Konin Language Studies
Faculty of Philology, State University of Applied Sciences in Konin, Poland
KSJ 4 (2). 2016. 127-149
http://ksj.pwsz.konin.edu.pl
*doi: 10.30438/ksj.2016.4.2.3*

# *Influence of formal instruction in English on the acquisition of Czech learners' production of English phonemes*

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Abstract

Pronunciation is a crucial component of communicative competence in a foreign language and there are many factors that affect pronunciation learning in general and segmental features in particular. This study investigates the extent to which selected variables related to formal instruction (i.e., the length of formal instruction in years, the number of English native speaker teachers the learners experienced) correlate with the Czech learners' production of English phonemes on entry to the university. Data elicitation instruments included a questionnaire and two reading aloud tests. The research cohort consisted of 112 Czech students who entered English language education programs at three Czech universities in autumn 2013. The correlations between the total pronunciation score and the length of formal instruction in English and the number of English native-speaker teachers were not statistically significant.

*Keywords:* formal instruction; segmental features; length of formal English language learning; native speaker teachers

## 1. Introduction

English has recently become the language of international communication, that is the lingua franca of the modern world. For a minority of its speakers it is a native language, for a larger population English functions as a second language (L2), but the most substantial cohort of people uses English as a foreign language (FL). Thus, learners of an FL learn a non-native language in the environment of one's native language unlike learners of an L2 who learn a non-native language in the environment in which that language is spoken (Gass & Selinker, 2008). The language learning in the Czech Republic (CR) matches the characteristics of FL learning proposed by Cameron (2001): learners obtain very little experience of the language outside the classroom and encounter the language through several hours of teaching in a school week. Access to the community of the native-speaking English language users is very limited in formal instruction unless electronic media are used. Another difference between the L2 and FL environment is the setting of language learning. While in the L2 environment learning may or may not take place in a classroom setting, in the FL environment such learning most commonly happens in the classroom. For some learners, however, the learning of an FL is restricted to the classroom, since the opportunities for real-life communication in English are limited. Learners have to be active in searching for those opportunities themselves. Obviously, formal instruction is essential in an FL context. Recently, there has been a trend in Europe to decrease the starting age of formal instruction (Mourão & Lourenço, 2015). Similarly, in the CR, the compulsory English language education starts in grade three (learners aged nine) but there are many educational institutions providing FL education to children younger than nine (Černá, 2015). The question is, however, whether an earlier starting age of formal instruction leads to higher FL attainment.

The present study narrows down its focus to the relationship between the length of formal instruction in English and exposure to native English in formal educational setting, on the one hand, and the Czech learners' production of English phonemes, on the other. It is part of a large-scale project, called *Aspects of English Language Acquisition of Czech Students at the Onset of Teacher Education,* going on from 2013 to 2015. Its main aims were: (a) to identify external and internal factors influencing the process of learning English as an FL by Czech learners, and (b) to diagnose the achieved level of communicative competence as manifested in speaking. Apart from these global aims, it strove to achieve three partial aims: (a) to create a corpus of learner spoken English and make it available for further research use, (b) to undertake an analysis of selected grammatical, discourse and pronunciation features, and (c) to obtain and analyze quantitative and qualitative data regarding individual students' learning histories covering the period from the early childhood to the university entrance examination.

## 2. Targets of English pronunciation learning according to CEFR and the Czech curricular documents

A new system of curricular documents, that is *Framework education programs for pre-primary, primary, lower- and upper-secondary education*, started to be implemented in the first decade of the 21st century (Greger & Walterová, 2007). In the field of FL, the curricular reform brought two important changes: (a) the onset of the obligatory instruction in an FL was moved to grade three of primary school (eight/nine years of age), and (b) English is now prioritized as the first FL from grade three but learners can choose another FL in grade eight. As a consequence, nowadays every upper-secondary graduate (eighteen/nineteen years of age) should have experienced eleven years of formal education in English. Prior to the reform, the length of the school-based learning of English varied considerably since learners did not necessarily choose it as the first FL (the case of our study).

The current revised version of the *Framework education program for basic education* (*Framework Education Program...*, 2013) defines general educational objectives and content of primary and lower-secondary education, as well as expected outcomes of individual educational areas. One of the areas, *Language and communication through language*, includes three compulsory subjects: Czech language and literature, foreign language (i.e., English), and another foreign language. The expected outcomes of FL learning are formulated with respect to the *Common European framework of reference for languages* (CEFR, Council of Europe, 2001). Learners are expected to achieve the A1 level of communicative competence according to the CEFR at the end of grade five, the A2 level at the end of grade nine (*Framework Education Program...*, 2013), and the B1 or B2 levels when graduating from various types of upper-secondary schools (*Framework education program for secondary general education (grammar schools) Framework Education Program...*, 2007). Communicative competence, as defined in the CEFR (Council of Europe, 2001), has the following components: "linguistic competences, sociolinguistic competences, and pragmatic competences" (p. 108). Phonological competence, a constituent part of linguistic competences, involves (Council of Europe, 2001, pp. 116-117):

> (...) a knowledge of, and skill in the perception and production of: the sound-units (*phonemes*) of the language and their realization in particular contexts (*allophones*); the phonetic features which distinguish phonemes (*distinctive features*, e.g., voicing, rounding, nasality, plosion); the phonetic composition of words (*syllable structure*, the sequence of phonemes, word stress, word tones); sentence phonetics (*prosody*); sentence stress and rhythm; intonation; phonetic reduction: vowel reduction, strong and weak forms, assimilation, elision.

