsing, and teachers of Tallinn Mustamäe College for their help and assistance in collecting data, and to Miriam Anne McIlpatrick-Ksenofontov for helping to analyse the data. We also thank all the informants who took part in the study, and the two anonymous reviewers for their useful comments and suggestions.

entirely either on internal, i.e. neuro-cognitive factors such as the age of L2 learning, attitude and motivation (e.g. Scovel 1988, Piske et al. 2001); or on external, i.e. social, factors such as the amount and type of exposure to the pronunciation of the target language, the length of residence in the country of the target language, among others (e.g. Flege, Liu 2001, Brown 2007). Currently researchers have started to question the strict divide between the internal and external factors, especially Moyer (2014), and are discussing the importance of studying both types of factors together in order to find the intersection of these distinct factors. This paper provides a contribution to this debate by studying the pronunciation of native speakers of Estonian in their L2 English in a wider time span. It reports an apparent-time study which surveys two different generations of a population at one point in time with the aim to find out whether and how external factors, such as the quantity and quality of experience in the target language have affected the L2 English phonology of L1 Estonian speakers and how it interplays with the age of L2 learning onset.

The second aim of the study, but no less important, is to provide empirical evidence to the “problematic” areas in L2 English pronunciation of L1 Estonian speakers, as outlined by few observations (Kostabi 1993, Mutt 1971). These findings have implications for teaching the pronunciation of L2 English to L1 Estonian speakers.

1.1. Internal and external factors in L2 pronunciation

As mentioned above, prior studies have established that children acquire the phonetic system of a foreign language relatively easily compared to adult language learners (e.g. Piske et al. 2001, Flege 1991). Thus age is seen as one of the most important factors and formulated as the Critical Period Hypothesis, which states that “complete mastery of an L2 is no longer possible if learning begins after the end of the putative critical period” (Piske et al. 2001: 195). This hypothesis has generated many studies on internal factors affecting L2 pronunciation. For example, Granena and Long (2013) studied Chinese learners of L2 Spanish (starting at the age of 3–6, 7–15, and 16–29) and found that there are sensitive periods in different language domains: the ability to acquire phonology starts to decline before the ability to acquire lexis and collocations, which in turn declines before morphosyntax; the latest ages of onset which yielded a native-like acquisition were 5, 9, and 12, respectively. Piske et al. (2001) analysed the pronunciation of L2 English by L1 Italian speakers, focusing on the possible influence of age on L2 learning, the extent of their L1 use, and the length of residence in the country of the target language, Canada. They found that although both the age of onset of L2 learning and the extent of L1 use play a significant role in gaining the native-like pronunciation, the age of L2 learning onset appeared still to be more influential. Yet there are studies which question the onset of L2 learning as the major factor. For example, Flege et al. (2006) compared the accent in L2 English of native Korean children and adults and found that children had a detectable foreign accent, although “milder” than the one of adults. This raises a question whether the late learners are predetermined to be significantly less successful at achieving native-like pronunciation than younger learners.

Learner’s L1 interference with the pronunciation of an L2 can be attributed to the articulatory settings of L1. That is, speakers tend to produce the sounds of a

new phonological system which sound similar to the sounds in their L1 in a similar manner: they may substitute certain L2 sounds with the sounds of their L1. This is where the difference between late and early learners lies, because younger learners are less attuned to their L1's phonetic system and therefore are able to establish new phonetic categories more easily (e.g. Flege 1991). Yet, there are late learners who have managed to acquire almost native-like pronunciation. As Marinova-Todd et al. (2000) note, researchers tend to focus on the average scores of adult informants and ignore the most successful ones. One of the studies which has specifically focussed on native-like learners is by Abrahamsson and Hyltenstam (2009). They conducted a large-scale study among late and early L2 learners of Swedish (L1 Spanish) and selected a group of most native-like sounding individuals, as picked by L1 Swedish judges. Only a small minority of late learners and a majority of early learners were perceived as L1 speakers of Swedish. Upon further examination, it was found that none of the late learners performed native-like once their L2 pronunciation was scrutinised in detail; neither did the majority of early learners. The study concluded that "nativelike ultimate attainment of a second language is, in principle, never attained by adult learners and, furthermore, is much less common among child learners than has previously been assumed" (Abrahamsson, Hyltenstam 2009: 249). A more recent study by Moyer (2014) analyses several previous case studies which feature late learners who have achieved native-like pronunciation. She observes that the "exceptional" learners have benefited from both internal (e.g. aptitude and motivation) and external factors (e.g. the amount of use and exposure to the target language). For this reason, Moyer emphasises the need for an integrated approach to studying learner factors, as no isolated factor is prevalent enough to determine the whole outcome of pronunciation learning.

