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Pronunciation Progress with Duolingo:  
A Case Study

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Anotace

Tato práce mapuje pokroky ve výslovnosti českého dospělého věčného začátečníka učící se angličtinu pomocí aplikace Duolingo po dobu tří měsíců. Respondentka vytvořila, na začátku i na konci výzkumu, audionahrávky dvaceti vět, které obsahovaly problematická slova pro české studenty angličtiny. Kromě toho byla respondentka požádána o nahrávku odpovědí na deset otevřených otázek týkajících se jejího názoru na tuto aplikaci. Výsledky výzkumu naznačují, že došlo ke zlepšení v plynulosti i sebejistoty u čteného textu. Nicméně většina očekávaných chyb ve výslovnosti byla přítomna před i po výzkumu. Celkový názor respondentky na Duolingo byl pozitivní.

Abstract

This thesis explores the pronunciation progress of an adult false beginner English learner of Czech origin who has been using Duolingo every day over the course of three months. The participant recorded twenty sentences that included problematic words for Czech speakers before and after the treatment. Additionally, ten open-ended questions were used for a recording to find out participant’s personal opinions on the app. The results suggested that an improvement in fluency and confidence in reading a text had been made. However, most of the anticipated mispronunciations were present and persisted even after the treatment. The participant’s overall opinion of Duolingo was positive.

Declaration

Prohlašuji, že jsem bakalářskou práci vypracovala samostatně, s využitím pouze citovaných pramenů, dalších informací a zdrojů v souladu s Disciplinárním řádem pro studenty Pedagogické fakulty Masarykovy univerzity a se zákonem č. 121/2000 Sb., o právu autorském, o právech souvisejících s právem autorským a o změně některých zákonů (autorský zákon), ve znění pozdějších předpisů.

Brno April 20, 2023 ....................................... Tereza Šikulová

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# Introduction

The importance of English in today's globalised world is indescribable. Not only do we come into contact with English on a daily basis, but English also plays a great role in the business sphere. The widespread use of English can be perceived all around us. Children, in the context of the Czech Republic, engage with the English language since infancy. And if not, then kindergarten is usually the latest. This is contrasted with the older generation, which previously hadn’t had the opportunity to study English. Numerous people decided to learn English, like any other language, later in their lives given the opportunities at work, by attending language schools and various courses or by trying themselves.

Self-education has become more accessible and convenient than ever before in this fast-paced world, thanks to technological advancements. Duolingo is one of the language-learning applications that has gained immense popularity in the past decade. With the elements of gamification and a comprehensible and user-friendly interface, Duolingo has made language learning amusing for millions of users around the globe. Attracting around 1,30 million Czech students into their English second language (ESL) course. However, for adult Czech learners of English, improving pronunciation can be a burdensome task. particularly if they belong to the dreaded category of false beginners. That is, those who have basic knowledge of and have been previously exposed to English at some point in their lives, yet they either have not progressed far in their proficiency or have forgotten a lot. These learners have the urge to restart their learning from the beginning, despite being familiar with certain phrases and aspects of the language. Progress in speaking skills can be even more complicated as they may have already acquired mistakes in their pronunciation that fossilised.

This thesis draws on the foundation laid by previous researchers concerning the topic of English pronunciation in general, as there are tremendous differences between the Czech and English phonological systems. The importance of understanding the discrepancy in the two languages’ pronunciation is fundamental for discerning the typical, often fossilised, mistakes of Czech speakers in English pronunciation. Therefore, it is also crucial for the investigation of the possible progress in pronunciation. Some research regarding Duolingo in the context of ESL learning has been done. However, these studies focused mainly on the improvement of vocabulary, grammar and general confidence of the students. To this day, there has been no study done regarding the speaking skill and pronunciation of English in the Czech context.

One of the main motivations for choosing this topic was the author’s personal experience with adult false beginners who attempted to become proficient English speakers but were unsuccessful. These speakers have been surrounding themselves with various English materials, such as music, TV shows, and movies, and have decided to become self-taught. They have chosen the Duolingo app to improve their skills because it provided great motivation for them, which they found sustainable and helped them create a habit of daily language learning. The author’s familiarity with the advantages, disadvantages, and possible outcomes gained through personal experience with Duolingo (studying different languages apart from English) also contributed to the inspiration to write this thesis.

This thesis aims to scrutinise the pronunciation progress of a Czech-speaking adult false beginner learner of English who uses the Duolingo app for thirty minutes a day across a period of three months. Specifically, this work aims to address the following research questions:

1. How does the pronunciation of adult false beginner develop over three months of using Duolingo for thirty minutes a day?
2. What are the challenges faced by an adult false beginner in improving their English pronunciation skills through Duolingo?
3. What is the participant’s opinion on Duolingo and their subjective assessment of progress?

This study provides insights into the effectiveness of Duolingo in improving the Czech false beginner learner’s English pronunciation skills. Additionally, the study examines the participant’s personal opinions on the application. The results of this study may help educators and developers of language learning applications design more effective tools and techniques to facilitate better language learning outcomes for adult learners.

Throughout the thesis, words written in italics appear, and they mark example words or words from the recordings. The use of asterisks before sounds or words marks errors.

# English phonetic system and the typical errors of Czech speakers

The following chapter briefly outlines the most important components of the English phonetic system and defines the terminology used throughout this thesis. The pronunciation that is set as the model in this work uses the phraseology relevant to Received Pronunciation (RP), which is most often recommended as a model accent for English second language learners (Roach, 2009, p. 3). Despite Duolingo teaching General American (GA) pronunciation, the decision to use the RP as a model has been made based on the fact that it is the most dominantly taught variation and the participant considers herself using the RP. It needs to be noted that Duolingo allows and does not regard using RP as a mistake in its spoken production feedback. The International Phonetic Association’s alphabet (IPA) has been used for the transcriptions.

The phonemic system of RP contains forty-four phonemes, which are usually classified by "locating the vowels in the vowel quadrilateral and consonants in a table according to a place of articulation, manner of articulation, and voicing" (Roach, 2009, p. 34). However, humans can make much more sounds than those forty-four phonemes. Therefore, the IPA has been used to transcribe the speech. It is crucial to make the distinction between phonetic and phonemic transcription. Phonetic transcription can pinpoint the minuscule details of the articulation of any sound thanks to the use of diacritics and symbols such as [ʔ], which indicates a glottal stop (Collins et al., 2019, p. 17). On the other hand, the phonemic transcription "shows only the phoneme contrast and does not tell us precisely what the realisations of the phoneme are" (Collins et al., 2019, p. 17).

The phonemic transcription was chosen, with the addition of some of the phonetic symbols when a more in-depth description was needed to mark fine details in pronunciation.

## Vowels

One of the simplest definitions of vowels is that they are created by a flow of air from the larynx to the lips with no obstruction in the way. Meaning that the tongue does not touch any part of the mouth cavity. To help us describe the English vowels, a set of language-independent reference vowels called cardinal vowels was developed by Daniel Jones (Jones, 1917). These vowels are produced when the tongue is in an extreme position, and they are marked on the quadrilateral shape, as can be seen in Figure 1. The extreme positions in this case refer to how low or high the tongue is in the mouth, creating the open or closed vowels, and whether the highest part of the tongue is located in the front, centre, or back of the mouth. The open and closed vowels can sometimes be referred to as the high and low vowels. Thanks to this classification, we can efficiently compare the English as well as Czech vowels within this framework to better understand the differences in the sounds.

Diagram

Description automatically generated with low confidence

Figure 1: *Primary cardinal vowels*

*Note.* Adapted from *English phonetics and phonology: a practical course* (p. 13), by P. Roach, 2009, Cambridge University Press.

Apart from the position of the tongue, the shapes and position of the lips have to be considered when describing a vowel quality. The lips can be either rounded, spread, or in a neutral position.

The basic division of the English vowels would be short vowels, long vowels, and diphthongs. Some authors, such as Collins et al. (2019), are using keywords from a lexical set introduced by John C. Wells in *Accents of English*. Wells (1982) classified English words into twenty-four lexical sets according to the pronunciation of their stressed syllables. He then chose a representative word from each set that gave a name to the vowels, which is illustrated in Figure 2, adapted from the aforementioned book (sections xviii, xix). These keywords will be used for easier reference to the vowels. The examples of words in which the particular sounds occur correspond to the words that were chosen for the recorded set of sentences.