In spite of the availability of the definition, the expected levels of phonological control presented in the CEFR (Council of Europe, 2001) are described with no or little reference to phonological competence. While levels A1, A2, and B1 are defined in terms of intelligibility, the specification of B2 level is descriptive, and C1 and C2 levels are formulated as *can do* statements (Council of Europe, 2001, p. 117):

> PHONOLOGICAL CONTROL (...)
> *B2* Has acquired a clear, natural, pronunciation and intonation.
> *B1* Pronunciation is clearly intelligible even if a foreign accent is sometimes evident and occasional mispronunciations occur.
> *A2* Pronunciation is generally clear enough to be understood despite a noticeable foreign accent, but conversational partners will need to ask for repetition from time to time.
> *A1* Pronunciation of a very limited repertoire of learnt words and phrases can be understood with some effort by native speakers used to dealing with speakers of his/her language group.

The Czech curricular documents for primary and lower-secondary education (*Framework Education Program...*, 2013) do not refer to phonological competence either. The only skills-related reference to pronunciation is found in the formulation of the expected outcomes concerning listening comprehension. A1 learners are expected to understand the teacher's simple instructions, questions, sentences, and texts if they are delivered slowly with distinctive pronunciation. Under the same conditions, A2 learners should comprehend simple listening texts, topic-related monologues, or conversations (*Framework Education Program...*, 2013). Regarding the pronunciation system, the requirements are sometimes rather vague, which is a serious shortcoming. A1 learners are expected to learn phonetic symbols (passively), to develop basic phonological habits, and to realize the relationship between the spoken and the written form of words. Learners at the A2 level should acquire intelligible enough pronunciation and an ability to differentiate elements of the phonological system of a language, stress in words and utterances, and intonation patterns (*Framework Education Program...*, 2013). Grammar school learners, according to the *Framework Education Program...*, should aim at the B2 level (2007). In spoken interaction they are expected to "communicate fluently on abstract as well as specific topics in less common or specialized situations, respecting the rules of pronunciation" (*Framework Education Program...*, 2007, p. 17). This is the only mention of pronunciation among the expected skills-related outcomes. In terms of phonetics, the targets involve the mastering of "the phonetic structure of a word, the phonetic aspect of a sentence, phonetic reduction, phonetic features" (*Framework Education Program...*, 2007, p. 17).

To summarize, the *Framework education programs* at all levels should provide schools with frameworks for the design of their own school education

programs. Schools in the CR are autonomous institutions; they specify their unique ways of achieving the given objectives respecting their own resources. In terms of English pronunciation, this seems to be a strenuous task, since teachers – curriculum designers – will not find non-specific formulations like "to develop basic phonological habits" (*Framework Education Program...*, 2013, p. 23) too helpful. Furthermore, there is not much agreement between the CEFR (Council of Europe, 2001) and the curricular documents (*Framework Education Program...*, 2013; *Framework Education Program...*, 2007) regarding the level of phonological competence which learners should achieve at the end of primary, lower-, and upper-secondary education. As a consequence, teachers may experience difficulties when thinking about the targets of pronunciation instruction. Since schools at all levels are responsible for the design and implementation of their own school education programs, they also have autonomy to decide which methods, techniques, textbooks and other materials to use and in what way. Presumably, there may be vast differences in the outcomes of English language (pronunciation) teaching and learning among schools of the same kind.

## 3. Issues in pronunciation teaching and learning

### 3.1. Selected aspects of formal instruction in relation to pronunciation

There are numerous factors which might influence pronunciation learning under the conditions of formal instruction. The most obvious learner-related factors include age (i.e., the onset of learning English), learners' mother tongue, the length and frequency of FL (prior) instruction, or/and exposure to native and non-native input in English. In this study, we will only focus upon two of them, that is the length of formal instruction in English in years, the number of native speaker (NS) teachers experienced during the years of formal instruction, and their likely relationship with the acquisition of segmental pronunciation features in question.

#### 3.1.1. The length of formal instruction in English in relation to pronunciation acquisition

The length of formal instruction in English in the CR for the participants of this study varied considerably for the reasons discussed in section 2; it ranged from 6 to 13 years. It is vital to emphasize that the beginning of formal instruction, however, was not the first encounter with English for some of the subjects. Nevertheless, as some students started learning English at the age of six, according to some research findings (Brown, 2000), they are supposed to achieve a higher level of pronunciation. This is supported by a number of studies. The relationship