To lessen the interference of learner's L1 with the target language, it has been suggested that continuous practice in L2 is necessary (e.g. Piske et al. 2001, Muñoz, Llanes 2014). For instance, Muñoz and Llanes studied two groups of Catalan-Spanish bilingual children and adults (with respective mean ages 10.4 and 22.36) over the period of three months in different English learning settings: home and abroad. The aim was to find what impact different learning settings have on the informants' L2 pronunciation and whether the effect is similar for both adults and children. Speech samples taken before and after the three month period showed that the groups of children and adults who had studied English in the country of the target language had significantly improved their L2 English pronunciation (according to raters' evaluation) in comparison to those who stayed at home. The children's speech was rated more target-like than the one of the adults, possibly because they had spent more time interacting with native speakers abroad. This observation is often referred to as Single System hypothesis (e.g. Flege et al. 1997, Guion et al. 2000), which states that the more learners speak their L1, the more noticeable the L1 accent in their L2 is.

From a pedagogical perspective, the issue of foreign accent is constantly under discussion. One solution suggested in the literature is the intelligibility principle (e.g. Levis 2005, Derwing, Munro 2005), according to which a foreign accent is acceptable, but only tolerated to the extent that it does not affect the intelligibility of speech. As long as there is a mutual understanding, it is unnecessary to demand a native-speaker-like accent from both the learner and teacher. The learning of L2

pronunciation should thus focus on aspects which cause untelligibility (e.g. the production of L2 sounds and prosody) and be instructed accordingly, as stated by Schaetzel and Low (2009), Derwing and Munro (2005), among others. A related question is which variety of English should be considered for teaching: British English or American English or some other. This is a possible cause of confusion among teachers and students alike, as pointed out by, e.g. Levis (2005), Hamid and Baldauf (2013).

Furthermore, the concept of “native speaker” has been scrutinised recently. It is noted that the concept essentially refers to an abstract entity, an ideal, while in reality native speakers can be affected by their L2 or regional varieties. To overcome the issue, some scholars (e.g. Abrahamsson, Hyltenstam 2009) “operationalize” the native speaker according to some basic criteria, e.g. exposure to one certain language since infancy, the same language is used for instruction at school and as a language of primary communication.

1.2. Prior studies on L1 Estonian interference

How Estonian as L1 affects the pronunciation of L2 English has received little attention thus far. Among the few studies is McAllister et al. (2002) which focusses on how L1 phonetic features affect the acquisition of L2 Swedish quantity distinctions and compares the results of L1 Estonian, Spanish and English speakers. The study found that the group of L1 Estonian speakers was the second most successful in achieving a native-like production and perception¹ of quantity, since the quantity distinction is phonologically relevant in Estonian, but not in English or Spanish. The other studies on how Estonian as L1 influences the pronunciation of L2 English are Mutt (1971) and Kostabi (1993). Mutt focusses on describing the characteristics of Estonian accent in L2 English in his textbook, but there is no mention of how the data was elicited. Kostabi (1993: 2) states that previous teaching materials are “[u]seful but mostly intuitive suggestions about the differences between the sounds and prosody of English and Estonian,” a fact which inspired her to carry out a systematic contrastive analysis of L1 Estonian sounds in L2 English. She examined annual tests of first year English majors at the University of Tartu and, as a result, wrote instructions for L1 Estonian learners how to improve pronunciation in L2 English. Kalk (2001) observed students in elementary and primary schools and her findings confirmed the observations made by Mutt (1971) and Kostabi (1993). Kalk also inquired teachers of English about the pronunciation training in classroom and found that not enough time is spent on it.

In sum, all previous studies on how Estonian interferes with the pronunciation of L2 English are qualitative and focus on providing detailed descriptions of L1 Estonian sounds in a sound system of L2 English. One of the aims of this paper is to measure the “foreign” accent in a target language by quantitative methods in order to provide a more objective point of comparison between different groups of learners. Thus this study is the first attempt to provide empirical and quantitative data about the effect of L1 Estonian on L2 English phonetic system.

¹ For example, when asked whether the word was produced correctly or not, Swedish informants success rate was 99.8%, Estonians' 98.1%, English' 89.2% and Spanish' 68.4%.

2. An apparent-time study: impact of internal and external factors in two different cultural situations

The questions which this study addresses are as follows: a) whether and how external factors, specifically the quality and quantity of exposure to L2 English have affected the learning of L2 pronunciation by L1 Estonian speakers; and b) does the later age of L2 learning onset correlate with a “stronger” L1 Estonian accent in L2 English?

In addition, we test two hypotheses. Hypothesis 1 states that younger adults speak L2 English with less accent than elderly L1 Estonian speakers. The assumption is that since younger generation has studied English in a different cultural situation than older informants, they have been more exposed to the target language from early age on; hence, according to Piske et al. (2001) and Flege (1991), they should show less L1 interference with their L2 sound system. The apparent-time study is implemented in order to compare the impact of a different cultural situation on the informants’ pronunciation. Hypothesis 2 states that a naturalistic setting of language learning and more frequent communication with native speakers of English results in less L1 interference in the informants’ L2 English, as pointed out by, e.g. Muñoz and Llanes (2014).

2.1. Method

The data is drawn from speech samples which were recorded during the period of 16–25 April 2014. The speech samples were analysed together with a native speaker of British English². The target of comparison was the BBC accent of English³ for two reasons: it is perceived as the standard of British English, and it is the variety which is mostly taught at Estonian schools (Kull 2006).

