

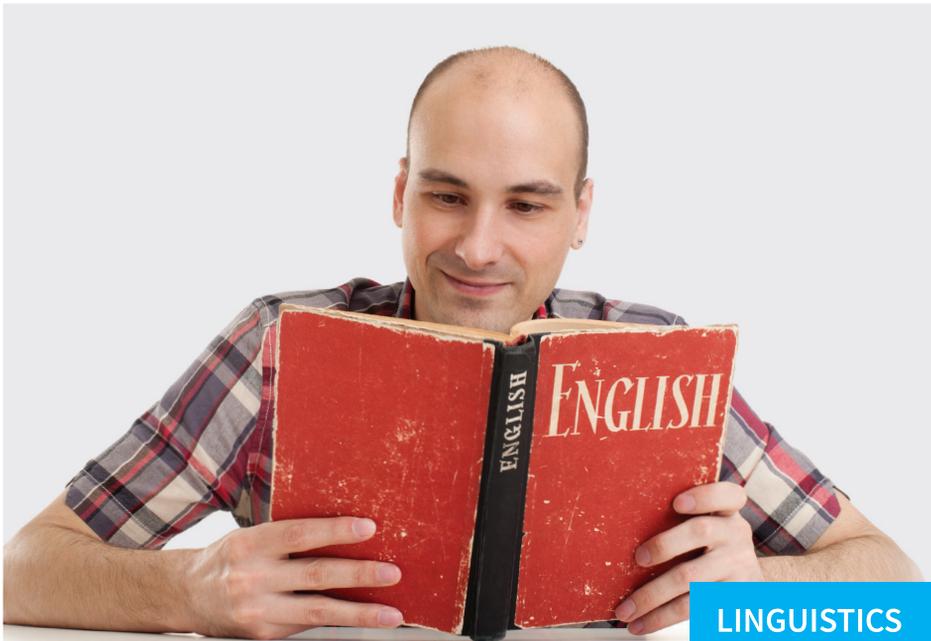
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## Variability in English across time and space



LINGUISTICS

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# The effect of previous language experience and ‘proper’ L2 input on the aspiration of English voiceless stops by Polish adult immigrants to London

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## Abstract

The study explores the effect of language experience (with emphasis on the level of L2<sup>1</sup> proficiency on arrival in the UK and the quality of L2 input) in 24 Polish adult immigrants to London who have been learning their L2 on a daily basis in natural surroundings.

Participants were divided into groups according to the abovementioned criteria. The phonetic parameter under investigation is VOT<sup>2</sup> in voiceless aspirated stops /p/, /t/ and /k/ in word-initial positions, analysed on the basis of a reading task and then measured in Praat. The qualitative data were collected by means of a structured interview.

The results suggest the importance of the level of English proficiency in L2 on arrival in the L2 country and its influence on the phonetic system developed by each learner individually. L2 pronunciation level can be developed mainly through the frequent use of the L2 in communication with native-speakers of the language.

## 1. Introduction

As English has become a language of international communication across the whole world, it is spoken by many non-native learners as their second language. The fact that Poland became a member of the European Union in 2004 created

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<sup>1</sup> Second language (in this study: English).

<sup>2</sup> Voice Onset Time.

conditions for more direct contact with English in L2 speech communities (such as Great Britain, Wales, Scotland or Ireland) for thousands of Polish people who decided to settle down in the British Isles. The wave of mass immigration to the UK started shortly after the enlargement of the EU in May 2004. The majority of Polish people went there to seek employment and better opportunities in general. However, there are also many people who decided to emigrate in order to begin or finish their studies while others initially came as tourists – but in the end they decided to stay there a bit longer.

Exploring the effect of everyday life exposure to the L2 in natural surroundings may be of interest not only from the scientific point of view but it can also be important for teaching and learning English as a second language. Polish immigrants to the UK apply different strategies and represent various approaches towards the area they live in or the language itself, which can be expected to affect the process of second language acquisition. Flege et al. (2001) point out that a wide range of factors can contribute to the effectiveness of the degree of L2 acquisition. These are both external and internal factors. The former include the age of the L2 learner, the length of residence in the L2 speaking country or the learner's gender, while the latter comprise such aspects as, for instance, motivation, L2 learning aptitude, approach to the native-speakers of a given language, exposure to L2 or the amount of L1 and L2 used in everyday life situations. Among other factors, language input and proficiency level in L2 on arrival in the L2 country seem to be the most significant (Flege 1997, 2001, 2009).

The present paper is a follow-up study to the one conducted by Matysiak (2013) in which the influence of such factors as length of residence (LoR) and the amount of L1 and L2 used on a daily basis and their effect on the use of aspiration in Polish immigrants was analysed. Results of the aforementioned study support Flege's (1997, 1999, 2001, 2009) findings that LoR as such has no particular influence on the development of L2 pronunciation skills as some other factors that occur on the way have to be taken into account as well. One of those factors was language proficiency on arrival (Flege 2001; Waniek-Klimczak 2011). As regards L2 input, it was revealed that the frequent use of English on a daily basis by Polish immigrants is not enough to acquire native-like pronunciation as the quality of L2 input was not specified (Matysiak 2013). According to Flege (1999, 2001), L2 learners are supposed to develop their L2 pronunciation skills when they mainly interact with the native-speakers of a given L2. The present follow-up study hopes to shed more light on the issue

of immigrant English by determining whether such factors as the quality of L2 input and L2 level on arrival in the UK can possibly affect the degree of L2 proficiency.