between the beginning of L2 learning and the successful acquisition of L2 pronunciation lies in the heart of the Critical Period Hypothesis (CPH) (Lenneberg, 1967, as cited in Harley, 1986). Penfield and Roberts (1959, as cited in Harley, 1986), the proponents of the so-called brain plasticity hypothesis, attribute the diminished ability to learn an L2 to the loss of brain plasticity between nine and twelve years of age. They also maintain that children should ideally start learning an L2 before the age of nine and be exposed to the direct method of teaching in a formal setting. Lenneberg (1967, as cited in Harley, 1986) claims that learners at about thirteen years of age arrive at the end of the critical period and its closure is related to "a loss of adaptability and inability for reorganization in the brain" (p. 5). Consequently, post-puberty learners might find it rather difficult to get rid of their foreign accent. As he explains "[a]utomatic acquisition from mere exposure to a given language seems to disappear [after puberty], and foreign languages have to be taught and learned through a conscious and labored effort. Foreign accents cannot be overcome easily after puberty (...)" (Lenneberg, 1967, as cited in Hummel, 2014, pp. 170-171). Ellis (1994) asserts that there are findings concerning the effects of age on L2 phonology proficiency in educational settings drawing on study results by Snow and Hoefnagel-Hőhle (1978, as cited in Ellis, 1994). They arrive at the conclusion that "younger learners do better than older ones (although it may also reflect psycholinguistic factors)" (p. xx). However, not all specialists adhere to the CPH to explain the differences between the learners' mother tongue and L2. Moyer (2013) points out that some proficient adult L2 learners achieve native-like control in all components of linguistic competence but phonology, which can be explained as either "a social-psychological problem, or it is a proof of a predetermined biological limit on acquiring sound categories and articulation patterns" (p. 62). Flege (1995, as cited in Hummel, 2014), the proponent of the *speech learning model* (SLM), suggests that "mechanisms underlying the L1 acquisition remain intact in L2 learning but that a number of factors affect L2 learning success (...) quality and quantity of L2 input, and continued exposure to the L1 (...)" (pp. 172-173).

The age factor was also investigated in the Czech educational context, unfortunately without specific attention to pronunciation. Najvar and Hanušová (2010) searched for correlations between the age of onset of FL education, elicited by means of a questionnaire, and the results of a university entrance test. The test included the following sections: grammar, syntax, spelling, vocabulary, and reading comprehension, all of them at the B2 level (Najvar & Hanušová, 2010). The authors did not find significant differences between groups of learners with a different age at the onset of FL learning and concluded that the starting age was not a major factor in FLL. They perceived FL learning as a complex process influenced by other variables, such as learners' personal characteristics,

gender, age, the profile of the school, its region, the number of lessons per week, the number of teachers that a student was taught by, teachers' qualifications, teaching methods and techniques, etc. (Najvar & Hanušová, 2010). In another study, Najvar (2010) explored the effects of an early start on test results of learners in grade eight of lower-secondary school. The results did not reveal any statistically significant effects. In spite of the inevitable differences in the research design of the two studies, the present study in a way complements the work by Najvar and Hanušová (2010), which was done in the same educational context not so long ago, since it provides the missing pronunciation-related data.

### 3.1.2. Relationship between exposure to native-speaker English(es) and pronunciation acquisition

A major factor to be considered is the quality of input that learners receive. Firstly, it will be considered in general and, secondly, in relation to the Czech educational setting. Learners of English are exposed to different kinds of input, modified or authentic (Ellis, 1997) in a variety of learning contexts. This study focuses on formal FL instruction, in which the teacher is the main source of target language input. Ellis (2008) summarizes the outcomes of studies investigating teacher talk and reports that the teacher in L2 classrooms "takes up about two thirds of the total talking time" (p. 795). This is a substantial part of the lesson and, therefore, teachers should try to use L2 as much as possible in order to maximize target language input. This opinion is supported by Turnball and Arnett's survey of the research on the teacher's use of L1 (2002, in Ellis, 2008), in which they noted a number of studies reporting "a direct correlation between achievement and teacher use of the target language" (pp. 801-802). Although achievement is not specified anyhow, presumably, it also includes phonological competence, as defined in the CEFR (Council of Europe, 2001). As regards the Czech the educational context, the use of English and Czech by non-native speaker teachers was investigated by Najvar, Janík, & Šebestová (2013). The team analyzed 89 videoed lessons. The use of the two languages was balanced, if operationalized in terms of time, but, most importantly, the authors reported a great difference in the amount of the mother tongue and the target language used by individual teachers. There may be multiple reasons that account for the difference, including, for example, teachers' professional philosophy and beliefs about FL instruction and also their varying levels of communicative competence in English. This is suggested by Betáková (2010), who describes problems that some Czech teachers of English face when they attempt to conduct a lesson in the target language: "They can explain how to form them [basic structures] but they are not able to use them naturally in speech" (p. 49). Apart from grammar,

pronunciation is perhaps even more challenging for non-native speaker teachers to cope with. Regarding pronunciation instruction, Brinton (2012) asserts that teachers are expected to have a knowledge base for teaching pronunciation and also "a high degree of intelligibility in the local pronunciation standard (e.g., British, American, or another regional variety of English)" and to "provide an appropriate, inspirational model for their students" (p. 248). In the CR, a greater number of upper-secondary school teachers typically achieve native-like or excellent pronunciation compared to primary and lower-secondary teachers (Ivanová, 2011). Thus, they are likely to provide an appropriate pronunciation model for their students if they use the target language. With reference to the considerable difference in individual teachers' use of the target language (Najvar et al., 2013), we may assume, on the one hand, that some non-native speaker teachers do not provide such a model simply because they do not speak English at all or they do but very little. On the other hand, some teachers may provide a model that would be close to that of a NS teacher. Communicative competence in English is the main asset which NS teachers bring to FL classrooms. They are potentially a source of extensive input, which, according to the conclusions of Turnball and Arnett (2002, as cited in Ellis, 2008), leads to higher achievement. There are studies which stress a vital role of *native-like input*, its *type* (written or spoken), *quality* (standard varieties vs. regional ones), *continuity* and *regularity*, but in an L2 informal setting (e.g., Flege, 2012, as cited in Hummel, 2014).