2.2. Informants

The total number of informants was 97 speakers of L1 Estonian (41 males, 56 females). They were divided into two groups: a younger generation, Group 1, and older generation, Group 2. Group 1 comprised 68 students from Tallinn Mustamäe College (TMG)⁴ and 4 students majoring in English at Tallinn University (mean age 20.5). Group 2 consisted of 25 middle-aged adults (mean age 53.74). More information on the background of the informants is given in Section 3.

The speech samples from TMG students were gathered during their English lessons by the first author and an assistant. Data from Group 2 was gathered in various places by the first author which explains the smaller sample size.

2.3. Tasks

The participants were presented with two tasks. Task 1 included 20 sentences, see (1)–(3) below as an example. The sentences were compiled on the basis of the textbooks by Kostabi (1993, 2004) and Mutt (1971) and included potential

² The aim was to determine how the speech samples were perceived by a native speaker who is a qualified IELTS examiner.

³ That is, the accent which used to be referred to as received pronunciation (RP).

⁴ Both majoring and minoring students were included.

pronunciation errors (e.g. *honey*, if produced with the accent, it can sound like Estonian *hani* ‘goose’). The test sentences were kept simple, avoiding complicated words and overcrowding with a single phoneme (e.g. tongue twisters such as ‘She sells seashells by the seashore’). Each sentence featured several examples of different phonemes that were pointed out by Mutt and Kostabi as potential errors, e.g. the phoneme /l/ is pronounced clear word-finally, but as dark in the BBC accent of English.

- (1) **Nelly** is a **very good swimmer**.
- (2) I had to apply **something cool** to my **wrist** after **stumbling** in the **dark room**.
- (3) **Sir**, may I suggest that **we** have **our coffee** on the **lawn**.

Task 2 was a short story of 15 sentences, see (4) below for an example. As in Task 1, the aim was to keep the test words and sentences simple. Many words which occurred in Task 1 were also used in Task 2. The aim of Task 2 was to check the pronunciation of certain sounds, such as /ŋ/ in ‘stumbling’ and /ð/ in ‘there’.

- (4) **There** was an old **man** sitting by the fireplace. **He** heard **stumbling** at the **door**. Soon entered a **tall man** who **wore ragged** clothes.

Both tasks included a written instruction in the Estonian language.

2.4. Procedure

The tasks were administered to the informants by the first author and an assistant. The informants were allowed to read the tasks once. Then they were asked to dictate the sentences while being recorded. The recording sessions were conducted individually in a quiet room. All the informants received an individual number in order to maintain their anonymity.

2.5. Analysis

Informants’ L1 accent was measured on the basis of the amount of phonemes they produced in the target language and how many of these sounds were from the L1 Estonian sound system. We counted the relative frequencies of instances where the English sound was replaced by an Estonian one. The number of phonemes in English is 35 (Roach 2000), thus the maximum number of possible sounds was 35. When a target phoneme was produced as an L1 Estonian sound up to two times, it was regarded an inconsistent L1 interference, i.e. an occasional occurrence; when at least three times, it was regarded a consistent occurrence. When no L1 sound instead of a target sound was detected, the target sound was considered to be native-like. No testing for statistical significance was conducted. When any word was substituted with another word or pronounced entirely incorrectly, it was not included in the analysis. Finally the results of Group 1 and 2 were compared.

3. Results

3.1. L1 Estonian interference in L2 English

The study provides empirical data on the characteristics of sounds produced by L1 Estonian speakers in L2 English that were noted by Mutt (1971) and Kostabi (1993). The relative frequencies of producing L2 English sounds as L1 Estonian sounds are summarised in Table 1.

Table 1. L2 English sounds produced with L1 interference (%)

English sound		Group 1	Group 2	Both groups	
1	i:	18	56	28	
2	ɪ	35	60	41	
3	u:	32	88	46	
4	ɔ:	22	68	34	
5	v	54	68	58	
6	θ	43	16	36	
7	ð	71	56	60	
8	r	Rolled	7	80	26
		Post-vocalic	93	20	74
9	k	67	72	68	
10	p	63	92	70	
11	t	13	36	20	
12	g	11	24	14	
13	b	39	64	45	
14	d	24	32	26	

The data in Table 1 shows that in the production of L2 English vowels the L1 Estonian speakers tend to retain their L1 vowel quality, i.e. the vowels are produced more close⁵ than in the BBC accent of English. For example, the long vowel sound /i:/ (sound (1) in Table 1), as in *week* in the target language, was kept identical to the L1 Estonian sound by 28% of all the informants. The short vowel sound /ɪ/ (sound (2) in Table 1) of the target language, as in *silk*, was produced much closer, i.e. identically to L1 sound, by 41% of the informants. This indicates that the informants distinguished quantity instead of quality, as in their L1. Another notable tendency was producing the long vowels /u:/ and /ɔ:/ (sounds (3) and (4), respectively in Table 1) of the target language with much stronger lip-rounding, i.e. articulating L1 sounds instead of the target language sounds that have more neutral lip-position; this happened in 46% and 34% of the informants, respectively. These tendencies, i.e. close front and lip-rounding, were also noted by Mutt (1971) and Kostabi (1993).