## **2. Selected factors affecting the degree of SLA**

The issue of SLA development in L2 learners has been investigated in a large number of experimental studies. Contrary to what one may think, it is not easy to determine which factors affect the overall degree of SLA as it has always been a broad and complex process. One of the possible explanations may result from the differences in design and methodology of particular studies and this “has led researchers to draw rather different conclusions about the influence that certain factors have on degree of L2 foreign accent” (Piske et al. 2001: 195). The authors mainly focus on such factors as length of residence in an L2 speaking environment (referred to as ‘LoR’), the amount of L1 and L2 use in day-to-day communication with L2 speech community and the attitude towards the L2 itself and the L2 environment. When it comes to the language input and L2 proficiency on arrival in the L2 country, it seems that those factors have obtained limited attention from numerous researchers so far. It can be explained by the fact that – on the contrary to such factors as LoR or the age of arrival (AoA), which are relatively easy to measure – it is hard to assess L2 speakers’ language proficiency at the moment of arrival in the UK, not to mention the amount of L2 use in interaction with the native-speakers of English. Flege supports that view. The author has already made some attempts to take a closer look at the two factors mentioned above.

### **2.1. L2 proficiency level on arrival in the L2 country**

In his numerous studies on the subject, Flege (1992, 1997, 1999, 2001) focuses mainly on the age of arrival in the L2 country (AoA) and suggests that L2 speakers ought to be divided into two groups: early and late learners. According to the author (1999, 2001), those L2 speakers who started learning L2 relatively early (up to the age of 15) are more likely to acquire native-like pronunciation than those who had their first contact with the second language after that period. A study by Flege, Bohn and Jang (1997) conducted among experienced and inexperienced non-native subjects revealed that the former produced English vowel sounds more accurately than the latter. Hence, it can be concluded

that the earlier one starts L2 learning, the more effective the SLA process is in such a learner. Unfortunately, it is not easy to find studies devoted to the issue of L2 proficiency level on the arrival in the UK in Polish immigrants and its influence on the overall SLA process. However, on the basis of Flege's (1997, 1999, 2001, 2009) previous work it can be assumed that those immigrants who came to the UK with relatively high level of spoken and written English are less likely to have problems with every-day life communication with the L2 community. Consequently, they tend to be more open and use more English on a daily basis. On the contrary, those who came to the UK with the basic level of L2 (or even with no previous L2 experience at all) can have problems with day-to-day interaction with the L2 community as the so-called affective filter and language shock they experience simply hinders the process of second language acquisition. A more recent study by Waniek-Klimczak (2011) conducted among proficient English learners who decided to settle down in the UK confirms the assumption that such people are at an advantage. What is more, the overall attitude towards L2 and the use of different acculturation strategies seem to be dependent on the L2 level at the very start. However, it has to be mentioned that in the abovementioned study only highly proficient L2 learners were taken into consideration.

## **2.2. Proper vs. improper L2 input**

Literature devoted to the issue of L2 input seems to confirm the hypothesis that in this case two factors can possibly contribute to the development of L2 proficiency (especially in the area of pronunciation). These are: the amount of L1 and L2 used on a daily basis and the quality of L2 input: native (referred to as a 'proper' input) vs. non-native (the so-called 'improper') input. Numerous studies conducted by Flege et al. (1997, 1999, 2001, 2009, 2011) seem to support the view that L2 speakers who receive substantial L2 input from native speakers of a given L2 are more likely to acquire native-like pronunciation than those who communicate mainly with other L1 speakers or non-native speakers' community in the L2 environment. In his studies, Flege (1997, 1999) divided immigrants into various groups on the basis of such factors as the age of arrival (early vs. late bilinguals) or the age at which the first contact with L2 took place (early vs. late learners). Those factors are related to each other and if we take those into account, previous language experience of a given L2 learner in the immigrant

society would tell us more about the ability to acquire their L2 in the so-called 'natural context', that is through day-to-day interactions with the members of the target community.

It seems that many authors have not been clear as regards the notion of 'L2 input'. The question about the importance of L2 input was very often posed by Flege (2009: 175) who understands this term as "all L2 vocal utterances the learner has heard and comprehended, including his own, regardless of whether these utterances have been produced correctly by L2 native speakers or incorrectly by other non-native speakers of L2." According to the author (*ibid.*), such a phenomenon is related to the spoken rather than the written language as "reading seems to have a negligible effect on L2 speech learning, apart from the occasional 'spelling' pronunciation of certain words that have been read but never heard."