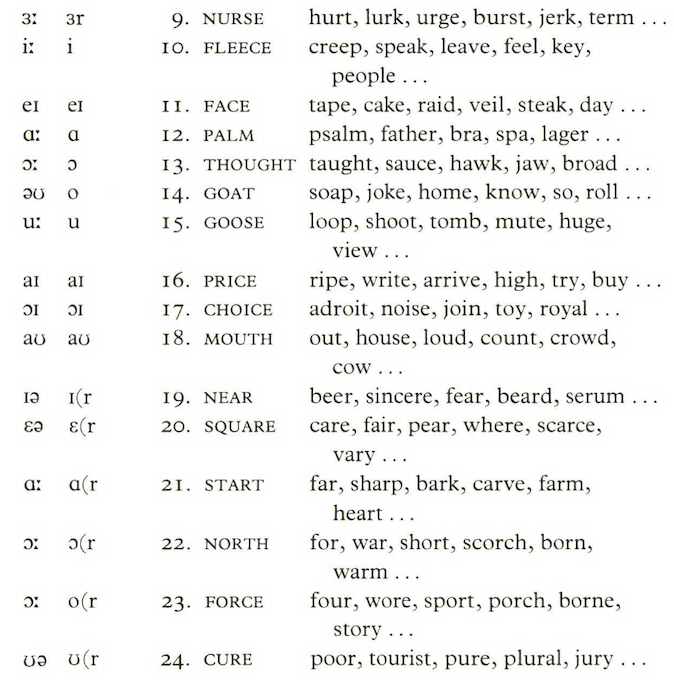
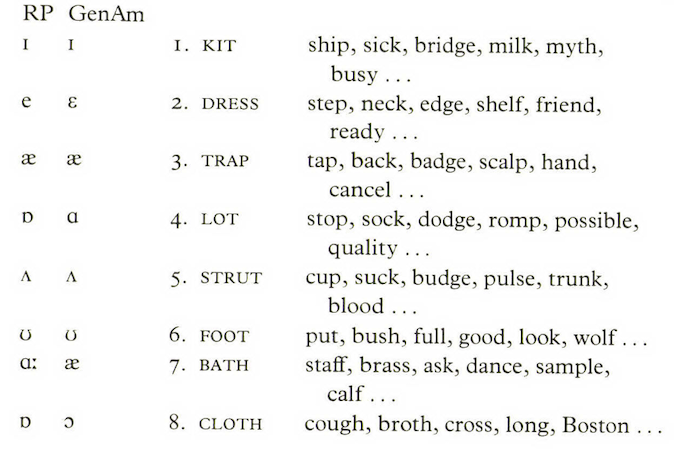


Figure 2: *Lexical sets*

### Short vowels

The short vowels are illustrated and described according to their position relative to the cardinal vowels in the figure 3 which is adapted from *English phonetics and phonology: a practical course* (p. 13), by P. Roach, 2009, Cambridge University Press. The shape and position of the lips is also enclosed in the description.

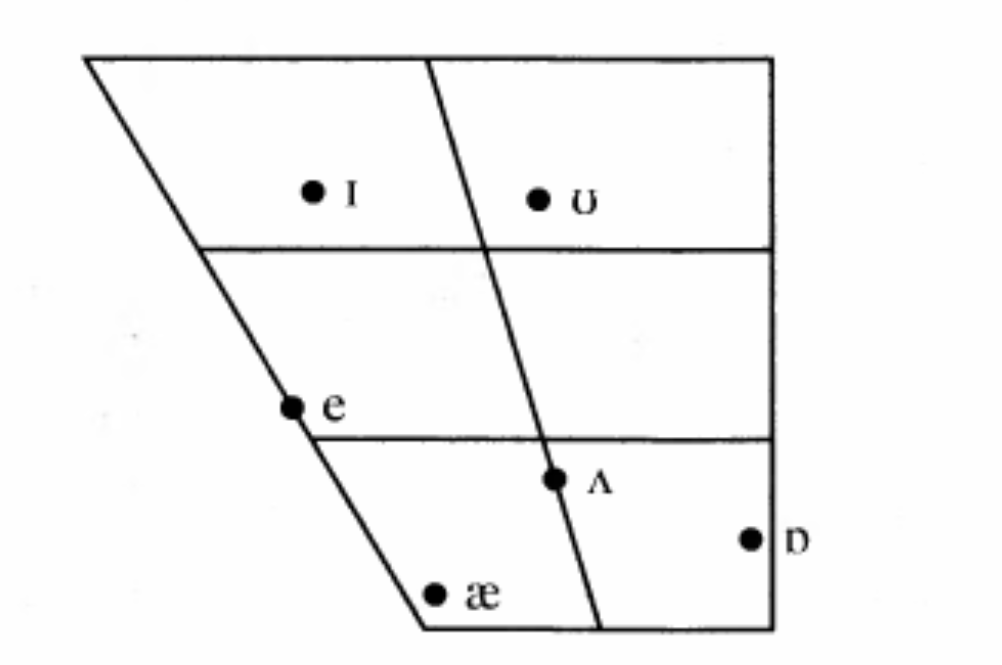


Figure 3: *English short vowels*

In more detail, they are:

* KIT vowel /ɪ/
  + In comparison to the cardinal vowel no. 1 is more open and closer to the centre, and lips are slightly spread.
  + Examples: *bit, wind, visit, in, little, guitar*
* DRESS vowel /ɛ/[[1]](#footnote-2)
  + A front vowel that is between the cardinal vowels no. 2 and 3 on the scale of closeness and openness, lips are slightly spread.
  + Examples: *vegetables, hotel, pet, lends*
* TRAP /æ/
  + Front vowel that is a bit more closed than the cardinal vowel no. 4, lips are slightly spread.
  + Examples: *apples, had, can, rat, anti-*
* LOT / ɒ/
  + Back vowel that is between the open-mid and open cardinal vowels no. 5 and 6.
  + Examples: *holiday, Australia, was, bomb*
* FOOT /ʊ/
  + Rather central, close-mid vowel in comparison to the cardinal vowel n. 8, lips are rounded.
  + Examples: *could, booked*
* STRUT /ʌ/
  + A central vowel that is closer to the open-mid in the tongue height, lips are in the neutral position.
  + Examples: *love, just, comfortable, mother, much*

The last, short central vowel is sometimes called the BONUS vowel but is more widely known as SCHWA /ə/. Schwa is the most common vowel sound (Knight, 2012). Examples: *father, favourite, gorgeous, neither, computers*

### Long vowels

The long vowels are illustrated in the same quadrilateral shape in Figure 4 (adapted from *English phonetics and phonology: a practical course* (p. 16), by P. Roach, 2009, Cambridge University Press) and will be described in the same way as the short vowels. To remind learners of English that these vowels are long, the symbol ː is used. However, in modern transcriptions and charts, the length is no longer marked as it largely depends on what follows. According to Roach (2009), the markings now serve just as a reminder as the long vowels differ from the short ones not only in length but also in meaning (p. 16). Yet for the sake of this thesis, the vowels will still have the markings for their length in the transcriptions.

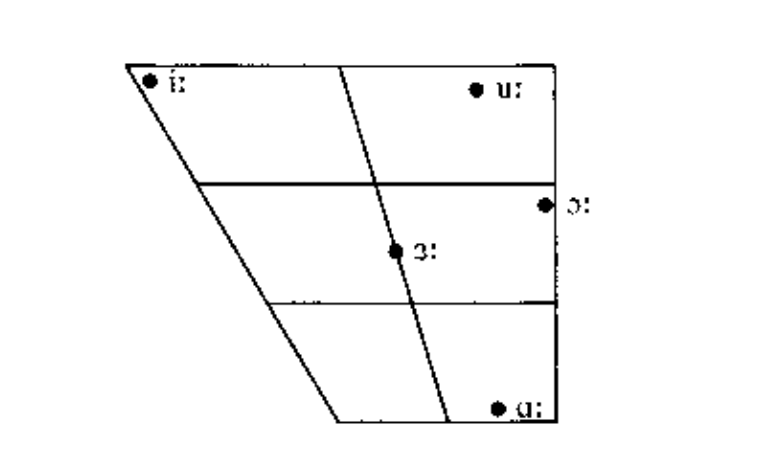


Figure 4: *English long vowels*

* FLEECE /iː/
  + Very close, front vowel and generally close to the cardinal vowel no. 1, lips have the slightest spread.
  + Examples: *knee, please, evening, cream*
* BATH /ɑː/, sometimes also called PALM vowel
  + Back vowel that is a bit more closed than the cardinal vowel no. 5, lips are in a neutral position.
  + Examples: *are, started, calm*
* THOUGHT /ɔː/
  + Back vowel with the tongue position between the cardinal vowels no. 6 and no. 7, closer to the close-mid tongue position, lips are rounded.
  + Examples: *record, gorgeous, nor, warm, report, morning*
* GOOSE /uː/
  + Rather back vowel, with the cardinal vowel no. 8 being the closest. However, it is more open. Lips are rounded.
  + Examples: *improved, using, you*
* NURSE /ɜː/
  + Mid-central vowel with lips in a neutral position.
  + Examples: *work, hurt, shirt*

### Diphthongs

The last category of vowels is diphthongs, which combine two vowels in one syllable with a glide. Triphthongs combine three vowels by gliding smoothly from the first, then the second, and finally the last one. An example of a triphthong would be the word hour, pronounced /ˈaʊə/. Diphthongs are generally the same length as long vowels, although the first part of the diphthong must be considerably longer than the latter part. Roach (2009) adds that the first part is also stronger, and with the finish of the glide, the loudness and strength decrease (p. 17). British English has eight diphthongs that can be divided into closing and centring diphthongs. Closing diphthongs means that the glide happens from a more open vowel to a more closed one. These diphthongs are namely:

* PRICE /aɪ/
* FACE /eɪ/
* CHOICE /ɔɪ/
* MOUTH /aʊ/
* GOAT /əʊ/

Vice versa, the centring diphthongs are realised by the glide “from the edges of the oral cavity to its centre” (Ondráček, 2014, p. 35). These are namely:

* NEAR /ɪə/
* CURE /ʊə/
* SQUARE /eə/

Special attention will be given to the vowels that are problematic for Czech speakers of English. If we generalise the topic of problematic vowels and consonants, they tend to be the ones that are absent in the Czech phonemic system. However, some of the mispronunciation results from the existence of similar phonemes that result in the transmission of the Czech pronunciation into English.