The production of consonant sounds by the informants also confirms the observations in Kostabi (1993) and Mutt (1971). There is a clear tendency to substitute the labio-dental fricative /v/ with the bilabial approximant /w/ or close back vowel /ɔ/ in L2 English. That is, /v/ (sound (5) in Table 1) was substituted with /w/ or /ɔ/ by 58% of the informants in the word initial position (e.g. in words such as *valley*,

⁵ The tongue is in higher position, closer to the hard palate.

vain, vest); the lenis dental fricative /ð/ (sound (7) in Table 1) was substituted with /d/ by 60% of the informants. Another significant feature which can be attributed to the L1 interference was rolling the L2 post-alveolar approximant /r/ (sound (8) in Table 1) which happened among 80% of the informants in Group 2 and among 7% in Group 1. Interestingly, /r/ was pronounced in the post-vocalic position almost without an exception by the younger generation, while in Group 2 only 20% of the informants pronounced /r/ in that position; the post-vocalic /r/ is unacceptable in the BBC accent, but common in general (or standard) American English.

A clear instance of L1 Estonian interference is the unaspiration of initial fortis plosives in L2 English. The sounds /k/, /p/, and /t/ (sounds (9), (10) and (11) in Table 1, respectively) were left unaspirated, i.e. produced as L1 Estonian sounds. For example, /p/ was produced in such a manner by 70% of the informants. Note that unaspirated initial plosives tend to be perceived as lenis plosives by native speakers of English (Roach 2000). On the other hand, initial plosives /g/, /b/, and /d/ (the respective sounds (12), (13) and (14) in Table 1) were produced as aspirated or voiced, e.g. /b/ by 45% of the informants. Voicing /g/, /b/, and /d/ deviates from the target language sounds which are simply unaspirated. This voicing of initial lenis plosives is not a characteristic of L1 Estonian, but possibly a result of overproduction in voicing, i.e. hypercorrection.

In sum, Group 1 produced less sounds with notable L1 interference than Group 2. The overall presence of L1 sounds in L2 English by group is given in Table 2. Note that the term “inconsistent” refers to the sounds which were produced as L1 sound according to manner or place of articulation up to two times, while “consistent” refers to phonemes produced as L1 Estonian sounds more than three times.

Table 2. Comparison of L1 interference by groups (%)

Group	Consistent	Inconsistent	No accent
1	11.8	21.9	66.3
2	21.5	30.5	48

Note that the relative frequency of sounds produced inconsistently with L1 interference is higher than the frequency of sounds consistently pronounced with the detectable L1 accent. This indicates that the informants are aware of the difference between the Estonian and English phonemes, but the Estonian phonemes tend to override the English ones at times, possibly due to habit.

3.2. External factors affecting L2 English pronunciation

The study compared two generations of L1 Estonian speakers in apparent-time, focussing on the quality and quantity of experience in L2 English and its interplay with age. The factors under study were the amount of formal English instruction, the number of English lessons a week, the effect of setting on English learning (i.e. the amount of time spent in the country where the target language is spoken, or having an L1 English teacher; both can improve the quality of exposure), and intensity of communication with native or non-native speakers of English.

The first factor affecting L2 pronunciation which clearly emerged was the amount of formal English instruction (see Table 3 below). The informants were asked where they had received English instruction and whether they had also studied English independently. Note that the relative frequencies in Tables 3–6 refer to the amount of L2 English phonemes produced as L1 Estonian sounds consistently, inconsistently or native-like (see also Section 2).

Table 3. The effect of formal instruction on L2 English pronunciation: the amount of L2 English phonemes produced with L1 interference (%)

Factors	Group	Consistent	Inconsistent	No accent
Kindergarten ⁶	1 (5) [†]	10.9	18.2	70.9
	2	–*	–	–
Elementary, primary, and high school ⁷	1 (33)	12.3	22.8	64.9
	2	–	–	–
Primary and high school	1 (11)	12.5	32.7	54.8
	2 (7)	26.1	31	42.9
University	1 (4)	14.2	18.5	67.3
	2 (16)	19.4	31.1	49.5
Additional independent learning	1 (19)	10.2	15.8	74
	2	–	–	–

* No informants fitted in the category, or the number of informants was too small for comparison (also applies to Tables 4–6).

[†] The number of informants in the category (also applies to Tables 4–6).