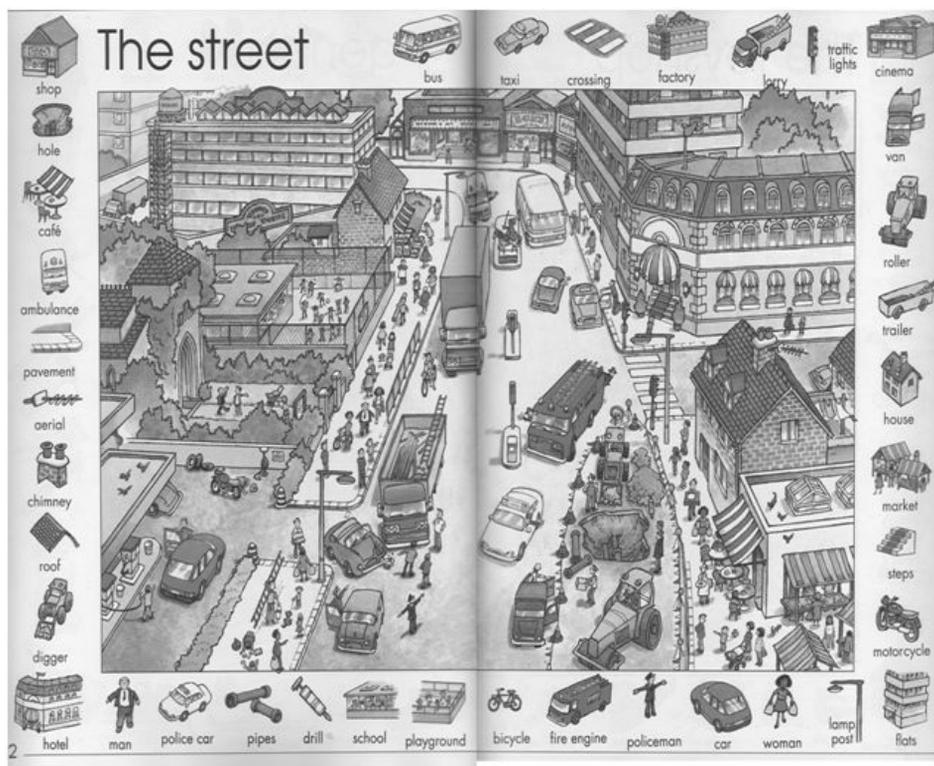
Previous studies on L1 and L2 input conducted by Flege (2009) indicate that L1 input would be more adequate than the L2 one and it would always influence L2 pronunciation in adult immigrants: both early and late learners. The reason is that when children learn L1 phonemes, they develop long-term representations of each contrastive unit and perceptually implement them into the L1 speech. Although early and late learners may receive equally proper L2 input, they differ in the frequency of exposure to such input or the use of it. It is strictly connected with the so-called 'critical period' of L2 learning (that takes place no longer than up to 15 years old). Flege (1997, 2001) reported that the immigrants who are early learners (and early bilinguals at the same time) are more likely to achieve native-like pronunciation than early or late learners who became late bilinguals. According to the aforementioned studies, there are two types of L2 input: native (proper) and non-native (improper). Many experiments conducted so far have revealed that those immigrants who interact mainly with native speakers of L2 in the L2 environment are more likely to develop their L2 pronunciation level. However, sometimes it is not easy to distinguish between 'proper' and 'improper' L2 input as after arrival in a predominantly L2 speaking area, immigrants interact either with non-native speakers or native speakers from various dialect backgrounds and they hear different accent varieties of L2. Flege (2009: 177) claims that "the L1-inspired foreign accents of the compatriots tend to match the immigrants' own foreign accents and thus tend to reinforce them". That poses many questions, among which one seems to be particularly significant – how to assess the quality of L2 input effectively?

### 3. The use of aspiration by Polish adult immigrants to London – a study

The study reported here is divided into two parts and aims at exploring the effect of previous language experience and the quality of L2 input on the use of aspiration in English. It ought to be explained that ‘previous language experience’ is understood as L2 proficiency level at the moment of arrival in the L2 country. As it is practically impossible to measure it, data had to be obtained by means of a detailed questionnaire. In the first part of the study, possible L2 level on arrival in Polish immigrants to London was assessed on the basis of respondents’ answers related to the questionnaire. As for the second part of it, the same questionnaire was analysed in order to find out more about the quantity and quality of L2 input. The study aimed at finding out whether Polish immigrants have a tendency to aspirate word-initial voiceless stops /p/,/t/ and /k/ in a given word (followed by a vowel sound) and then to investigate the possible relationship between their L2 proficiency on arrival in the UK (previous L2 experience) and the quality of L2 input (native vs. non-native) and VOT measurements for /p/,/t/ and /k/. Moreover, the study was conducted in order to investigate possible differences between participants divided into two groups on the basis of such criteria as L2 proficiency at the moment of arrival and the quality of L2 input. For the purpose of the study, T-tests for two-tailed and one-tailed independent samples were applied. The following hypotheses were formulated for the purpose of the study – first of all, previous L2 experience affects the overall level of aspiration in Polish immigrants to London. It was assumed that those immigrants who came to London with a certain level of spoken and written English would achieve better VOT results. Secondly, the quality of L2 input on a daily basis plays a significant role in successful SLA. According to the hypothesis, it was expected that those immigrants who receive more native-like input in day-to-day interaction aspirate certain sounds better than those who receive mainly non-native speech input. VOT was chosen as a phonetic parameter for two reasons. First of all, aspiration is considered to be one of the most salient features of English pronunciation. Secondly, it can be treated as an indicator of a positive attitude towards the L2 speech community (Waniek-Klimczak 2011).