Unfortunately, to the best of our knowledge, there are no comprehensive studies dealing solely with the impact of the input from NS or non-native speaker (NNS) teachers under the conditions of formal instruction in the CR on the improvement of learners' pronunciation in general and segmental features in particular. Therefore, we decided to explore the effect of the selected variables of formal education on the Czech learners' production of English phonemes.

### 3.2. Focus on segmental pronunciation features

The ongoing discussion whether segmental features, that is pronunciation accuracy, or suprasegmental ones contribute more to accentedness or to comprehensibility and intelligibility of the L2 learner's speech has not been resolved yet. Moyer (2013) asserts that it is a common perception that "sounding foreign is primarily a matter of segmental accuracy" (p. 57). Among the studies Moyer (2013) refers to is the one conducted by Derwing and Rossiter (2002, as cited in Moyer, 2013), who state that 55 per cent of foreign accent is due to the inappropriate pronunciation of segmental features in their research of 100 adult L2 learners with various L1 backgrounds. In a different study, Moyer (2004) found that 40% of the study participants relate their mispronunciations to segmentals,

while 13% to intonation. On the other hand, there are studies whose results produced evidence for the key importance of prosodic features (Anderson-Hsieh, Johson, & Koehler, 1992; Moyer, 1999, as cited in Moyer, 2013). Similarly, Goh and Burns (2012) quote studies which view prosodic features as having "a greater impact on the intelligibility of learners' speech production than clear articulation of (...) phonemes" (p. 60).

Let us enrich this inconclusive picture by research conducted in the Czech context. Ivanová (2011) inspected the extent of accentedness in the speech of 66 Czech first-year university students studying English in a pre-service teacher education program in relation to the causes of this accentedness (i.e., word stress, sentence stress, rhythm, intonation, individual phonemes). All the students were at the B2 level according to the CEFR (Council of Europe, 2001). On average the students' accent in reading aloud was ranked as medium (3.57) on a five-point scale. The assessors (i.e., three Czech university teachers and one British NS university teacher) identified the following causes of the Czech accent from the most to the least prominent ones: rhythm, intonation, individual phonemes, word stress, and sentence stress. Interestingly, the British NS assessor chose the mispronunciations of individual phonemes as the most problematic ones, while NNS assessors selected them as the third parameter. Further on, Ivanová (2011) compared reading aloud without and with prior pronunciation practice, which revealed that prior practice helped students to decrease inaccurate rhythm and sentence stress, but both intonation and individual phonemes deteriorated by 2% and word stress by 48.3%. As a result, we might hypothesize that intonation, individual phonemes and word stress are more difficult to improve as they fossilize in the students' interlanguage.

## 4. Research

The quantitative study investigated two variables of formal instruction, that is the length of FL learning in years and the number of NS teachers, in relation to the total pronunciation score (49 items), which consists of two scores. Score A (36 items) reflected seven pre-selected segmental features: the front open vowel ash, the weak central mid vowel (schwa), the voiced and voiceless dental fricatives, the bilabial approximant /w/, the velar nasal, and the pronunciation of word-final voiced consonants. These features were identified as problematic for Czech learners by Černá, Urbanová and Vít (2011), Volín and Poesová (2008), and Nádraská (2013). Score B (13 items) reflected Czech learners' mispronunciations which were not identified as problematic to Czech learners prior to actual assessment but were taken on board ad hoc as they form 26.5 per cent of 49 items.

### 4.1. Research questions

The purpose of the study was to find answers to the following research questions:

1. What is the correlation between the pronunciation score and the length of formal instruction in years?
2. What is the relationship between the total pronunciation score and the number of NS teachers who taught each respondent during the years of formal instruction?

### 4.2. Participants

The participants of the research were Czech students in English language teacher education study programs at the Faculty of Education in České Budějovice, the Faculty of Education in Olomouc and the Faculty of Arts and Philosophy in Pardubice, who started the first year in October 2013. The subjects constituted a unique cohort of learners, since they had started their FL education prior to the curricular reform and, consequently, differed in the length of formal instruction of English compared to upcoming cohorts. The cohort included 112 participants, 67% females, 33% males; the average age was 20.2 years. 43% of the students had experienced contact with English in their pre-school age. The data was collected at the very beginning of their university studies in October and November 2013. In response to one of the items in the questionnaire, the participants self-assessed their level of communicative competence in English according to the CEFR (Council of Europe, 2001) in the following way: B1 – 29%, B2 – 53%, and C1 – 12%.

### 4.3. Research instruments

The data elicitation instruments included a questionnaire and two reading-aloud tasks. They are described in more detail below.

#### 4.3.1. Questionnaire

The questionnaire was designed to elicit quantitative data about individual biographies. It allowed gathering information about many aspects of the participants' FL learning experience covering the period between early childhood and the onset of university education. It consisted of 62 items, both open-ended and closed. Closed items, including dichotomic and multiple-choice items as well as Likert-type scales were predominant. For the purpose of the study, only answers to the questions which elicited information about the length of formal instruction and the number of NS teachers will be analyzed and discussed.

### 4.3.2. Reading-aloud tasks

The diagnostic passage consisted of 153 words, out of which 98 were tokens, that is different words (see the appendix). Although the participants were asked to read the whole text, the pronunciation analysis was concerned only with the pronunciation features present in 24 words, which were identical with the words in the second reading aloud task. Some words, such as *had* or *that*, however, had to be read as weak forms of function words (Roach, 2009) in the diagnostic passage unlike their realizations as individual words in the second reading aloud task. The second task drew on a list of 24 words which were taken from the diagnostic passage, that is: *lamp*, *watch*, *bag*, *had*, *locking*, *away*, *again*, *long*, *that*, *bag*, *everything*, *suspected*, *away*, *threw*, *twenty*, *planned*, *thought*, *they*, *bed*, *waited*, *again*, *everything*, *suspected*, and *then*. Out of 24 words 19 were tokens, so the words *bag*, *away*, *again*, *everything* and *suspected* were read twice. Both reading aloud tasks were designed with the aim of enabling comparative analysis of the pronunciation of 7 segmentals in the context of a text and in isolation.