Table 3 shows that more time spent on learning the target language correlates with a more target-like sound production. In Group 1, the onset of L2 formal instruction in kindergarten results in less L1 interference, as noted in the case of 29.1% of phonemes. Learning English independently in addition to 11–12 years of formal instruction decreases the features of L1 Estonian sounds in L2 English phonemes to 26%. The same correlation holds for Group 2: the onset of L2 English learning at the age of 14–15 resulted in 42.9% of the English phonemes produced target-like. The continuation of learning English at university reduced the instances of detected L1 interference to 50.5%. Overall, Group 2 produced only 49.5% of the phonemes native-like, even despite instruction at the university level. This result is similar to the informants in Group 1 who had least formal instruction, i.e. only at primary and high school level. The number of English lessons per week was also examined, but it had no effect on the informants pronunciation within each group or between the groups.

One of the hypotheses was that a more frequent communication with L1 English speakers has a positive impact on the pronunciation of L2 English (see Hypothesis 2 above). The data in Table 4 shows that this is indeed the case: a monthly communication with native speakers of English results in less L1 Estonian accent in L2 English, i.e. 30.1% of the sounds for Group 1, and 51.4% of the sounds for Group 2. In contrast, the informants in Group 2 who had never spoken to L1 English speakers display L1 interference in 66.9% of the phonemes. Overall, Group 2 showed more signs of L1 interference than Group 1.

⁶ Up to 7-year-old children.

⁷ Elementary school: age 7–11, Primary school: age 11–16.

Table 4. The effect of frequency of communicating with L1 English speakers on the presence of L1 interference (%)

Frequency	Group	Consistent	Inconsistent	No accent
Daily	1 (9)	10.5	22.8	66.7
	2	–	–	–
Couple of times a week	1 (11)	10.9	17.7	71.4
	2	–	–	–
Couple of times a month	1 (18)	11.4	18.7	69.9
	2 (3)	18.1	33.3	48.6
Couple of times a year	1 (24)	11.7	23.9	64.4
	2 (17)	18.2	29.6	52.2
Never	1 (10)	14.9	26.5	58.6
	2 (5)	34.9	32	33.1

However, a more native-like pronunciation in L2 English was not supported by the results of those informants who reported conversing with L1 English speakers on a daily basis. They should have been the most successful group according to the hypothesis. The likely reason is a possibility that the informants interpreted ‘talking’ as ‘messaging online’, since some informants from the group noted that they had learned English online. Still, there were 4 informants in this category who produced nearly 70% of the phonemes identical to the target sounds.

The frequency of communicating in L2 English with other non-native speakers of English was also examined (see Table 5 below). The aim was to see whether it had a similar impact on the informants’ pronunciation as communication with L1 speakers of English.

Table 5. The effect of frequency of communicating with L2 speakers of English on the presence of L1 interference (%)

Frequency	Group	Consistent	Inconsistent	No accent
Daily	1 (26)	10.9	20	69.1
	2 (5)	11.4	26.9	61.7
Couple of times a week	1 (25)	12	22.9	65.1
	2	–	–	–
Couple of times a month	1 (12)	11.5	24	64.5
	2	–	–	–
Couple of times a year	1 (5)	14.3	22.3	63.4
	2 (13)	22.9	31.6	45.5
Never	1 (4)	14.3	21.4	64.3
	2 (3)	38.1	32.4	29.5

Table 5 shows that the frequency of communicating with other L2 English speakers is not relevant to Group 1, since the differences in the amount of communication do not vary much. In contrast, the results of Group 2 do show that speaking to other L2 English speakers has a positive impact on their L2 pronunciation: the occurrence of L1 Estonian sounds in their L2 English decreased as the frequency of communication increased.

To see whether the setting of L2 English learning has any influence on the informants' pronunciation (see Hypothesis 2 above), the informants were asked whether they had lived in an English-speaking country (natural setting) or had a teacher whose L1 was English. The results are shown in Table 6.

Table 6. The effect of the setting of English learning on the presence of L1 interference (%)

Factors	Group	Consistent	Inconsistent	No accent
Natural setting	1 (5)	9.1	10.3	80.6
	2	–	–	–
L1 English teacher	1 (5)	12	13.7	74.3
	2 (5)	20	31.4	48.6
Neither	1 (62)	11.9	23.3	64.8
	2 (20)	23	31.3	45.7

Table 6 shows that having an L1 English teacher or living in an English-speaking country does have a positive effect on achieving a native-like pronunciation. The informants in Group 1 who had neither L1 English teacher nor lived in a target-language country produced L1 Estonian sounds in 35.2% of the phonemes, whereas living in L1 English country diminished the L1 interference to 19.4% of the sounds in the same group. Group 2 showed a smaller difference between those who had an L1 English teacher and who did not. Overall, Group 2 produced less target-like sounds than Group 1 under similar conditions.