### 3.1. Method

As in the previous study (Matysiak, 2014), recorded data were analysed. All participants were asked to read out 38 English words related to the picture of a busy street (Figure 1) and were recorded by the researcher. For the purpose of the study the following six words creating positive conditions for the use of longer VOT values (aspiration) in English were chosen for analysis: *cafe*, *car*, *pipes*, *police car*, *policeman* and *taxi*. For the analysis two types of variables were taken into account: two independent ones (which varied among speakers – previous L2 experience understood as L2 proficiency on arrival in the L2 country and the quality of L2 input understood as the distinction between native and non-native input) and one dependent variable (VOT measurements in English voiceless aspirated stops: /p/, /t/ and /k/).



**Fig. 1.** “The street” (adapted from “My First Thousand Words in English” by Usborne Publishing – Usborne Children’s Books)

The speakers were also given a questionnaire composed of 21 questions (Figure 2) covering such issues as age at the moment of immigrating to London/the UK (LoR), previous language experience, motivation for L2 using and learning, attitude towards L2 speech community and the language itself, amount of L1 and L2 used in everyday life situations or their plans for the future (connected with possible settlement). Participants had to read out the questions (given in English) and answer those in their L2 in the form of a structured interview. They were first familiarized with the material and then, after a short time, they were asked to read out the words and then the questions, possibly at a natural speed. The recordings were made in each speaker's place of residence (or the place of meeting suggested by each participant) between August and September 2012 in London, UK.

**QUESTIONNAIRE:**

1. When and where were you born?
2. What's your mother (first) language?
3. What's your second language?
4. Are there any other languages you speak?
5. When did you come to London? How old were you at that time?
6. Why did you decide to come here? To find a job/to study/to improve your English?
7. Did you learn English before coming to the UK? If yes, how long was that and how did you learn the language (regular school classes, special courses etc.)
8. How do you learn English in the UK? Is it important for you to improve your language skills?
9. How would you assess your English before you came here and now?
10. Do you speak more Polish or English in everyday life situations?
11. How much Polish and English do you speak at home/at work/among friends/ when you have to communicate with British people (while doing the shopping etc.)?
12. Are there more Polish or English people in the community you live in?
13. Do you read any Polish newspapers/magazines or watch TV/radio programmes or films in Polish? How often do you do that?
14. Are you interested in what happens in Poland? Do you follow the news about the country of your origin?
15. How often do you go to Poland? Do you miss your country when you are in London?
16. How important is it for you to be recognized as a person of Polish origin?
17. Do you think the fact that you are Polish helps you in everyday life situations (like looking for a job etc.) or not? Are there any stereotypes of Polish people in the UK?
18. What do you think about English itself? Do you like the language, its melody etc.?
19. Do you like spending your free time with British people or do you prefer to have contact with your Polish friends? Do you take an active part in your community's social life?
20. What was the most difficult for you when you first came here? What kind of problems did you have as regards your new job, everyday life routine etc.?
21. Do you plan to settle down in London for good? Why?

**Fig. 2.** Questionnaire used for the purpose of the study

### 3.2. Participants

The first part of the study was conducted among 24 adult Polish immigrants to London: 14 male and 10 female speakers. All of the participants were born in Poland, and their L1 is Polish. English was declared as L2 by 22 speakers, while 2 speakers claimed that English is their third language. The age of participants ranged from 20 to 35. The speakers also declared varied LoR (ranging from minimum 6 months up to 15 years). The same situation could be observed as regards previous language experience: starting from those who declared practically no contact with English before coming to the UK, ending with those who rated their proficiency level up to B2 on the arrival. The amount of L1/L2 used on the daily basis varied as well, some immigrant L2 learners stated that they used more Polish and some stated they used more English in day-to-day interactions with the L2 speech community. However, the L2 input was different among the speakers who declared more L2 used in every-day situations as some participants claimed that they communicate mainly with native speakers of English while others admitted that although they use a lot of English on a daily basis, such interaction take place mainly between them and non-native speakers of L2.

As the main objective of the study was to explore the effect of previous L2 experience among Polish adult immigrants to London and the quality of L2 input, participants were divided into different groups according to a given variable taken into consideration when grouping the results. Flege (2001) has revealed that the use of L1 has no significant influence on acquiring native-like pronunciation.