### TRAP vowel

Not only the absence of the TRAP vowel in Czech but also the difference in length is what makes this vowel problematic for Czech speakers. As it has been stated previously, in English, the length of not only the long vowels depends on the following, and this without exception applies to the /æ/ vowel. According to Melen (2010), the vowel sounds short to a Czech speaker when it is followed by a voiceless consonant and longer when a voiced consonant succeeds (p. 17). Skaličková (1974) supports this fact and also questions the belonging of this vowel to the short vowels category. The TRAP vowel, like the other short vowels, cannot stand in the final position. On the other hand, like the long vowels, it does not appear in the diphthongs, and the overall quantitive attributes indicate the long vowel classification (p. 30–31). The closest Czech equivalent would be /é/; however, the articulation of /æ/ is much more open, and the tongue does not touch the lower incisors. The Czech /é/ can also be found in both the final and initial positions, unlike the English /æ/. Cruttenden (2014) describes the pronunciation in a similar manner, stating that the mouth is more open than the English /ɛ/ and "the front of the tongue is raised to a position just above open, with the side rims making a very slight contact with the back upper molars" (p. 119).

Skaličková stresses the importance of differentiating between the vowels /ɛ/ and /æ/ for Czech speakers (1974, p. 31). That is also how Czech speakers frequently mispronounce words such as man /mæn/ will become \*/men/ or \*/mɑːn/.

### Schwa

There is no equivalent in Czech for the most commonly used vowel, schwa. Skaličková (1974) summarises that the only thing certain about the schwa is that it is a central vowel with a neutral lip position, as the other articulatory quantities vary based on the position in the word (initial, medial, final) and what precedes and follows the vowel as well (p. 40). The same applies to the length of this vowel; usually, it is quite short and articulated with little energy (Roach, 2009, p. 65). However, in the final position, it can lengthen, as well as depending on other properties of the word. For Czech learners, the main problem is mispronouncing the weak syllables as the strong forms, especially with the vowels /a, e, o/, which is a problem that Roach (2009, pp. 65–66) explores and suggests that learners should look at the spelling to help with the distinction between weak and strong syllables.

### NURSE vowel

The NURSE vowel also does not have its equivalent in the Czech language; therefore, it is often mispronounced. According to Cruttenden (2014), it is articulated with the tongue raised to a mid position while it does not touch the upper molars. The important part is that the lips are neutrally spread, as Czech speakers sometimes tend to round them, resulting in mispronunciation. Both Cruttenden (2014, p. 137) and Skaličková (1974, p. 42) warn about this phenomenon, stating that this rounding of the lip is unacceptable. The correct pronunciation should be achieved by the spread of the lips, keeping in mind that the articulation is realised in approximately the same way as the schwa is.

### Diphthongs /eɪ, aɪ, ɔɪ/

Not only are there no Czech equivalents to the three closing diphthongs that glide towards /ɪ/ but also the length of diphthongs, in general, differs in both languages. In Czech, both parts of the diphthongs /eu, ou, au/ have more or less equal length. On the other hand, as mentioned above, in English, the first part of the diphthong is significantly longer as well as louder. Czech speakers often substitute the sound /ɪ/ for the sound /j/; they pronounce it fully as if the elements were completely separated. The correct pronunciation, as Cruttenden (2014) suggests, should include just a light touch on the second part of the diphthong (p. 142). Ondráček (2014) includes the Czech phoneme group /aj, ej, ij, oj, uj/ and compares them to the FACE, PRICE and CHOICE diphthongs. He introduces the difference with the example of the word boy /bɔɪ/ which can be contrasted with the Czech word boj /boj/. The author agrees that Czech speakers should watch the length of these diphthongs and preferably weaken the later part to achieve accurate pronunciation in English (p. 35). Examples of FACE diphthong would be: *late, favourite, play, holiday.* Words such as *my, quite, I, buy* were chosen as examples of the PRICE diphthong.

## Consonants

English has twenty-four consonantal units, which can be most simply defined as sounds that involve at least partial closure of the vocal tract. The airflow obstruction can be created by the lips, tongue, or throat. Consonants are most often categorised depending on the place and manner of articulation. Cruttenden (2014) uses the following categorization of English consonants:

* 6 plosives /p, b, t, d, k, g/
* 9 affricates /f, v, θ, ð, s, z, ʃ, ʒ, h/
* 2 affricates / tʃ, dʒ/
* 3 nasals /m, n, ŋ/
* 1 lateral approximant /l/
* 3 approximants /r, j, w/

Regarding consonants, it is necessary to take into consideration whether they are voiced or voiceless. If they are voiced, it means that in addition to breath, lips, teeth, and the upper palate, they also need the vocal cords for their realisation. The easiest way to determine whether a consonant is voiced is to place a finger on one’s throat. When a vibration can be felt, the consonant is voiced (Giegerich, 1992, p. 3). Cruttenden (2014), in addition to voicing, adds "the degree of breath and muscular effort involved in their articulation" (p. 31). This distinction is marked as fortis (strong) and lenis (weak). The terms voiced/voiceless and fortis/lenis often coincide, as the voiced consonants are usually weak and vice versa, the voiceless consonants are articulated more strongly (Cruttenden, 2014, p. 31; Underhill, 2005, p. 30). The overview of the consonants is illustrated in Figure 5 which was adapted from *Gimson’s Pronunciation of English* (Cruttenden, 2014, p. 161).

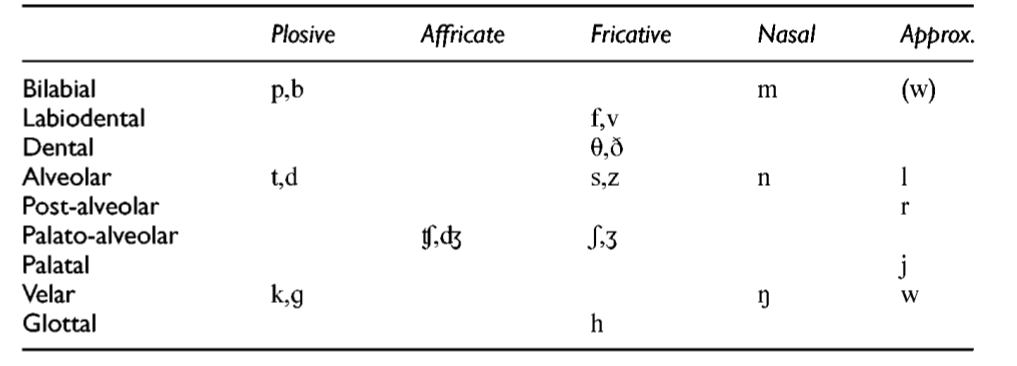


Figure 5: *Distinctive consonants of English*

Closer attention will be given to the consonants that are often mispronounced by Czech speakers or are in general troublesome. The problem with pronouncing particular consonants can have various reasons. Ondráček (2014) mentions, for example, the different articulation in terms of place and manner as well as the nonexistence of similar consonants in Czech, which is the case of / θ, ð, w/. The examples used for illustration of the problematic words correspond to words that were included in the set of sentences that were later part of the pre and posttest recordings.

### Dental fricatives /θ, ð/

The dental fricatives /θ, ð/ are undeniably the most troublesome consonants for Czech speakers, and even advanced learners often mispronounce them. According to Collins et al. (2019), the tip of the tongue makes contact with the back of the upper teeth during articulation (p. 71). Both Roach (2009) and Skaličková (1974) note that teachers of English often advise their students to place their tongues between their teeth as a makeshift aid to help them with articulation (p. 41, p. 99). However, this technique or tip is not necessarily the best, as it can lead to the fossilisation of the wrong articulation. According to Cruttenden (2014), the position of the lips is determined by the neighbouring vowel; the lips can be spread, as in the word *heath*, or slightly rounded, as in the word *truth* (p. 199).