4. Discussion

The results of the study show that internal and external factors act together. The younger informants (Group 1) produced more native-like sounds in L2 English because of the drastic change in the learning setting of L2 English and acquisition: nowadays, L2 English learning begins earlier and there is more exposure to the target language via native speakers and media, among others, compared to the setting in which the older generation (Group 2) studied English. In a way, the two groups represent the divide between language learning and language acquisition. That is, Group 2 has mainly received formal instruction and less natural communication, hence is an example of language learning; whereas Group 1 is an example of language acquisition via natural communication.⁸

This study confirms that the external factors noted by prior studies (e.g. Piske et al. 2001, Muñoz, Llanes 2014) contribute to a more target-like pronunciation. Specifically, 60% of the informants reported watching English TV shows or films almost on a daily basis. In relation to this, it was noticed that general American accent was present in speech samples of the many younger informants. For example, Group 1 showed a tendency to substitute /ɑ:/ with the relevant shorter version of the sound which is found in general American English and which occurs when the /r/ is pronounced after the long vowel. This presence of post-vocalic /r/ (produced by 93% of young informants, 7% rolled /r/) is a clear evidence of the increased exposure to the target language, in this case US English due to the US based film

⁸ Thanks to the anonymous reviewer for pointing this out.

industry (Asu 1999, Kull 2006). The older generation featured only some instances of post-vocalic /r/, as 80% of them rolled /r/ instead. As Kull (2006) notes, they have been more exposed to British English.

The data shows a strong correlation between the onset of L2 English learning and a more native-like pronunciation of the target language. Thus the results tally with the observations in Piske et al. (2001) and Flege (1991) who noted a smaller prevalence of L1 accent in the L2 speech of the early learners. Nowadays students start learning English at the age of 8–9 (as reported by 46% of the informants), while the older age group mostly reported starting learning English at the age of 14–15. The earlier onset, as well as the exposure to natural communication, encourages a more target-like pronunciation among the younger group.

The findings of this study support the hypothesis that people with more exposure to the target language experience less interference with the L1 phonetic system. Furthermore, the older informants were more affected by the overall frequency of communicating whether with native or non-native English speakers: the informants who reported communicating with L2 speakers of English on a daily basis showed L1 interference in 38% of the phonemes, while no communication resulted in 70% of the sounds produced with an L1 Estonian accent. Therefore, even communicating to non-native speakers of L2 seems to have a positive impact on L2 pronunciation. The younger group did not show much of an impact by communicating with non-native speakers. The likely reason is that they reported generally more communication in L2 English with other speakers of L2 English than the older group, hence the amount of L1 accent within the younger group was determined by less or more exposure to L1 English speech.

The data of Group 1 also confirms the Critical Period Hypothesis to some extent. The informants of Group 1 who had received English instruction in kindergarten were the second most successful in producing native-like sounds, i.e. 71% of the phonemes were produced with no detectable L1 Estonian accent. Moyer's (2014) conclusions, which emphasise motivation as one of the influential factors, were firmly confirmed by our study: we found that the group of informants who had studied English independently in addition to formal instruction pronounced 74% of the phonemes target-like, thus having the highest result. Thus motivation is indeed an influential factor in L2 learning.

As for L1 interference, this study provides empirical evidence that the main characteristics and sounds of the L1 Estonian that are produced in L2 English speech have remained the same since Mutt (1971) and Kostabi (1993). Yet the quantitative data of this study shows a difference between the younger and older generations. The younger informants produced 66% of the phonemes identical to the sounds of the target language, which is more than the amount of the target-language sounds produced by the older group, 48%. This difference can be explained by a change in language learning setting, hence also in a completely different learning experience: the acquisition of L2 English rather than learning of L2 English. External factors such as the quality and quantity of L2 exposure thus seem to affect L2 pronunciation towards a more native-like pronunciation.

5. Conclusion

The study aimed to measure L1 Estonian interference and therefore to provide a quantitative aspect to the studies of L1 interference. It shows that the sounds produced by L1 Estonian speakers in L2 English have remained the same over time, thus supporting the observations made by Mutt (1971) and Kostabi (1993).

One of the purposes of this study was to determine how external factors, specifically the setting of L2 English learning and the quality and quantity of exposure to the target language affect the pronunciation of target language sounds. Previous studies have found evidence that exposure to the target language in naturalistic setting or to the communication with native speakers of the target language diminishes the characteristics of one's L1 sounds in their L2 speech and enhances native-like pronunciation. The findings of this study support these observations. It was found that external factors such as the frequency of communicating with the native speakers of the target language, spending time in the country of the target language, and earlier onset of language learning reduce the amount of L1 phonetic system's interference.

The comparison of two age groups clearly shows how exposure to native English influences pronunciation: older generation started their English studies at the later age and in a setting that offered less exposure to the English language. This, coupled with less frequent use of English, has made the older group more prone to the influence of L1 Estonian phonetic system. The younger generation, on the other hand, begun learning English at the earlier age in a setting which offers more exposure to the target language and natural communication, thus decreasing the influence of the L1 sound system on their L2 English. This study also highlights the most "problematic" L2 English sounds for L1 Estonian speakers, a knowledge which can be taken into account in teaching pronunciation. Yet the factors discussed in this paper are by no means exhaustive: there are many other factors that can possibly affect L2 pronunciation, such as aptitude and attitude towards language learning. Thus further studies should aim to include a wider range of factors in order to define more precisely the intersection between internal and external factors.