Hence, it was reasonable to divide the speakers into two groups with respect to their L2 proficiency on the arrival: those immigrants whose level ranged from B1 to B2 (n=11, Table 1) and those with the L2 level ranging from A1 to A2 (n=13, Table 2).

As regards the amount of L1 and L2 use, it was reasonable to take only those who use English more often than Polish into account and then divide them into 2 groups according to the quality of L2 input they receive: the first group comprised speakers who declared that they communicate mainly with native speakers of English on a daily basis (n=9, Table 3), the second – those who claimed that they most often interact with non-natives (n=9, Table 4).

**Table 1.** VOT values for /p/, /t/ and /k/ in the group of Polish immigrants with B1 – B2 level of L2 on the arrival (n= 11) in investigated words

Speaker/word - Vot [ms]	Café	Car	Police car	Policeman	Pipes	Taxi
aR	71.02	133.71	59.53	68.13	41.15	42.4
KK-M	72.09	78.26	65.03	46.68	42.26	42.83
NL	94.19	108.12	79.29	79.09	82.71	104.27
KH	59.39	98.3	102.43	78.39	61.09	52.94
AA	73.72	116.04	75.32	104.21	79.03	42.06
RB	98.45	110.1	41.03	36.12	80.1	44.73
PH	63.78	96.43	66.75	62.21	80.52	40.21
KK	47.13	70.97	73.82	59.61	36.04	25.14
IK	66.84	89.31	51.04	71.57	50.22	32.62
DK	44.23	81.08	38.94	53.07	62.81	37.66
MB	64.06	111.69	79.16	46.01	99.55	26.02
<b>MEAN VALUE</b>	<b>68.6</b>	<b>99.5</b>	<b>66.6</b>	<b>64.1</b>	<b>65.0</b>	<b>44.6</b>

**Table 2.** VOT values and for /p/, /t/ and /k/ in the group of Polish immigrants with A1 – A2 level of L2 on arrival (n= 13) in investigated words

Speaker/word - Vot [ms]	Café	Car	Police car	Policeman	Pipes	Taxi
aL	55.01	102.08	83.03	53.43	42.09	34.06
MJ	59.97	95.91	39.27	47.24	35.48	31.47
MP	89.36	26.17	47.01	44.32	38.81	38.17
CS	76.88	58.49	68.42	51.16	53.27	69.18
JP	59.01	38.8	22.14	28.45	21.03	11.48
MO	48.43	70.96	36.01	54.45	33.02	42.05
SN	71.45	90.54	38.02	37.01	40.63	22.01
WK	57.82	69.85	50.15	39.58	33.01	34.03
BK	62.25	66.04	59.12	50.08	23.62	48.33
PW	38.13	43.58	35.02	33.32	42.03	38.33
MK	56.83	67.19	68.21	49.01	56.88	42.25
EM	32.05	84.07	24.57	26.08	30.14	29.03
DS	56.36	45.68	23.08	22.03	20.07	26.04
<b>MEAN VALUE</b>	<b>58.7</b>	<b>66.1</b>	<b>45.7</b>	<b>41.2</b>	<b>36.2</b>	<b>35.9</b>

## The effect of previous language experience and ‘proper’ L2 input...

**Table 3.** VOT values for /p/, /t/ and /k/ in the group of Polish immigrants (n=9) who declared they receive more native-like L2 input on the daily basis interaction with L2 speech community

<b>Speaker/word - Vot [ms]</b>	<b>Café</b>	<b>Car</b>	<b>Police car</b>	<b>Policeman</b>	<b>Pipes</b>	<b>Taxi</b>
kK-M	72.09	78.26	65.03	46.68	42.26	42.83
NL	94.19	108.12	79.29	79.09	82.71	104.27
KH	59.39	98.3	102.43	78.39	61.09	52.94
AA	73.72	116.04	75.32	104.21	79.03	42.06
RB	98.45	110.1	41.03	36.12	80.1	44.73
IK	66.84	89.31	51.04	71.57	50.22	32.62
SN	71.45	90.54	38.02	37.01	40.63	22.01
BK	62.25	66.04	59.12	50.08	23.62	48.33
MK	56.83	67.19	68.21	49.01	56.88	42.25
<b>MEAN VALUE</b>	<b>72.8</b>	<b>91.5</b>	<b>64.4</b>	<b>61.4</b>	<b>57.4</b>	<b>48.0</b>

**Table 4.** VOT values for /p/, /t/ and /k/ in the group of Polish (n=9) who declared they receive more non-native L2 input on the daily basis interaction with L2 speech community