#### 4.3.2.1. Control corpus

The British and American standards as presented in Wells' (2008) Longman Pronunciation Dictionary served as a point of reference for the assessor for the following reasons. First, the dictionary provides all acceptable standard pronunciations of the same word in two pronunciation varieties (BBC English and General American), e.g., "again /əˈgen/ -preference polls, British English: -ˈgen 80%, -ˈgeɪn 20%. Many British English speakers use both pronunciations. American English - ˈgen 97%, -ˈgeɪn 3%" (Wells, 2008). Second, it also provides non-standard pronunciation forms which should not be used by NNS, e.g., in the case of *psalm*, it warns the learners not to pronounce it as /sɑːlm/ or /sɒlm/ (Wells, 2008). Third, to the best of our knowledge, it is the only existing research-based pronunciation dictionary unlike the 17th edition of Daniel Jones's *English pronouncing dictionary* (2006). Finally, it comprises model sound files of BBC English and General American pronunciations of a given word.

#### 4.3.2.2. Assessor

The analysis was carried out using auditory assessment by one NNS university teacher with 24-year experience of teaching phonetics and phonology. Her mother tongue was Czech and so she was aware of the pronunciation problems of Czech learners. Furthermore, she also conducted research projects in this field for MA and PhD dissertations. While rating the recorded performances, she

was not the students' regular teacher. She listened to each student's performance several times at each of two rating periods and the same rater assessed the same sample of recordings after a brief period of time in a rearranged order, as suggested by Bachman (2004) with the intra-rater reliability of $\alpha = 0.63$.

#### 4.3.2.3. Assessment procedure

Prior to being recorded, each reader was instructed to study the diagnostic passage and the wordlist for a minute in this order. They were also asked to read the words on the list one by one, including the numbers at the beginning of each line to help the assessor's orientation in the recording. In order to achieve good-quality recordings, *The Sound Forge Pro 10* software was used. This software allowed multiple listenings of a chosen sequence and slowing down the selected sequences of each recording. Pronunciation assessment drew on dichotomous data, since the individual pronunciation features were scored right-wrong (Bachman, 2004). This means each correctly pronounced feature was assigned one point, while each incorrectly enunciated feature was classified as zero in both scores A and B. Score A (see section 5.1) represents 36 items (see Table 3), i.e., maximum = 36 points, and score B (see section 5.2) represents another 13 items, i.e., maximum = 13 points. In some cases, the pronunciation of one word, e.g., *bag*, represented two test items: the front open vowel ash and the word-final voiced consonant; therefore, their correct realizations was awarded with 2 points. Sometimes, however, one word, e.g., *planned*, represented even 3 test items: the front open vowel ash and the word-final voiced consonant – 2 test items in score A, the pronunciation of the letter – e- as in the word *planet* – 1 test item in score B. The pronunciation scores A and B per individual student ($N = 112$) were added in order to achieve a total score per each student (see Table 4 below). Afterwards this final score was correlated with two variables, the length of FL learning in years and the number of NS teachers.

## 5. Results of the study

The results of pronunciation analyses are provided in sections 5.1 through 5.3. The results dealing with two variables of formal instruction are given in section 5.4, and in section 5.5 the correlations between the total pronunciation score, and the length of formal instruction and the number of NS teachers are considered.

### 5.1. Pronunciation score A

The analysis of the categorical data (correct/incorrect pronunciation of seven segmental features in question) was applied to calculate score A per student in both reading aloud tasks. For example, Table 1 shows the results of the high (31

points) and low (4 points) achievers in reading aloud individual words. The targeted phoneme is indicated by italics, e.g., b*a*g stands for the front open ash, and *bag 1* and *bag 2* mean that this word was read twice.

Table 1 The A raw scores of the best and worst students

| Examined segmentals in words | Best student | Worst student | Examined segmentals in words | Best student | Worst student | Examined segmentals in words | Best student | Worst student |
|---|---|---|---|---|---|---|---|---|
| L*a*mp | 1 | 0 | B*a*g 1 | 1 | 1 | *Th*rew | 1 | 0 |
| B*a*g 1 | 1 | 0 | B*a*g 2 | 1 | 0 | *Th*ought | 1 | 0 |
| B*a*g 2 | 1 | 0 | H*a*d | 0 | 0 | Every*th*ing 1 | 1 | 1 |
| H*a*d | 1 | 0 | Be*d* | 1 | 0 | Every*th*ing 2 | 1 | 1 |
| T*h*at | 1 | 0 | Suspected 1 | 0 | 0 | *Th*ey | 1 | 1 |
| Planned | 1 | 0 | Suspected 2 | 1 | 0 | *Th*en | 1 | 0 |
| *A*gain 1 | 1 | 0 | Waite*d* | 1 | 0 | *Th*at | 1 | 0 |
| *A*gain 2 | 1 | 0 | Planne*d* | 0 | 0 | *A*way 1 | 1 | 0 |
| S*u*spected 1 | 1 | 0 | Lock*ing* | 0 | 0 | *A*way 2 | 1 | 0 |
| S*u*spected 2 | 1 | 0 | Lo*ng* | 1 | 0 | T*w*enty | 1 | 0 |
| *A*way 1 | 0 | 0 | Everythi*ng* 1 | 1 | 0 | *W*aited | 1 | 0 |
| *A*way 2 | 1 | 0 | Everythi*ng* 2 | 1 | 0 | *W*atch | 1 | 0 |
| | | | | | | Sum | 31 | 4 |