Melen (2010) emphasises that a Czech learner should remember that /θ/ is voiceless, longer, and shortens the preceding vowels, while the /ð/ is voiced, shorter, and does not shorten anything that precedes it. The articulation itself is not usually the problem, as most learners are able to produce the sound correctly when isolated. According to Cruttenden (2014), foreign learners find it complicated when these consonants are combined with another fricative, especially /s,z/ (p. 200). However, Czech speakers often find it troublesome to pronounce them correctly when they are in the initial position. The resulting accommodation is then realised by substituting the voiced dental fricative /ð/ with the closest sound in Czech which would be /d/ or /z/, so the word father /ˈfɑːðə/ will become \*/ˈfɑːdə/ or \*/ˈfɑːzə/. The most usual mispronunciation of the voiceless dental fricative /θ/ is /t/, /f/, or /s/. An example of a word that would result in worse intelligibility if mispronounced would be three /θri/. A wrong pronunciation of [triː] or \*[friː] could result in the listener thinking that the speaker meant to say *tree* or *free*. Examples of the voiceless dental fricative /θ/ would be *thirties, thank, Thursday, both.* Similarly, as examples of the voiced dental fricative /ð/ words such as *this, they, father, neither* and *mother* were chosen.

### Labial-velar approximant /w/

This is the last consonant that does not exist in the Czech language. It is crucial to examine its articulation closely, as it is widely substituted by the voiced labiodental fricative /v/, which can result in a complete change of meaning. An example of the difference would be the minimal pair *wine* x *vine*. According to O’Connor (1998), articulation is realised by a glide from a starting position of /u:/ or /ʊ/ to whatever vowel follows. The shape of the lips should be rounded, as this distinguishes the /w/ from the /v/ because there is no friction if the lips are well-rounded. The voiced labiodental fricative /v/ is articulated with flat lips, where the upper teeth create friction on the lips (pp. 58–59). Melen (2010) also stresses the strong rounding of the lips and adds that the final phase of the articulation includes the quick retraction of the rounded lips when simultaneously moving to the next vowel (p. 35). This interchange of the /w/ and /v/ sounds is one of the most common mistakes of foreign learners in general. However, it is one of the more easily avoidable mistakes, as many of the learners simply don’t realise that there is a difference in those sounds. The model words included in the recorded sentences were for example *wind, warm, work, wish, quite.*

### Velar nasal /ŋ/

This nasal is articulated with the back of the tongue in the velar position, which means on the soft palate of the mouth, same as the plosives /k, g/. It can be a great practise to produce a continuous /ŋ/ sound; however, speakers should be mindful of not producing any /k/ or /g/ sound at the end (Roach, 2009, p. 46). In English, this consonant is never in the initial position; often, it is in the final position. However, in the final position, it doesn’t have to be accompanied by the /g/ or /k/ and that is what makes the pronunciation of /ŋ/ so difficult for foreign English learners. Especially for Czech learners, it is even more difficult as /ŋ/ only exists in the medial position before /k, g/ e.g., b*anka, srnka* (Melen, 2010, p. 36; Skaličková, 1974, p. 115). Unfortunately, this mix-up can lead to worse intelligibility as / sɪn/, /sɪŋ/, and /sɪŋk/ are three completely different words (*sin, sing, sink*) but a Czech speaker might have trouble distinguishing between the different pronunciations. Including the voiced alveolar plosive /g/ in the final position is also unacceptable. Examples of the problematic words in which the velar nasal /ŋ/ is in the final position are *morning, evening, sing, using.*

## Silent letters

Silent letters are letters that do not correlate with any sound when a particular word is spoken. According to Dubosarsky (2009), sixty per cent of English words contain silent letters. Both vowels and consonants can be silent, and those letters can appear in the initial, medial, or final position. Some of the silent letters have been preserved in the spelling of the original language, such as *psychology* from Greek or *tsunami* from Japanese. However, /ps/ and /ts/ do not comply with English phonological rules, so the first letters were converted to silent ones. Another case when silent letters are used in writing is to differentiate homophones, for example, *hour* and *our.*In contrast, Czech basically follows the rule "I spell what I read". The exceptions would be *dcera* or *srdce,* where the letter d is silent in pronunciation. The fact that the Czechs are so used to this system means that the silent letters are sometimes pronounced when they should not be. Ondráček (2014) mentions a similar phenomenon and calls it "Spelling Pronunciation" stating that this happens when "the Czech value of a letter or letter group was used instead of the English" (p. 103). He illustrates this phenomenon with an example of the word *Christmas* /ˈkrɪsməs/ where the speaker pronounced the beginning of the word as the Czech /ch/. Consequentially, the native speakers indicated that the word was pronounced as /ˈhrɪsməs/ (Ondráček, 2014, p. 103). In the sentences designed for the recordings, a total number of 8 words containing silent letters were included. Namely, it was *doubt, knee, often, listens, guitar, anti-wrinkle, calm* and *bomb.*

# Duolingo

Duolingo is an American language-learning platform available both as a website and a mobile app. This platform combines the principles of spaced repetition and gamification to achieve higher user interaction. Another of the teaching strategies of Duolingo is a direct translation (Nushi & Eqbali, 2017, p. 96). These principles are discussed further in the following chapter.

Duolingo combines different activities and approaches to fit a wide variety of language learners’ styles. Ravenscraft (2019) summarised the activities in the following way:

Duolingo offers a skill tree of lessons that use listening exercises, flashcards, and multiple-choice questions to drill you on new words, phrases, and sentences. Most questions have a comment thread where users can discuss a particular question in detail. The service also has community features that let you connect with other people who are learning the same language you are (para. 3).

The order of activities changes every time the user starts a new lesson. However, the structure remains the same. It includes listening and speaking exercises and reading exercises in both first language (L1) and second language (L2). The input of answers also varies, including multiple-choice, filling in a gap, or a complete translation, which requires typing in the answer. For speaking exercises, the user is asked to dictate the reply using the device’s microphone. Nonetheless, the speaking and listening exercises can be silenced and postponed in the settings of the application as needed.

Duolingo aims to make learning fun and is conducive to building a habit of language learning thanks to the fact that users can choose to dedicate 5 to 20 minutes a day. Both the apps and the website motivate the users with daily experience points and streaks, which mark how many days in a row the user completed a lesson. Push notifications[[2]](#footnote-3) and email notifications are other incentives for users not to slack. The same does the "League", a competitive space where users contend using their weekly experience points earned from the lessons. The simple yet colourful design and game-like mechanics, combined with the mascot, a green owl named Duo, made the app a worldwide hit.

## History of Duolingo

The first idea for Duolingo surfaced at the end of 2009 in Pittsburgh, Pennsylvania, when the founder Luis von Ahn sold his company reCAPTCHA to Google (Loeb, 2018, para. 5). Von Ahn (2016) said for Quora that "the whole thing started as an academic project at Carnegie Mellon between me and my PhD student Severin Hacker" (para. 1). The intention was to offer free language education because von Ahn revealed that a hundred thousand people are learning English, yet many don’t have the resources for funding further education, regardless of the need for it for better job opportunities (von Ahn, 2016). This so-called promise of the founder was kept, as Duolingo is to this day free of charge. The company offers a Duolingo Plus subscription that presents an ad-free environment and more personalised content regarding the users’ repeated mistakes or better tracking of their progress which utilizes artificial intelligence.

In 2013, Duolingo, previously operating just as a website, finally became available to Android users, following the trend of iPhone Apps from 2012 (Lardinois, 2013, para. 1). At that time, Duolingo had around 3 million users, and von Ahn stated that "given the popularity of Android in Duolingo’s large target market of Latin America, this new version will help it to double the number of active users very quickly (Lardinois, 2013, para. 5). From here, the number of users plummeted, and by the end of 2015, Duolingo reached 100 million registered users (Lardinois, 2015, para. 2).

Duolingo did not stop with the apps. In 2019, the company launched Duolingo stories for English speakers learning French, Spanish, German, Italian, Portuguese, and Japanese. These stories present everyday situations and improve listening and reading skills. Duolingo is also associated with podcasts for intermediate speakers and an app called Duolingo ABC that teaches the youngest letters, phonics, and sounds.

## Current situation and Czech users

What started as a college project has become the best-known language learning app, with a user base exceeding 500 million. Duolingo now offers 40 languages in over 100 courses, as it provides instructions not only in English but, for example, in Spanish, German, Polish, Korean, and Chinese. This makes the app far more attractive to complete beginners without knowledge of the English language. This strongly applies to Czech language learners, as Duolingo’s English course offers Czech as L1. According to the 2021 Duolingo Language Report, the Czechs were, in fact, the hardest-working country, meaning they completed the most lessons per learner (Blanco, 2021) for the year 2021. Currently, when registering for the English course on Duolingo using the Czech version of the website, it states that 1.30 million people have chosen this course.

## Structure of Duolingo courses

In November 2022, the whole interface of the application was transformed into a more structured and comprehensible form, creating a learning path. The English course for Czech speakers contains 47 units, each of which contains up to 10 levels, which are then divided into lessons, practise, and stories. The lessons might contain up to five blocks of exercises where the beforehand mentioned types of activities are rotated covering the topics. Practise is embedded into the learning path to remind the user of mistakes that were made and strengthen difficult concepts. Lastly, the stories focus on listening and reading comprehension. All units have a brief description of the topics covered, and additionally, Duolingo now offers guidebooks that comprise keywords and phrases.