<b>Speaker/word - Vot [ms]</b>	<b>Café</b>	<b>Car</b>	<b>Police car</b>	<b>Policeman</b>	<b>Pipes</b>	<b>Taxi</b>
aR	71.02	133.71	59.53	68.13	41.15	42.4
EM	32.05	84.07	24.57	26.08	30.14	29.03
MO	48.43	70.96	36.01	54.45	33.02	42.05
MJ	59.97	95.91	39.27	47.24	35.48	31.47
MP	89.36	26.17	47.01	44.32	38.81	38.17
AL	55.01	102.08	83.03	53.43	42.09	34.06
KK	47.13	70.97	73.82	59.61	36.04	25.14
WK	57.82	69.85	50.15	39.58	33.01	34.03
DK	44.23	81.08	38.94	53.07	62.81	37.66
<b>MEAN VALUE</b>	<b>56.1</b>	<b>81.6</b>	<b>50.3</b>	<b>49.5</b>	<b>39.2</b>	<b>34.9</b>

The VOT values were measured on the basis of spectrograms and waveforms generated with Praat (2001). As the division mentioned above does not distinguish between more and less proficient L2 learners, it was reasonable to create another group. This time the immigrants with higher level of English on arrival interacting mainly in English were divided into those who are exposed to more non-native L2 input (Table 5) and more native-like L2 input (Table 6).

**Table 5.** VOT values for /p/, /t/ and /k/ in the group of Polish immigrants (n=6) with higher level of L2 on the arrival and non-native L2 input on the daily basis interaction with L2 speech community

Speaker/word - Vot [ms]	Café	Car	Police car	Policeman	Pipes	Taxi
aR	71.02	133.71	59.53	68.13	41.15	42.4
KK-M	72.09	78.26	65.03	46.68	42.26	42.83
PH	63.78	96.43	66.75	62.21	80.52	40.21
KK	47.13	70.97	73.82	59.61	36.04	25.14
DK	44.23	81.08	38.94	53.07	62.81	37.66
MB	64.06	111.69	79.16	46.01	99.55	26.02
<b>MEAN VALUE</b>	<b>60.4</b>	<b>95.4</b>	<b>63.9</b>	<b>56.0</b>	<b>60.4</b>	<b>35.7</b>

**Table 6.** VOT values for /p/, /t/ and /k/ in the group of Polish immigrants (n=6) with higher level of L2 on the arrival and native-like L2 input on the daily basis interaction with L2 speech community

Speaker/word - Vot [ms]	Café	Car	Police car	Policeman	Pipes	Taxi
nL	94.19	108.12	79.29	79.09	82.71	104.27
KH	59.39	98.3	102.43	78.39	61.09	52.94
AA	73.72	116.04	75.32	104.21	79.03	42.06
RB	98.45	110.1	41.03	36.12	80.1	44.73
IK	66.84	89.31	51.04	71.57	50.22	32.62
<b>MEAN VALUE</b>	<b>78.5</b>	<b>104.4</b>	<b>69.8</b>	<b>73.9</b>	<b>70.6</b>	<b>55.3</b>

### 3.3. Results

The results are presented by means of VOT values given in milliseconds, mean values and the results of t-tests for independent samples for each hypothesis investigated in the study. The data were analysed for particular groups on all words and then the groups were compared with respect to L2 level on arrival in the L2 country and the quality of L2 input (native vs. non-native).

#### 3.3.1. Previous L2 experience – does it really matter?

The analysis for group results for those immigrants whose L2 proficiency on the arrival was lower (Table 2) than more proficient ones (Table 1) indicates that there are statistically significant differences in 4 out of 6 instances of words in which aspiration was likely to occur. If we take a look at mean values of VOT measurements (Tables 1 and 2) for particular words it is noticeable that the more proficient group was definitely more successful in aspirating particular voiceless stops at the beginning of each word. It may result from the fact that such L2 learners are more aware of the existence of some salient features of English pronunciation and selected aspects of connected speech as they are more experienced in learning of L2.

**Table 7.** The significance level of the t-test applied to the independent samples in two groups (group 1; n= 11 and group 2; n= 13) with different L2 proficiency on arrival – ranging from A1 to A2 for the 1<sup>st</sup> group and from B1-B2 (the 2<sup>nd</sup> group). *P* value is given in the box

Café	Car	Police car	Policeman	Pipes	Taxi
0.1404831	0.0009219	0.013303	0.001386666	0.000275	0.240511

Interestingly enough, *car* turned out to be the word in which aspiration was the most audible. That would support the fact that /k/ is the strongest out of other fortis stops (aspiration in /k/ starts at above 50 milliseconds, while for /t/ and /p/ – nearly 30). However, if *car* was so strongly aspirated – what was the problem with the word *café* ( $p > 0.05$ ) in which VOT measurement are varied? One explanation that comes to mind is that this word turned out to be particularly problematic for Polish immigrants mainly because of its stress placement. Some of the participants got used to British-like stress pattern (the first syllable stressed), while others to the one typical for General American with the stress placement on the second syllable. It is commonly known that unstressed syllables are characterized by a much weaker aspiration level. Another important aspect could be the

frequency of ‘car’ – perhaps it occurs more often than ‘café’ in day-to-day communication with L2 speech community.

It also has to be mentioned that the voiceless stop /t/ turned out to be the one with the weakest level of aspiration – both in more and less proficient speakers, regardless of the L2 input quality.