Score A was calculated in a similar way for reading aloud the words in the diagnostic test. Both scores A were averaged per student. Table 2 provides the frequency of occurrence of each obtained score and grouped mean scores A for both reading aloud tasks, showing where the largest number of mean scores occurred (21-19 points), and the variations of scores A from 4 to 33 points.

Table 2 Frequency distribution of grouped mean scores A

| Grouped mean scores A | Frequency |
|---|---|
| 33-31 | 3 |
| 30-28 | 8 |
| 27-25 | 15 |
| 24-22 | 14 |
| 21-19 | 31 |
| 18-16 | 19 |
| 15-13 | 8 |
| 12-10 | 16 |
| 9-4 | 5 |

In order to categorize the data, each individual pronunciation feature was treated separately. For example, first, all the words containing /æ/ (*lamp*, *bag*, *had*, *that*, *planned*) were put under one heading, then the total number of correct pronunciations were counted, and afterwards percentages were computed, which indicated difficulty indices that tell us "how a given group of individuals

performed on average on a particular item" (Bachman, 2004, p. 122). In both reading aloud tasks, the difficulty index ($p_i$) was calculated and then the means of difficulty indices per seven segmentals in both reading aloud tasks were tabulated. Table 3 shows that the inspected segmentals proved to be of a varying degree of difficulty indices. The Czech learners experienced most problems with the production of the velar nasal in the word final position, the schwa, the voiced dental fricative in the word initial position, and the front open ash, while they were more successful with voiced consonants /g/, /d/ in word final position, the bilabial consonant /w/, and the voiceless dental fricative.

Table 3 Mean $p_i$ of individual segmentals in both reading aloud tasks ($N$ = 112)

| Phoneme | ŋ | Schwa | ð | æ | Voiced g, d | w | θ |
|---|---|---|---|---|---|---|---|
| Words | Long, locking, everything 2x | Again 2x, away, suspected 2x | Then, they, that | Lamp, bag 2x, had, that, planned | Bag 2x, had, bed, suspected 2x, waited, planned | Waited, watch, away, twenty | Threw, thought, everything 2x |
| Mean $p_i$ | 43.40 | 47.79 | 47.80 | 49.03 | 60.68 | 63.39 | 81.74 |

## 5.2. Pronunciation score B

The auditory evaluation of the students' pronunciations showed that there were numerous instances of mispronunciations in 24 words (see Table 3 above) in both reading aloud tasks apart from the seven categories of segmentals discussed above in 5.1. That is why we decided to take them into account as well. Actually, these accounted for another 13 points and their assessment is referred to as score B. As evident from Table 4, 58 out of 112 students achieved full score B, e.g., 13 points, but 54 students (48.2%) produced between 1 to 4 mispronunciations.

Table 4 Frequency distribution of mean scores B

| Mean scores B | Frequency |
|---|---|
| 13 | 58 |
| 12 | 24 |
| 11 | 22 |
| 10 | 6 |
| 9 | 2 |

The most frequently occurring mispronunciations contain: (i) unusual consonant th(r)- or vowel+consonant clusters (-ew, -ough) in English *threw*, *thought,* which are not found in the Czech language; (ii) incorrect pronunciation of the grammatical ending *-ed* in plan*e*d as in plan*e*t, probably due to the cognitive

demands caused by the pronunciation of one of the preceding phonemes in planned, which are not part of the Czech phonemic inventory; (iii) /e/ in closed and accented syllables pronounced as the front open ash vowel in bed (3.57%) and then (4.36%); (iv) a tendency to overdo the openness of a vowel in a stressed syllable, e.g., *locking*, *long* – /ɔː/ or /ʊ/; (v) some students mispronounced *lamp* as *lamb*, *lam*, *long*, *lump*, or non-existent /lem/; and (vi) *locking* was produced by few students as *looking* or non-existent /ˈlʌkɪŋ/, *bag* as *bug*, *planned* as *planet*, *plant*, *plan*, or non-existent /plenɪt/, /plentɪt/, /pǽntɪt/; *waited* as *wait*; *then* as *them*. The most frequent mispronunciations occurred in *thought* and *threw* (see (i) above). For example, in relation to *thought*, it was pronounced either like existing English words, such as *thaw*, *tore*, *tote*, *though*, *dough*, *true*, *two*, *tooth*, *threw*, *throw*, *tough*, *Seuss*, or non-existent ones: /θɔːθ/, /θəʊt/, /tʰruːt/, /tɔːθ/.

Two main causes of all these errors can be attributed to: (a) differences between the Czech and English phonemic inventories, and (b) different sound-spelling correspondences in Czech and English (Volín, 2010). Each phonemic error and each case of correspondence between the written and spoken form of English clearly deserves further discussion which, however, is beyond the main focus of this paper.

### 5.3. Total pronunciation score

The mean score B (out of 13 points) was added to the mean score A (out of 36 points) to arrive at the total score (out of 49 points) per student (Table 5 – the highest and lowest achiever).