Duolingo (Munson et al., 2022) emphasised the importance of spaced repetition, which they made the default learning strategy with their last redesign. They also claim that including the stories in the learning path helps the users be more active readers and listeners and makes them more flexible and confident in real-life situations as they are practising deduction from context.

## Speaking in Duolingo

The Duolingo curriculum designer and learning scientist Moline and Blanco (2020) suggest in their blog post that every sentence that a user encounters while learning be repeated out loud. The authors also propose that performing the speaking exercise will help students with pronunciation and linking (para. 6). AI recognition is used for assessing accuracy. On the Duolingo Help Centre, it can be found that "The Duolingo Android app uses Google’s speech recognition for our speaking exercises" ("My microphone is not working", n.d., para. 10), and likewise, it uses Apple’s speech recognition software for the iOS app. Nevertheless, Bajorek (2017) criticised Duolingo’s integration of binary feedback on spoken production, calling it "underdeveloped". Following the year 2014, Duolingo implemented colour-coded binary feedback on spoken production across all platforms. However, since then, there has not been much improvement in the development of the assessment of spoken production.

Moreover, the mobile application version of the course now includes a section for learning English pronunciation. This section covers all twenty-four English consonant sounds as presented by Underhill (2005) in his phonemic chart (p.2). However, the section does not include all vowel sounds. The sounds of long vowels /ɑ:/ and /ɔ:/ and diphthongs /ɪə/, /ʊə/ and /eə/ are not covered. The structure of the lessons in the pronunciation section is quite repetitive. It includes listening to two different speakers and deciding whether they say the same or different words or matching the presented recording with the correct written word of the word. The lessons also include spoken input. These exercises exclusively contain minimal pairs. Correct answers always include the phonetic transcription. In the overview menu of the pronunciation section, the user has the opportunity to listen to all the vowel and consonant sounds by pressing them, which will provide the pronunciation of the isolated sound as well as the sound in one representative word. The biggest drawback is that this feature is currently available only for Apple device users.

## Academic research on Duolingo in the English as a foreign language context

The existing academic research dealing with using Duolingo for English learning is very limited. Some researchers who focused on the use of Duolingo as part of a classroom experience usually reported positive outcomes. For example, Alfuhaid (2021) concluded an improvement in speaking proficiency as well as in vocabulary range. The development of vocabulary knowledge is among the most highlighted positive effects of using Duolingo (Ajisoko, 2020; de Sousa, 2018). However, the small number of research studies devoted to speaking proficiency often map the students’ or teachers’ perceptions and draw conclusions based on questionnaires (Mahbub et al., 2020; Rofida, 2022; Syafrizal et al., 2022). As aforementioned, among researchers, Duolingo is considered a great addition to coursework, and findings suggest significant improvements in students’ engagement, enjoyment, motivation, and also confidence (Alfuhaid, 2021; Ali, 2022; Mahbub et al., 2020). It needs to be stressed that researchers are careful about pinpointing the disadvantages of Duolingo and would rather focus on even the smallest positives. It has been widely discussed that Duolingo, especially in the beginning, was using irrelevant, almost nonsense sentences in their exercises and therefore making the language learning less relevant for the learners. Other criticised areas included the lack of human interaction, the lack of explicit teaching of grammar, and the general overemphasis on vocabulary and phrases. (Murdoch, 2023; Ravenscraft, 2019). Extensive knowledge of vocabulary items does not equal better fluency. Nushi and Eqbali (2017) add that "short phrases and sentences may not get learners to a conversational level" (p. 97), which Lotherington (2016) confirms.

In one of the articles on the Duolingo blog (Swecker et al., 2021), the company states that they started to collect anonymized speech data from users who gave permission to do so. According to the company, the data could later be used to help them develop new features beneficial for speaking skills, such as "giving tips on pronunciation, word by word, sound by sound; picking speaking exercises that focus on areas where you need the most practice…" (Swecker et al., 2021). Taking into consideration that Duolingo is rapidly developing an application that has already been incredibly improved over the years, it will be given the benefit of the doubt.

# False beginner phenomenon

A false beginner in any language study is a person who has had previous exposure to the target language and has some knowledge, corresponding to levels A1/A2 of the Common European Framework of Reference (CEFR), but needs to start learning the language from the beginning. The reason why students of any age eventually become false beginners is first and foremost their motivation. The internal motivation is crucial in foreign language learning. However, with older age and sometimes unsuccessful previous attempts, the motivation as well as confidence of the students degrades.

Focusing on the Czech Republic, the reasons are more complicated due to the past political situation. Before the year 1989, Russian was the most common second language taught in Czechoslovakia and was mandatory as of the year 1948. Any other second language, such as German, French, or English, was taught during secondary education (Novotná, 2007). The situation changed after the year 1989 and the "velvet revolution" when English became more accessible, for example thanks to Education for Democracy, an organisation facilitating volunteers in America, which sent over 600 volunteers to teach English in various sectors across Czechoslovakia ("Americans Teaching English", 1991).

Currently, English is being taught at the latest in the third grade of elementary school. However, the majority of schools offer English from the first grade, sometimes as an extracurricular activity. Parents may also opt for the opportunity of bilingual or English-language kindergartens.

The previous regime in the Czech Republic created a huge group of people who started learning English in adulthood. According to Carr (2020), the acquisition of a second language is harder in older age as the plasticity of the brain diminishes. He also states that the acquisition of L2 happens when a person already has knowledge of some kind of first language, which then interferes with the acquisition of any other languages (p. 194). This is especially true to phonetics and phonology, or pronunciation, as the learners often tend to apply the same rules from their native language to English.

# Methodology

The following research aims to investigate the pronunciation progress of a Czech adult false beginner learner who is strictly using the Duolingo app over the course of three months. There has been no study done in the field connecting pronunciation and Duolingo in the Czech context. The following research questions have been chosen for the research:

1. How does the pronunciation of adult false beginner develop over three months of using Duolingo for thirty minutes a day?
2. What are the challenges faced by an adult false beginner in improving their English pronunciation skills through Duolingo?
3. What is the participant’s opinion on Duolingo and their subjective assessment of progress?

In the first part of this thesis, the reader was briefly introduced to the English phonological system, and attention was drawn to the sounds that are most often problematic for the Czech speakers. The reader was also presented with a comparison between the problematic sounds in English and the sounds that are predominantly used as substitutions by Czech speakers of English. The Duolingo platform and apps were introduced to the reader as well as the previously done research. Lastly, the phenomenon of false beginners was described.

This chapter presents the research design, the data collection method, and the analysis.

## Research design

This study is a qualitative study, more specifically, a longitudinal case study. As this research aims at exploring the progress of a participant, the pretest-posttest design was chosen. The pretest-posttest design examines if a treatment caused a change by measuring the outcome of interest before and after the treatment (Frey, 2022, p. 1250).

In the pretest phase, the participant was asked to record herself reading a set of twenty sentences. The sentences were designed with the intention of emulating the typical problematic words for Czech speakers. The words were chosen based on the research done by the authors mentioned in the previous chapters, as well as knowledge of the differences between the Czech and English phonological systems that helped map out the problematic areas of pronunciation for the Czechs. A great inspiration was an extensive list provided by Metruk (2017) in the chapter *Errors in the English Pronunciation by Slovak and Czech EFL Learners*. Inspirational were also presentations on the topic of segmental and suprasegmental pronunciation features created by Ms Tomková for her courses at Masaryk University. The sentences were designed with a primary focus on the segmental features. Although some of the items have served as a great basis for the observation of the suprasegmental features, particularly stress, they were often taken into consideration unless a significant error in primary stress occurred. This was due to the fact that the participant’s overall fluency and language proficiency was not sufficient enough to focus on the suprasegmental features. However, if a longer text or a fluent spoken production would be the subject matter used in the research, both segmental and suprasegmental features could be considered. During the creation of the sentences, the participant’s level of English was considered too. The goal was to create sentences in which the majority of vocabulary and grammar are known to the speaker, but some of them are still a bit challenging. The set of sentences is included in Appendix A, with the intended problematic words in bold. A description of the possible mispronunciations is also enclosed.

The initial recording was then transcribed using phonemic transcription and compared to the transcription of the same sentences but in RP. The comparison was used to localise and determine what mistakes were present in the pronunciation and of what nature the mistakes were. It was also noted whether these mistakes did comply with the general assumptions of mistakes made by Czech speakers of English or if they were specific to this particular participant.

The treatment was taking place over a period of three months. The participant was asked to do the regular Duolingo lessons every day for approximately twenty to thirty minutes. This is also one of the options that Duolingo itself suggests when entering a new course or setting up the profile. It walks the user through the survey where they can choose their desired daily goal, where a 20-minute pass mark is marked as intense practise. Duolingo claims in its app that this intensive practise can result in faster progress and, more importantly, in building a healthy habit of daily language learning. In addition to following the standard Duolingo path and lessons, the participant also implemented one of the tips that were suggested to her by the Duolingo app. That is, to repeat every sentence presented during the lessons out loud.