All in all, the first hypothesis formulated at the beginning has to be confirmed as there is a certain relationship between the level of aspiration in English voiceless stops and the L2 proficiency on the arrival in the UK.

### 3.3.2. Is L2 input enough?

When asked about the quality of L2 input in communicating with L2 speech community, 9 participants declared that they interact mainly with native speakers of the second language (Table 3), 9 admitted that they communicate with non-native speakers of English on a daily basis (Table 4). However, the amount of previous language experience (L2 level on the arrival) was varied among those two groups. As far as the results are concerned, it is worth mentioning that statistically significant differences in VOT levels can be noticed in 2 words out of 6. These words are *café* and *pipes* – it indicates that inexperienced L2 speakers had problems with less frequent words (which corresponds to more recent studies on possible effects of word frequency conducted by Munro and Derwing 2008).

**Table 8.** The significance level of the t-test applied to the independent samples in two groups (group 1 – ‘proper’ L2 input and group 2 – ‘improper’ L2 input; in both groups n= 9) with varied L2 level on the arrival (*p* value given)

Café	Car	Police car	Policeman	Pipes	Taxi
0.025189	0.460124	0.2696227	0.261279108	0.047634	0.140399

On the basis of the results it can be assumed that the L2 input is not the crucial factor that would possibly affect aspiration in Polish immigrants. However, if we look at the mean value for VOT in Table 3 and 4, we can easily find out that the participants exposed to ‘proper’ L2 input (interaction mainly with native speakers of L2) achieved better VOT results than the group of those who communicate with the non-native speech community (receiving the so-called ‘improper’ input).

So as to confirm the hypothesis which states that the influence of L2 input ought to be correlated with L2 proficiency level on arrival, it was decided to investigate possible differences only within those speakers who assessed their L2 level as com-

municative (B1-B2) at the moment of arrival but the quality of L2 input was varied among them as some declared that they interact mainly with native speakers of L2 on a daily basis (n=5) and others – with non-native L2 speech community (n=6). There were 18 participants in total. For the purpose of investigation for possible differences in VOT within those speakers, a t-test was applied (one-tailed, independent samples). As it can be seen from the table below, a statistically significant difference can be noticed in the production of VOT in only one word, which is *café*. It may be related to some problems with the primary stress placement mentioned above. What was particularly striking here was the fact that both groups achieved similar VOT values in case of *police car* (with the initial /p/ sound as the aspirated one). Nonetheless, the weakest level of aspiration can be noticed in case of *taxi*.

**Table 9.** The significance level of the t-test applied to the independent samples in two groups (group 1; n=9 and group 2; n=9) with similar level of L2 proficiency on arrival – ranging from B1-B2 but different quality of L2 input (native vs. non-native input). *P* value is given in the box

Café	Car	Police car	Policeman	Pipes	Taxi
0.034075	0.227573	0.3113249	0.063583363	0.2229	0.068185

On the basis of the abovementioned VOT values for those speakers (Tables 5 and 6), it can be assumed that the quality of L2 input is not a factor that would influence the use of aspiration by Polish immigrants to London – both in those speakers who were more and less proficient on the arrival. Perhaps one of the reasons for such results can be the fact that all of the participants came to the UK as late-bilinguals. Flege (2009) claims that in general L2 input is less adequate in case of late-bilinguals than the L1 input they have received from the very early stage of their development. It can be noticed that even if one starts learning an L2, they receive the input of a foreign-accented teacher in their L1 country. However, after possible arrival in the L2 speaking environment, immigrants hear a variety of regional accents among native-speakers of L2, not to mention that in such metropolitan multicultural societies as London they are very often exposed to non-native speech, having no particular universal model of L2 pronunciation that they could stick to. That is why the second hypothesis formulated for the purpose of this follow-up study has to be rejected.

If we take a closer look at the results of mean values for aspiration, we can conclude that the word *car* had the highest level of aspiration, while *taxi* – the lowest in all groups. In most cases participants tend to aspirate English voiceless stops, yet there was no regular tendency in particular groups as regards VOT values for

particular stops. On the basis of the results related to the participants divided into two groups according to the L2 proficiency level on arrival in the L2 country, it can be said that only two words were not statistically significant. T-tests applied for the purpose of this study has shown that in most cases  $p < 0.05$ , which means that there are statistically significant differences between the groups divided according to the L2 level on the arrival.

The situation is slightly different when it comes to VOT values for L2 input quality measured within more and less experienced L2 learners. It can be pointed out that less experienced participants have certain problems with the production of less frequently used words such as *café* or *pipes*. Many inexperienced immigrants had a tendency to mispronounce those words as they were not familiar with them.

Consequently, the hypothesis related to L2 proficiency on arrival and formulated at the beginning has to be confirmed. Unfortunately, the second hypothesis that was formulated with reference to the quality of L2 input has to be rejected. There is a need for a follow-up study investigating some other factors that could possibly affect the degree of the L2 acquisition.