References

- Abrahamsson, Niclas; Hyltenstam, Kenneth 2009. Age of onset and nativelikeness in a second language: Listener perception versus linguistic scrutiny. – *Language Learning*, 59 (2), 249–306. <http://dx.doi.org/10.1111/j.1467-9922.2009.00507.x>
- Asu, Eva-Liina 1999. British or American English: A study of Estonian students' attitudes to pronunciation. – Pilvi Rajamäe (Ed.). *New Britain: The Heritage of the Past and the Challenge of the Future: Proceedings of the 2nd International Tartu Conference on British Studies Held at the University of Tartu, August 24–25, 1998*. Tartu: Tartu University Press, 22–30.
- Brown, H. Douglas 2007. *Teaching by Principles: An Interactive Approach to Language Pedagogy*. 3rd ed. White Plains, NY: Pearson Education.
- Derwing, Tracey M.; Munro, Murray J. 2005. Second language accent and pronunciation teaching: A research-based approach. – *TESOL Quarterly*, 39 (3), 379–399. <http://dx.doi.org/10.2307/3588486>
- Flege, James Emil 1991. Perception and production: The relevance of phonetic input to L2 phonological learning. – Thom Huebner, Charles A. Ferguson (Eds.). *Cross Currents*

- in Second Language Acquisition and Linguistic Theory. *Language Acquisition and Language Disorders* 2. Philadelphia: John Benjamins, 249–289. <http://dx.doi.org/10.1075/lald.2.15fle>
- Flege, James Emil; Frieda, Elaina M.; Nozava, Takeshi 1997. Amount of native-language (L1) use affects the pronunciation of an L2. – *Journal of Phonetics*, 25 (2), 169–186. http://jimflege.com/files/Flege_Frieda_L1_use_JP_97.pdf (18.2.2015). <http://dx.doi.org/10.1006/jpho.1996.0040>
- Flege, James Emil; Liu, Serena 2001. The effect of experience on adult's acquisition of a second language. – *Studies in Second Language Acquisition*, 23 (4), 527–552. http://jimflege.com/files/Flege_Liu_effect_experience_SSLA_2001.pdf (18.2.2015).
- Flege, James Emil; Birdsong, David; Bialystok, Ellen; Mack, Molly; Sung, Hyekyung; Tsukada, Kimiko 2006. Degree of foreign accent in English sentences produced by Korean children and adults. – *Journal of Phonetics*, 34 (2), 153–175. http://jimflege.com/files/Flege_Birdsong_foreign_accent_JP_20062.pdf (18.2.2015). <http://dx.doi.org/10.1016/j.wocn.2005.05.001>
- Granena, Gisela; Long, Michael H. 2013. Age of onset, length of residence, language aptitude, and ultimate L2 attainment in three linguistic domains. – *Second Language Research*, 29 (3), 311–343. <http://dx.doi.org/10.1177/0267658312461497>
- Guion, Susan G.; Flege, James Emil; Loftin, Jonathan D. 2000. The effect of L1 use on pronunciation in Quichua-Spanish bilinguals. – *Journal of Phonetics*, 28 (1), 27–42. http://jimflege.com/files/Guion_Flege_L1_use_JP_2000.pdf (18.2.2015). <http://dx.doi.org/10.1006/jpho.2000.0104>
- Hamid, M. Obaidul; Baldauf, Richard B. Jr. 2013. Second language errors and features of world Englishes. – *World Englishes*, 32 (4), 476–494. <http://dx.doi.org/10.1111/weng.12056>
- Kalk, Jana 2001. Typical Mistakes in the Pronunciation of English Sounds for the Estonian Learner. Diploma thesis. University of Tartu.
- Kostabi, Leili 1993. A Contrastive Analysis of English and Estonian Monophthongs: Teaching the Pronunciation of English Monophthongs to the Estonian Learner. MA thesis. University of Tartu.
- Kostabi, Leili 2004. Pronunciation Practice for Advanced Students. Tallinn: Koolibri.
- Kull, Rasmus 2006. Students' Pronunciation Preferences Based on an Example of the 1st Year Students of English. BA thesis. University of Tartu.
- Levis, John M. 2005. Changing contexts and shifting paradigms in pronunciation teaching. – *TESOL Quarterly*, 39 (3), 369–377. <http://dx.doi.org/10.2307/3588485>
- Marinova-Todd, Stefka H.; Marshall, Bradford D.; Snow, Catherine E. 2000. Three misconceptions about age and L2 learning. – *TESOL Quarterly*, 34 (1), 9–34. <http://www.jstor.org/stable/3588486>
- McAllister, Robert; Flege, James Emil; Piske, Thorsten 2002. The influence of L1 on the acquisition of Swedish quantity by native speakers of Spanish, English and Estonian. – *Journal of Phonetics*, 30 (2), 229–258. http://www.jimflege.com/files/McAllister_Flege_The_influence_of_JP_2002.pdf (18.2.2015). <http://dx.doi.org/10.1006/jpho.2002.0174>
- Moyer, Alene 2014. Exceptional outcomes in L2 phonology: The critical factors of learner engagement and self-regulation. – *Applied Linguistics*, 35 (4), 418–440. <http://dx.doi.org/10.1093/applin/amu012>
- Muñoz, Carmen; Llanes, Àngels 2014. Study abroad and changes in degree of foreign accent in children and adults. – *The Modern Language Journal*, 98 (1), 432–449. <http://dx.doi.org/10.1111/j.1540-4781.2014.12059.x>
- Mutt, Oleg 1971. An Introduction to English Phonetics for the Estonian Learner. 2nd ed. Tartu: Tartu State University.