Table 5 The highest and lowest total scores

| Students 1, ... 112 | Score A /36 | Score B /13 | Total score /49 |
|---|---|---|---|
| 1 | 31 | 13 | 44 |
| 112 | 4 | 13 | 17 |

Table 6 shows the mode (30 points), the median (31.5), and the mean (32.13) for the grouped score, with the range of 27 points. On top of that, it is useful to state that both maximum (44 points) and minimum (17 points) scores appeared once, and the mode occurred 11 times.

Table 6 Descriptive statistics of grouped total scores (*N* = 112)

| | |
|---|---|
| Mode | 30 |
| Median | 31.5 |
| Mean for grouped scores | 32.13 |
| Maximum | 44 |
| Minimum | 17 |
| Range | 27 |

From a grouped frequency distribution (Bachman, 2004) of 22 different aggregated scores (Figure 1), we can observe that most scores (32 occurrences) are grouped together in the middle between 31 and 34 points, and are slightly positively skewed, as the mean (32.13) is slightly higher than the median (31.5) and the mode (30).

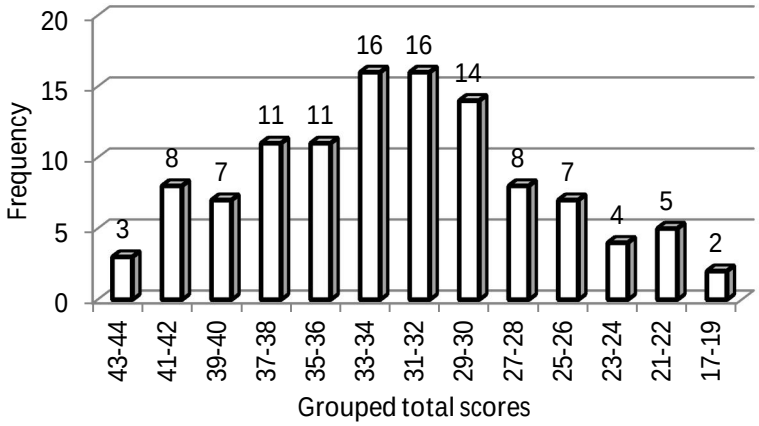


Figure 1 Histogram of frequency distribution of grouped total scores

5.4. Results: Focus on formal instruction

Two variables of formal instruction were dealt with in the study, that is the length of formal instruction in English and the number of NS teachers the students encountered. The participants had experienced a varied length of formal instruction, ranging from six to thirteen years (Figure 2); however, the majority of the cohort (77%) had undergone 10 or 11 years of formal instruction, with the mean of 10.58, the mode of 11 and the median of 11 years as well ($N = 112$).

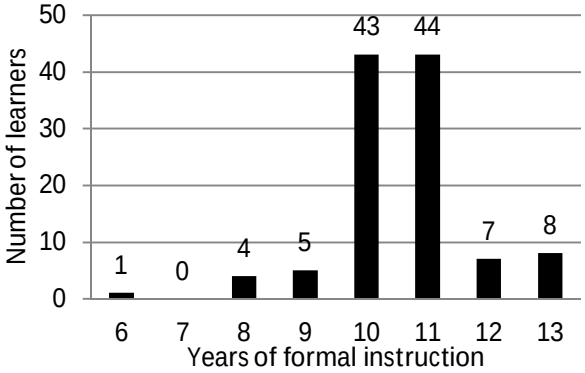


Figure 2 Number of years of formal instruction

Out of the 108 students who provided data related to the number of NS teachers of English they had encountered under the conditions of formal instructions, 43 in fact had such a teacher. If we take into account only these 43 students (Table 7), the mean was 2 NSs per student, the median was 3, the mode of 1 occurred 22 times, and 1 student had 14 NS teachers. However, 65 students have never received instruction provided by a NS teacher.

Table 7 The descriptive statistics for the number of NS teachers (*N* = 43)

| | Number of NS teachers |
|---|---|
| Mean | 2 |
| Median | 3 |
| Mode | 1 |
| Range | 13 |
| Maximum | 14 |
| Minimum | 1 |

Figures 3 and 4 below show striking differences between the numbers of NS teachers at primary or lower-secondary schools, on one hand, and upper-secondary schools, on the other hand. Figure 3 demonstrates that at primary and lower-secondary school, out of 112 learners only 9% were taught by one NS and 2% experienced two NS teachers. Seven per cent of the subjects did not provide an answer.

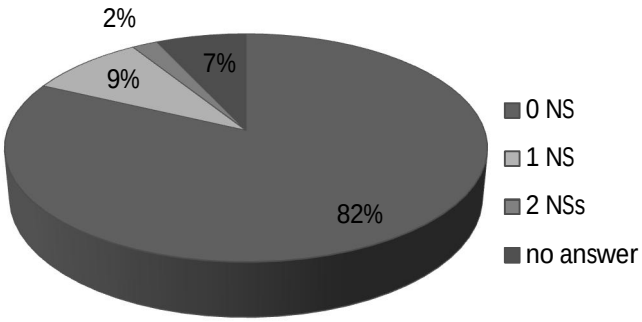


Figure 3 Subjects taught by a NS teacher at primary and lower-secondary school

The numbers for upper-secondary school were slightly different (Figure 4). Out of 112 learners, 27% had been taught by one NS, 5% by two NSs, 3% by three NSs, while 2% had experienced four NSs. The answers were not provided by four participants. To conclude, a majority of subjects did not have a chance to experience NS input at all.