The posttest consisted of the same set of twenty sentences, and the participant was again asked to record herself reading the sentences out loud. The same process of transcription was followed, as well as the comparison to the RP transcription. Furthermore, the transcription of the second recording was compared to the transcription of the pretest recording to determine whether some of the mistakes were eliminated thanks to the treatment or if they persisted. In addition to the recording, the participant was sent a short questionnaire with open-ended questions as part of the posttest. The sentences can be found in Appendix B. She was asked to record her reply to those questions. This questionnaire aimed to find out about the participant's experience with and personal opinion of the Duolingo app, as well as her progress. Recording the responses was chosen to allow the participant to express her thoughts honestly, from the top of her head. Sometimes a learner’s intelligibility differs based on whether they are reading something out loud or speaking. An additional interview was conducted in the Czech language. The interview happened over the phone, and the participant was asked the same questions but in the Czech language. This decision was made based on the findings during the process of analysing the questionnaire recording. It has been found that the participant’s intelligibility was low, and she had trouble conveying her feelings and ideas sufficiently. The poor intelligibility during the questionnaire might have been caused by a combination of speaking anxiety and poor vocabulary and grammar knowledge. The supplementary interview enabled the participant to add information that completed her opinion on the application and her progress.

## Participant

The participant in this study is a 55-year-old female. She has not received any formal education in English, as she has been in the Czech educational system since before the Velvet Revolution. Therefore, her first foreign language was Russian in both elementary and secondary school. She was studying at the University of Chemistry and Technology in Prague when she first came into contact with English in an educational environment. She took a technical English course for chemists where she learned just numbers or the nomenclature of elements and compounds, so nothing that would be useful in real life. Additionally, the teacher had overlearned from Russian to English. Later in her life, around 30 years of age, she started to explore the self-learning books that she borrowed from the library. She particularly remembers a book called *Angličtina pro věčné začátečníky* by Ludmila Kollmanová that was published around the year 2001. She also attended conversation lessons in small groups that were taking place in the lecturer's home. This course only lasted half a year and did not bring satisfying progress. A little bit of a breakthrough happened when an employer offered language lessons that lasted an hour and a half and were in very small groups of three people. The topics covered were relatable to real life and situations like at the airport, in the shopping mall, asking for directions, and so on. The participant felt like she excelled, and it was too easy as she already covered these topics as a self-learner, so she understood everything. However, as all the learners progressed, it became more challenging and then, unfortunately, ended. She tried to get back on track with some books and manuals for self-study learners of English, but she was never motivated for very long to complete the books. Lastly, she tried the Duolingo app, which sustained her motivation for the longest time of all the previous methods she tried. The participant never took any test that would estimate her level of English on the CEFR spectrum.

# Analysis

## Pretest sentences

This chapter presents the set of 20 sentences that were presented to the participant as the pretest. There is a transcription in RP below the sentences. The voice recording was transcribed and then analysed for mistakes in pronunciation that differed from the RP.

The mispronunciation in the participant’s recording is colour-coded to the following categories: yellow means that the mistake was anticipated or belonged to the category of typical mistakes that Czech speakers make. The green colour means the word was pronounced almost correctly or in General American, which is still an unwanted pronunciation regardless of the correctness. Lastly, the red colour represents mistakes that are specific to this particular participant or "serious" mistakes that could harshly affect the intelligibility as the words might sound like something else.

1. I wish I could visit you in England.

/aɪ wɪʃ aɪ kʊd ˈvɪzɪt juː ɪn ˈɪŋɡlənd/

\* /aɪ ˈvɪʃ aɪ kɔːld vɪsɪt juːˈɪnglənd/

Voiced labiodental fricative /v/ instead of /w/ in *wish*. *Could* mispronounced sounded like *cold* and completely unpronounced preposition *in.*

1. I doubt it.

/aɪ daʊt ɪt**/**

\*/aɪ ˌdəʊbt ˈɪt/

The diphthong /aʊ/ pronounced like /əʊ/ or similar to the Czech diphthong /ou/. The silent /b/ is pronounced and a strong stress is placed on the final part of the sentence.

1. She had to work until very late.

/ʃiː hæd tuː wɜːk ənˈtɪl ˈvɛri leɪt**/**

\*/ ʃiː hæd tuː wɔːrk ˈentɪl wɛrɪ leɪt/

The verb *had* is pronounced almost correctly with the TRAP vowel, however, the Czech /é/ still can be a little bit heard and could be more open. *Work* is pronounced more like *wark* a Scottish word for work (Collins, n.d.). The stress in *until* is misplaced in the typical Czech initial position. Lastly, here the voiced labiodental fricative /v/ is missing in the word *very*, which then sounds more like *weary*. Every single word seems to be stressed.

1. Could you buy some vegetables?

/kʊd juː baɪ sʌm ˈvɛʤtəbᵊlz**/**

\*/ˈkɔːld juː baɪ sʌm ˌvɛdʒɪˈteɪbᵊlz/

Same mispronunciation of *could* as in sentence number 1. Vegetables follow the typical Czech wrong pronunciation that Metruk (2017) mentions including the misplacing of stress.

1. My father hurt his knee.

/maɪ ˈfɑːðə hɜːt hɪz niː/

\*/maɪ ˈfɑːdər hɜːt hɪz ˈkniː/

This sentence has a nice rhythm, however, the voiced dental fricative /ð/ is substituted by /d/ in the pronunciation. The silent /k/ in *knee* is fully pronounced.

1. Please record the show in the evening.

/pliːz [ˈrɛkɔːd](https://tophonetics.com/) ðə ʃəʊ ɪn ði ˈiːvnɪŋ**/**

\*/pliːz rɪˈkɔːrd də ʃəʊ ɪn də ˈiːvnɪŋk/

The verb *record* was pronounced rather like the noun in American English.

The determiner *the* was in both cases pronounced with /d/ and the strong form was pronounced like the weak one. After the velar nasal /ŋ/ in the final position the /k/ can be heard.

1. The zoo is closed on Thursday.

/ðə zuː ɪz kləʊzd ɒn ˈθɜːzdeɪ/

\*/də zuː ɪz ˈkləʊzd ɒn ˈtɜːzdeɪ/

The z sounds in *is, closed* sound a little bit more like /s/, however, the pronunciation is not much different. The same goes for the diphthong /əʊ/ which is pronounced almost correctly, the Czech /ou/ still can be heard a little bit. The voiceless dental fricative /θ/ in *Thursday* is pronounced as /t/, but it can be heard that the participant is trying very hard for the correct pronunciation in the initial position.

1. He often listens to the radio.

/hiː [ˈɒfᵊn](https://tophonetics.com/) ˈlɪsnz tə ðə ˈreɪdɪəʊ**/**

\*/ hiː [ˈɒfᵊn](https://tophonetics.com/) ˈlɪsnz tə də ˈreɪdɪəʊ/

Almost perfect pronunciation, nice cadence, and rhythm. The weak determinant *the* is also pronounced almost right, the /d/ sound can be heard slightly.

1. I love both apples and pears, they are my favourite fruits.

/aɪ lʌv bəʊθ ˈæplz ænd peəz**;**ðeɪ ɑː maɪ ˈfeɪvərɪt fruːts/

\*/aɪ laːf boʊs ˈæplz ænd ˈpɪəz; dei ˈɑːʳ maɪ ˈfeɪvərɪt fruːts/

The verb *love* is pronounced with a very long /a/ sound similar to Czech /á/ and the /v/ in the final position is changed completely to the fortis pair /f/ so the word almost sounds like *laugh*. The voiceless dental fricative /θ/ is pronounced as /s/ and the preceding diphthong /əʊ/ is once again pronounced more like the Czech /ou/. The mispronunciation of *pears* changed it into peers. This could highly affect intelligibility, as we only know that the participant is speaking about a type of fruit from the context. *Are* is pronounced in General American instead of RP.

1. His shirt is gorgeous.

/hɪz ʃɜːt ɪz ˈɡɔːʤəs**/**

\*/hɪz ʃirt ɪz ˈdʒɔːrdʒəs/

The mispronunciation of the NURSE vowel in *shirt* is in this caused not caused by rounding the lips as described in the previous chapters but rather happened because the Czech speaker pronounces what they read. In *gorgeous* the /g/ sound in the initial position is pronounced in the same way as the latter one in the word – assimilation.

1. I Improved just a little bit.

/aɪ ɪmˈpruːvd ʤʌst ə ˈlɪtl bɪt/

\*/ aɪ ɪmˈprɔːvd dʒʌst ə ˌlɪtl ˈbɪt/

Apart from the verb *improved*, in which the stress was placed correctly however the /uː/ somehow became a typical /ó/ sound, the sentence was pronounced correctly.