- Piske, Thorsten; MacKay, Ian R. A.; Flege, James Emil 2001. Factors affecting degree of foreign accent in an L2: A review. – Journal of Phonetics, 29 (2), 191–215. http://jimflege.com/files/Piske_MacKay_factors_affecting_JP_2001.pdf (18.2.2015). <http://dx.doi.org/10.1006/jpho.2001.0134>
- Roach, Peter 2000. English Phonetics and Phonology: A Practical Course. 3rd ed. Cambridge: Cambridge University Press.
- Schaetzel, Kirsten; Low, Ee Ling 2009. Teaching Pronunciation to Adult English Language Learners. – CAELA Network Briefs. <http://www.cal.org/caelanetwork/pdfs/TeachingPronunciationWeb.pdf> (18.2.2015).
- Scovel, Thomas 1988. A Time to Speak: A Psycholinguistic Inquiry into the Critical Period for Human Speech. Rowley, MA: Newbury House.

Kristiina Ader, a graduate of Tallinn University, the department of English Studies.
Tallinn University, Narva mnt 25, 10120 Tallinn, Estonia
kristiina.ader@gmail.com

Merilin Miljan (Tallinn University, University of Tartu), lecturer in linguistics at the department of English Studies at Tallinn University, a researcher at the University of Tartu. Her research interests focus on morphosyntax in linguistic theories and psycholinguistics.
Tallinn University, Narva mnt 25, 10120 Tallinn, Estonia
merilin.miljan@ut.ee

VÄLISED TEGURID KEELEOMANDAMISEL JA EESTI KEELE KUI EMAKEELE INTERFERENTS INGLISE KEELE KUI TEISE KEELE HÄÄLDUSES

Kristiina Ader¹, Merilin Miljan^{1,2}

Tallinna Ülikool¹, Tartu Ülikool²

Artikkel keskendub teise keele hääldust mõjutavatele välistele teguritele. Eesmärgiks oli uurida, kuidas eesti keel emakeelena avaldab negatiivset mõju inglise keele kui teise keele hääldusele. Vaatluse all olid sellised varasemates uuringutes välja toodud tegurid nagu sihtkeelega kokkupuute kvaliteet ja kvantiteet ning nende koosmõju keeleõppega alustamise vanusega. Artiklis võrreldi eesti keelt emakeelena rääkivate vanemaalaste täiskasvanute inglise keele hääldust noorte täiskasvanute omaga. Saadud tulemusi võrreldi omakorda eelpool mainitud tegurite vaatepunktist, et rohkem teada saada muutunud keeleõppekeskkonna mõjust inglise keele kui teise keele hääldusele.

Uuringu tulemused tõestasid, et osalejatel, kes suhtlevad tihedamini inglise keelt emakeelena kõnelejatega või on pikemalt viibinud ingliskeelses keskkonnas, on sihtkeelelähedasem hääldus. Tugev seos leiti ka sihtkeelelähedasema häälduse ja nooremas eas inglise keele õpingutega alustamise vahel: noorema põlvkonna esindajad, kes alustasid inglise keele õpingutega enamasti algkoolis, suutsid rohkem sihtkeele häälikuid sihtkeelelähedaselt hääldada võrreldes vanema põlvkonnaga. Üks peamisi põhjuseid, miks vanem põlvkond oli rohkem avatud eesti keele interferentsile, seisneb keeleõppekeskkonnas, kus oli vähem võimalusi loomulikuks suhtluseks (ning seega keeleomandamiseks vastandina formaalsele keeleõppele), ning jätkuvas väiksemas kontaktis sihtkeelega.

Tulemustest lähtuvalt võib väita, et keeleõppes ei saa eraldada sisemisi ja välistegureid, vaid neid tuleks vaadelda koos: varajasem keeleõppe algus (sisemine tegur) on küll eeliseks uute häälikute kategooriate moodustamisel, aga välised tegurid, nagu tihe kokkupuude sihtkeelega, vähendavad sisemiste tegurite, nagu emakeele interferents, mõju.

Töö käigus võrreldi osalejate hääldust ka varasemate eesti keele hääldust inglise keeles käsitlevate tööde tulemustega ning leiti, et eesti keele aktsendi omadused on jäänud samaks. Lisaks mõõtis uuring eesti keele kui emakeele interferentsi inglise keele häälduses, tuues välja empiirilised ja kvantitatiivsed andmed eesti keele mõju kohta.

Võtmesõnad: teise keele omandamine, teise keele fonoloogia, sisemised ja välised tegurid, inglise keel, eesti keel