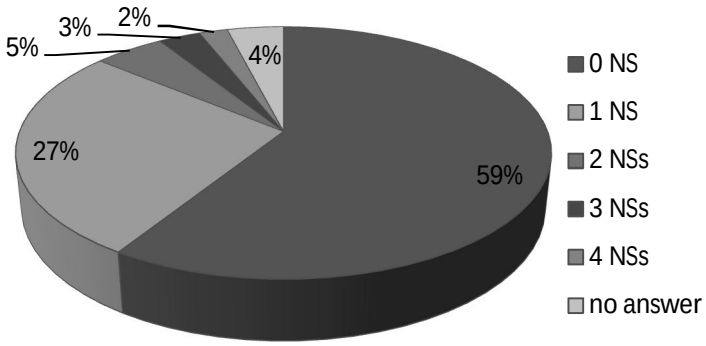


Figure 4 Percentage of subjects taught by a NS teacher at upper-secondary school

## 5.5. Total pronunciation score and formal instruction variables

We correlated the total pronunciation score with the number of years of formal study and used a *t*-test in order to find out whether there was any relationship between the students' acquisition of English segmentals and their exposure to NS teachers.

Table 8 Descriptive statistics for student groups according to the number of NS teachers

| . | Total pronounciation score | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | *N* | Standard deviation | Max. | Min. | Range | Median | Mode |
| Students exposed to NS teachers | 32.04651 | 43 | 5.538849 | 44 | 17 | 27 | 32 | 30 |
| Students not exposed to NS teachers | 32.77419 | 65 | 6.491582 | 43 | 21 | 22 | 32.5 | 31 |
| | | 108 | 5.888365 | | | | | |

The *t*-test ($t = 0.5712$) showed that the difference between the mean total scores in the group of students who were taught by a NS teacher ($N = 43$) and the group who were not taught by a NS teacher ($N = 65$) did not prove statistically significant at $t_{0.05\,(106)} = 1.984$. Surprisingly, even the mean of the total pronunciation score (32.04651) of students exposed to NS teachers was slightly lower than that of students with no such exposure. With respect to the number of years of formal instruction, we calculated Pearson's correlation coefficient, but the relationship proved to be weak and statistically insignificant ($p = 0.56408$).

## 6. Conclusions

The correlation between the length of English formal instruction and the acquisition of English phonemes did not appear to be statistically significant. Regarding

the difference in pronunciation scores between the group of students exposed to NS teachers and the group of students not exposed to NS teachers, *t*-test results indicated no relationship when it comes to the acquisition of English phonemes. On top of that, *t*-test results might also suggest that sheer exposure to NS input without explicit pronunciation learning might not be efficient enough in the context of formal foreign language teaching. Moreover, NNSs teachers might be aware of their learners' pronunciation difficulties with segmental features and might employ proper methodology. Nevertheless, the present study complements the work by Najvar and Hanušová (2010), although there are inevitable differences in research design, which may be attributed to the issues under investigation. In spite of that, the conclusions from both studies converge, i.e., the length of formal education in the Czech educational context was found not to be a predictor of attainment in a foreign language.

Obviously we are aware of a number of limitations of this study. Because of the nature of the research project, the questionnaire did not contain items tapping the quality and quantity of either NS teachers' input or that of NNS teachers; the researchers wondered whether the students would be able to provide reliable data in relation to them. On top of that, we cannot exclude the possibility of the subjects' encounters with English beyond formal instruction in the CR, which might have had an impact on the results of some high achievers in the inspected pronunciation areas. With respect to pronunciation assessment, primarily, the number of the assessors limits the possibility of generalizing the results and a NS assessor would have been helpful. Besides, we are faced with the question how far an inspected pronunciation feature can be perceived as a standard one, and so appropriate in non-native pronunciation. The results were also influenced by the fact that the pronunciation focus in the diagnostic passage was limited to the words contained in the wordlist, which, on the other hand, made a comparison feasible. Although the overall results dealing with the pronunciation of the selected segmental features helped us diagnose those in need of remedial teaching as tendencies to follow in teaching English segmentals, they do not shed light on an individual learner variation. In addition, the broad categories of the pronunciation features that were selected for analysis, e.g., schwa, have to be revisited with respect to their frequency and distribution in content and function words. Lastly, it would be interesting to investigate other learner-related factors in relation to both segmental or suprasegmental pronunciation features, and correlate them with selected variables related to formal instruction in English in the CR.

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Appendix

*Practice silently reading the text below. After about one minute, read the text aloud.*

He picked up the *lamp* and walked out of the room, *locking* the door behind him. As he walked down the stairs he *thought that* he heard what sounded like cries of pain. He stopped several times, and *waited*. No, *everything* was still.

When he reached the library, he saw the *bag* and coat in the corner. They must be hidden *away* somewhere. He unlocked a secret cupboard and *threw* them in. He could easily burn them later. Then he pulled out his *watch*. It was *twenty* minutes to two.

He sat down and began to think. Basil Hallward *had* left the house at eleven. No one *had* seen him come in *again*. The servants were in *bed* ... Paris! Yes, it was to Paris *that* Basil *had* gone. And by the midnight train as he *had planned*. It would be months before anyone *suspected* anything. Months! He could destroy *everything long* before *then*.

The extract was taken from Wilde, O. (2008). *The picture of Dorian Gray. Penguin Readers*. Harlow: Pearson Education Limited.