1. He can neither sing nor play the guitar.

/hiː kæn ˈnaɪðə sɪŋ nɔː pleɪ ðə ɡɪˈtɑː**/**

\*/hiː kæn ˈneidər sɪŋk nɔːr pleɪ ðə gɪˈtɑr.

The voiced dental fricative /ð/ is pronounced a bit like /d/ however, the main mistake is in the clear pronunciation of /e/ sound instead of /a/ in the word *neither*. Again, after velar nasal /ŋ/ in the final position a /k/ sound can be heard. Both words *nor* and *guitar* were pronounced in General American and are not regarded as a big mistake.

1. I booked the hotel for our holiday in Australia.

/aɪ bʊkt ðə həʊˈtɛl fɔːʳ ˈaʊə ˈhɒlədeɪ ɪn ɒˈstreɪliːə**/**

**\*/** aɪ ˈbʊkt də həʊˈtɛl fɔːʳ aʊr ˈhɒlɪdeɪ ɪn aʊˈstraːlɪa/

The stress in the word *Australia* is correct, however, the participant again reads the word as she would in Czech. There is additional clearly pronounced /ɪ/ sound in *holiday* instead of schwa. It can be heard that the sequence of the words *for* and *our* was harder to pronounce as it is kind of mumbled, however correctly.

1. The chair was comfortable.

/ðə ʧeə wɒz ˈkʌmfᵊtəbᵊl/

\*/də ˈtʃeəʳ wɒz kɒmfərˈteɪbl/

The *chair* is somewhat pronounced between General American and RP. Instead of the STRUT vowel in *comfortable* an /ɒ/ sound can be heard, the rest of the pronunciation is like the speaker would read the words *come, for,* and *table* together.

1. Do you have a pet rat?

/[duː](https://tophonetics.com/) juː hæv ə pɛt ræt**/**

\*/duː juː hæv ə ˌpɛt ˈrɛt/

As anticipated the TRAP vowel was pronounced as /ɛ/ as it is pronounced the same way in the preceding word *pet* – assimilation.

1. My mother lends me her anti-wrinkle cream.

/maɪ ˈmʌðə lɛndz miː hɜː ˌæntiˈrɪŋkl kriːm**/**

\*/maɪ ˈmɑːdəʳ  lɛnds miː hɜːr ˈɑːntɪ-ˈraɪkl kriːm/

As in previous cases the voiced dental fricative /ð/ is substituted by /d/ in the word *mother*, additionally the STRUT vowel is replaced by a typical Czech /á/ that is way too long. *Her* is pronounced somewhere between General American and RP. The stress in *anti-wrinkle* is placed on both parts of the word equally so it cannot be marked as a primary and secondary stress. Lastly, the velar nasal /ŋ/ completely disappeared from the pronunciation. It can be assumed that the participant was not familiar with this word before.

1. I started using computers in my thirties.

/aɪ ˈstɑːtɪd ˈjuːzɪŋ kəmˈpjuːtəz ɪn maɪ ˈθɜːtɪz**/**

\*/aɪ ˈstɑːʳtɪd juːziŋk kɒmˈpjuːtəz ɪn maɪ ˈθɜːtiz/

The pronunciation of *started* is again somewhere between GA and RP. After the velar nasal /ŋ/ the /k/ sound can be slightly heard. Instead of schwa at the beginning of *computers* a much more rounded open sound can be heard. The pronunciation of the voiceless dental fricative /θ/ in the initial position of *thirties* is almost correctly pronounced. It can be heard that the participant is placing a tongue between her teeth as a makeshift aid that was described in the previous chapters. However, no clear /t, s, z/ sound can be heard. The final part of the word is a bit longer marked by /i/ in the transcription.

1. Thank you very much for the flowers.

/θæŋk juː ˈvɛri mʌʧ fɔː ðə ˈflaʊəz**/**

/ˈθæŋk juː ˈwɛri mʌʧ fɔːr də ˈflaʊərz/

Again, as in the previous sentence, the /θ/ in the initial position is not pronounced one hundred per cent correctly, however, it is very close pronunciation. Both *for* and *flowers* are pronounced in rather American pronunciation. The voiced labiodental fricative /v/ is substituted by the /w/ sound.

1. The wind was calm, so it was quite warm.

/ðə [wɪnd](https://tophonetics.com/) wɒz kɑːm**,**səʊ ɪt wɒz kwaɪt wɔːm**/**

\*/ de wɪnd wɒz ˈkɑːlm, səʊ aɪ wɒz kwaɪt ˈwɔːrm/

The determinant the is mispronounced with the /d/ sound – repeatedly, write in summary.

The /l/ should be silent in the word calm. It was completely changed to I, but this might be an error due to inattention. The pronunciation of warm is the American one. Nice rhythm.

1. There was a bomb report this morning.

/ðeə wɒz ə bɒm rɪˈpɔːt ðɪs ˈmɔːnɪŋ**/**

/ˈder wɒz ə bɒmb rɪˈpɔːt dis ˈmɔːnɪŋk/

*There* is pronounced with /d/ and in GA. The silent /b/ in the final position of the word *bomb*is pronounced. Again, there is a slight /k/ sound after the velar nasal /ŋ/ in the final position. Also, nice rhythm.

Generally, in all cases where *th* was pronounced like /ð/ it was substituted by the /d/ sound. In contrast, the voiceless dental fricative /θ/ in the initial position was pronounced almost correctly but still needed some improvement. However, in the final position, it was substituted by the/s/ sound. A velar nasal /ŋ/ in the final position was always followed by an unwanted /k/ sound. Out of eight silent letter words, half were pronounced correctly.

## Posttest sentences

The same sentences as in the pre-treatment recording were used in the post-treatment. The analysis follows the same structure as the pretest analysis, and the sentences are simultaneously compared to the RP and the pronunciation of the sentences during the pretest recording. Additional colour coding using the blue highlight marks the words where there was a mistake previously and the pronunciation is either correct or at least better than it was in the initial recording.

1. I wish I could visit you in England.

/aɪ wɪʃ aɪ kʊd ˈvɪzɪt juː ɪn ˈɪŋɡlənd/

\* /aɪ wiʃ aɪ koʊld vɪsɪt juː ɪn ˈɪnglənd/

The voiced labiodental fricative /v/ disappeared in the word *wish*. The pronunciation of *could* however still sounds like *cold*.

1. I doubt it.

/aɪ daʊt ɪt**/**

\*/ aɪ ˌdʊbt ˈɪt /

The word *doubt* is pronounced differently than in the initial recording but it is still mispronounced. The silent /b/ is pronounced and the MOUTH diphthong /aʊ/ morphed into a FOOT vowel. Strong stress is placed on both *doubt* and *it.*

1. She had to work until very late.

/ʃiː hæd tuː wɜːk ənˈtɪl ˈvɛri leɪt**/**

\*/ ʃiː hæd tuː wɔːrk ənˈtɪl wɛrɪ leɪt /

The Czech /é/ remain in *had* instead of the TRAP vowel. It feels like the mouth is correctly open, however, the lips are spread too much. The mispronunciation of *work* hasn’t changed. The same applies to the *very* where the voiced labiodental fricative /v/ is still missing. On the other hand, the word *until* is pronounced almost correctly with the schwa in the initial position.

1. Could you buy some vegetables?

/kʊd juː baɪ sʌm ˈvɛʤtəbᵊlz**/**

\*/kɔːld juː baɪ sʌm ˌvɛdʒɪˈteɪbᵊlz/

This sentence contains the same mistakes as the one in the pretest recording.

1. My father hurt his knee.

/maɪ ˈfɑːðə hɜːt hɪz niː/

\*/ maɪ ˈfɑːdər hɑːrt hɪz ˈniː/

In this sentence, the problem with the voiced dental fricative /ð/ remains the same and the sound is substituted with /d/ sound. The mispronunciation of *hurt* messes up the intelligibility as the Czech /á/ substitutes the NURSE vowel resulting in the word sounding like *heart* in American pronunciation. Lastly, the pronunciation of *knee* improved as the /k/ remained silent.

1. Please record the show in the evening.

/pliːz [ˈrɛkɔːd](https://tophonetics.com/) ðə ʃəʊ ɪn ði ˈiːvnɪŋ**/**

\*/pliːz rɪˈkɔːrd də ʃəʊ ɪn də ˈiːvnɪŋk/

The pronunciation of this sentence is identical to the initial recording and still contains the same mistakes. The major one is the mispronunciation of the verb *record* which then sound like the noun in GA.

1. The zoo is closed on Thursday.

/ðə zuː ɪz kləʊzd ɒn ˈθɜːzdeɪ/

\*/də zuː ɪz kləʊzd ɒn ˈtʃuːrzdeɪ/

The participant had problems with the /z/ sounds in the initial recording which disappeared. However, the GOAT diphthong /əʊ/ in *closed* still sounds like the Czech /ou/. Surprisingly the pronunciation of *Thursday* deteriorated as in the initial recording the participant was really close to the pronunciation of the voiceless dental fricative /θ/ in the initial position. Now, not only it sounds like Czech /č/ but also a strong /r/ appeared in the pronunciation.