## 4. Discussion

Interpretation of the results and comparing those with participants' responses obtained by means of the questionnaire used in this study suggest that previous language experience (understood as L2 proficiency on arrival) is one of the factors that possibly influences L2 pronunciation level in Polish immigrants to the UK. Such findings correspond to the previous research by Flege (1992, 1997, 1999, 2001, 2009, 2011). As regards L2 input, it was pointed out that native-speakers are a much better source of the so-called 'proper input', at least as regards pronunciation (Flege et. al 2001). Consequently, if an L1 speaker lacks such input in day-to-day interaction with members of the L2 speech community, there is a high probability that the process of L2 acquisition is not very dynamic and we cannot talk about the development of language or pronunciation skills. However, VOT measurements and the overall analysis of the qualitative data (in the form of a questionnaire) obtained for the purpose of the present study reveal that the quality of L2 input is not necessarily the most decisive factor in L2 acquisition as SLA is an extremely complex process in which many different aspects ought to be systematically explored and analysed. There are many reasons for such findings. One of the most important seems to be the fact that although some respondents

are early learners of L2, they acquired a certain L2 level in their country of origin and they arrived in the UK as adults – that classifies them as late bilinguals. Even if some of them declare that they interact mainly with native-speakers of English on a daily basis, it is extremely difficult to assess the quality of such input as native-like speech is often characterized by the presence of different regional accent varieties. Many native-speakers have various dialect backgrounds and hence immigrants hear more than one universal model of L2 pronunciation.

At this point it should be said that the present study has its limitations. To begin with, the relatively small amount of participants who agreed to take part in the recordings (24 speakers in total) may not be sufficient to investigate some regular features or patterns of pronunciation typical of Polish immigrants to London as a larger group. A bigger sample would be of use in this case.

Secondly, the design of the study is far from perfect as, for instance, the words connected with the picture of a busy street were given on a single sheet of paper – hence, some speakers made practically no pauses between given words and that could affect the quality of VOT. Although the words chosen for the purpose of the study create contexts for aspiration, word-stress (*policeman* or *police car* would have weaker aspiration as the main stress falls on the second syllable in each of those words) or the tempo of reading (more careful reading creates better conditions for aspiration) could significantly distort aspiration level.

Thirdly, some of the investigated words were far more frequent than others, which means that the participants were familiar with such words as *car* or *taxi* as they could often hear them and consequently, it could affect their performances to some extent. As regards the number of words investigated, it can be seen that there are limited contexts in which aspiration could be observed (i.e. there was just one word with /t/ as the initial sound). Further studies are needed to establish the pattern of VOT in voiceless aspirated stops /p/, /t/ and /k/ in broader contexts (on the basis of participants’ responses obtained from the questionnaire).

Another important aspect is that some answers recorded in the form of a structured interview were imprecise – it was particularly hard to determine the exact time specification or the quality of previous language experience, i.e. how long they have been learning English, when they started (early vs. late learners), where it was (Poland or an English-speaking country) and were those classes regular or not (intensity of such classes/ courses ought to be pointed out). Perhaps the language exposure turned out to be less substantial than the speakers declared in questionnaire. On the basis of such observations, the following question arises: how to measure or

– at least – assess the quality of L2 input objectively? Perhaps longitudinal comparative studies ought to be conducted to take a closer look at this factor, but still there is no effective method of investigating such aspects as previous L2 experience or deciding whether the amount of L2 input is proper or not. As a result, researchers are forced to rely on participants' responses which can be unreliable because of the lack of precision or the ability of sensible assessment. With such a high level of variability among the participants, it would be reasonable to investigate possible factors affecting SLA on the basis of individual differences in the speakers.

Finally, it might be helpful to conduct a kind of comparative analysis exploring the use of aspiration in voiceless stops in two languages: English (L2, non-native language) and Polish (L1, native language). Thanks to such studies the effect of L1 on L2 pronunciation could be explored in detail. I believe it might be a good point of reference for a possible follow-up study or further studies on this aspect in general as there is still a need for filling the gap in literature devoted to the issue of immigrant English.

## 5. Conclusions

Regardless of the limited number of samples (either the amount of participants or investigated words) and a high level of variability in VOT measurements, it can be said that the results of the aforementioned study offer a number of findings which are worth investigating in further studies on the aspect of SLA and immigrant English in general.

The first finding suggests that L2 proficiency level on arrival in the L2-speaking area can be treated as a determiner of success in the acquisition of L2 pronunciation and can contribute to the overall level of L2 proficiency. This would confirm the previous findings (Flege 2009, 2011) and highlight the importance of the previous L2 experience on arrival in the L2 country.

Nevertheless, the study revealed that there are practically no statistically significant differences between participants as regards the quality of L2 input. As the previous studies on this issue (i.e. Flege 2001, 2009) suggest that language input could possibly refine L2 pronunciation, it cannot be confirmed in case of the present study. The results reported above suggest that there is a need to examine L2 input and its quality thoroughly – this time in combination with other factors (such as length of residence, age of arrival or acculturation strategy) characteristic in case of individual speakers.

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LINGUISTICS

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