1. He often listens to the radio.

/hiː [ˈɒfᵊn](https://tophonetics.com/) ˈlɪsnz tə ðə ˈreɪdɪəʊ**/**

\*/ hiː [ˈɒfᵊn](https://tophonetics.com/) ˈlɪsnz tə də ˈreɪdɪəʊ/

The mispronunciation of the voiced dental fricative /ð/ remained the same and is still substituted by /d/ sound.

1. I love both apples and pears, they are my favourite fruits.

/aɪ lʌv bəʊθ ˈæplz ænd peəz**;**ðeɪ ɑː maɪ ˈfeɪvərɪt fruːts/

\*/ aɪ lʌf bɒs ˈæplz ænd peərz ; dei ɑːr maɪ ˈfeɪvərɪt fruːts/

The verb *love* is mispronounced differently than in the initial recording. The STRUT vowel is nice and short but the /v/ in the final position is still a hundred per cent /f/ sound. The voiceless dental fricative /θ/ is pronounced as /s/ and the preceding diphthong /əʊ/ is this time pronounced as the LOT vowel /ɒ/. As a result, the word *both*  sounds like *boss.* A great improvement was observed with the word *pears* which in the initial recording sounded more like *peers.*

1. His shirt is gorgeous.

/hɪz ʃɜːt ɪz ˈɡɔːʤəs**/**

\*/hɪz ʃirt ɪz ˈdʒɔːrdʒəs/

The pronunciation is identical to the one in the pretest recording. The NURSE vowel is not pronounced in the word *shirt*. The /i/ sounds is closer to the FLEECE vowel.

1. I Improved just a little bit.

/aɪ ɪmˈpruːvd ʤʌst ə ˈlɪtl bɪt/

\*/ aɪm ɪmˈprɔːvd dʒʌst ə ˈlɪtl bɪt/

The verb *improved* is mispronounced in the same way as in the initial recording where the GOOSE vowel /uː/ is substituted with the Czech /ó/ sound. It sounds like the participant is pronouncing the word just the way she reads it. Also, there appears an additional /m/ sound at the beginning of the sentence, therefore it now sounds like the participant is saying *I’m.*

1. He can neither sing nor play the guitar.

/hiː kæn ˈnaɪðə sɪŋ nɔː pleɪ ðə ɡɪˈtɑː**/**

\*/hiː kæn ˈneːdr sɪn ˈnɔːr pleɪ ðə gɪˈtɑr/

The pronunciation of the word *neither* changed but not in a good way. The voiced dental fricative /ð/ is pronounced like /d/ and instead of the PRICE diphthong /aɪ/ a long /é/ is articulated. The /k/ sound from *sing* disappeared but a velar nasal /ŋ/ is not pronounced and the word sounds like *sin.*

1. I booked the hotel for our holiday in Australia.

/aɪ bʊkt ðə həʊˈtɛl fɔːʳ ˈaʊə ˈhɒlədeɪ ɪn ɒˈstreɪliːə**/**

**\*/** aɪ ˈbʊkt də həʊˈtɛl fɔːʳ aʊr hɒlɪdeɪ ɪn aʊˈstraːlɪa/

In this sentence, the same mistakes persisted and that is the additional /ɪ/ instead of schwa in *holiday* and the mispronunciation of Australia which is described in the pretest analysis.

1. The chair was comfortable.

/ðə ʧeə wɒz ˈkʌmfᵊtəbᵊl/

\*/də tʃeəʳ wɒz kəmfərˈteɪbl/

The STRUT vowel in *comfortable* changed into a schwa and the rest of the word was pronounced the same as in the initial recording. *Chair* is pronounced with the /r/ sound in the end and is not regarded as a mistake.

1. Do you have a pet rat?

/[duː](https://tophonetics.com/) juː hæv ə pɛt ræt**/**

\*/duː juː hæv ə ˌpɛt ˈrɛt/

Due to the assimilation, the TRAP vowel in *rat* became a DRESS vowel as in the word *pet* preceding it. The same mistake appeared in the pretest recording.

1. My mother lends me her anti-wrinkle cream.

/maɪ ˈmʌðə lɛndz miː hɜː ˌæntiˈrɪŋkl kriːm**/**

\*/ maɪ ˈmʌdəʳ lɛnds miː hɜːr ˈɑːntɪ-ˈwrɪnkl kriːm/

In comparison to the initial recording, the STRUT vowel is correctly pronounced in the word *mother* but the voiced dental fricative /ð/ remained mispronounced as /d/. The TRAP vowel in the initial position of the word *anti*- is articulated as a BATH vowel. The /w/ that should be silent at the beginning of the word *­wrinkle* is pronounced and additionally, the velar nasal /ŋ/ cannot be heard.

1. I started using computers in my thirties.

/aɪ ˈstɑːtɪd ˈjuːzɪŋ kəmˈpjuːtəz ɪn maɪ ˈθɜːtɪz**/**

\*/aɪ ˈstɑːʳtɪd juːsiŋk kɒmˈpjuːtəz ɪn maɪ ˈθɜːtiz/

The pronunciation of the word *using* deteriorated as now a /s/ sound can be heard instead of /z/ and a very clear /k/ sound follows the velar nasal /ŋ/. A slight /t/ sound can be heard at the beginning of the word *thirties,* thesame as in the initial recording. No big change can be observed in this case.

1. Thank you very much for the flowers.

/θæŋk juː ˈvɛri mʌʧ fɔː ðə ˈflaʊəz**/**

/θæŋk juː ˈwɛri mʌʧ ˈfɔːr də ˈflaʊərz/

The voiceless dental fricative /θ/ in the initial position is pronounced with a slight /f/ sound, however, the pronunciation is not completely off. In the word *very* the articulation changed a bit as the sound is somewhere between the voiced labiodental fricative /v/ and the labial-velar approximant /w/.

1. The wind was calm, so it was quite warm.

/ðə [wɪnd](https://tophonetics.com/) wɒz kɑːm**,**səʊ ɪt wɒz kwaɪt wɔːm**/**

\*/ de ˈwɪnd wɒz ˈkɑːlm, səʊ ɪt ˈwɒz kwaɪt wɔːrm/

The whole sentence is pronounced with a nice rhythm and perfect BATH vowel in the word *calm* but the unwanted /l/ sound persisted.

1. There was a bomb report this morning.

/ðeə wɒz ə bɒm rɪˈpɔːt ðɪs ˈmɔːnɪŋ**/**

/ˈder wɒz ə bɒmb rɪˈpɔːt dis ˈmɔːnɪŋk/

This sentence is pronounced similarly to the one in the pretest recording. The silent /b/ in *bomb* is still pronounced, and /k/ sound persisted after the velar nasal /ŋ/ in the final position.

## Results of the analyses

As the sentences for the pretest and posttest were designed with the intention of containing a great number of challenging words, it is no surprise that numerous of them were indeed mispronounced. During the pretest analysis, the problematic areas of the participant’s pronunciation were determined. These areas were then closely monitored during the posttest recording analysis to determine whether there was some progress, the mistakes disappeared, persisted, or what other changes happened thanks to the treatment.

The conclusion of the comparison of the pretest and posttest recordings was divided into three categories: improvements in pronunciation, persisting mistakes that appeared in both recordings and different mispronunciations where the pronunciation, contrary to expectations, regressed compared to the pretest recording. Stress, in both pretest and posttest recordings, was marked at the most significantly stressed words or at words, where the change of stress would mean a mistake. The participant had trouble with stress in many of the sentences as she followed the Czech feature of placing stress on the first syllable and in some sentences, it sounded like she stresses every single word. However, as was stated previously, the suprasegmental features were not the central focus of this research and would require much deeper analysis.

### Improvements

First of all, the biggest improvement that is truly indisputable is the overall confidence and fluency of the participant. While in the pretest recording, a certain level of nervousness could be observed, which resulted in a few unpronounced, forgotten words or a slight stammer. In the posttest recording, there were no mispronunciations due to inattentiveness. The final recording has a nice cadence, and the participant sounds carefree.

Regarding specific mistakes, the interchanging of the voiced labiodental fricative /v/ and the labial-velar approximant /w/ either completely disappeared in the word *wish* or subsided a bit in the word *very.*

Apart from that, the improvement wasn’t huge; the particular words could be pinpointed, and usually, only a part of the pronunciation improved, but another mistake remained, e.g., in *mother*,where the STRUT vowel was pronounced correctly in the posttest recording but the undesirable /d/ sound instead of /ð/ lasted. These words were highlighted with blue colour in the posttest analysis.

### Persisting mistakes

The most noticeable mistake in both recordings was the constant mispronunciation of the voiced dental fricative /ð/ as /d/ which happened basically every time. The situation with voiceless dental fricative /θ/ was in both recordings a bit better, especially in the initial position, where it could be heard that the participant is sometimes placing the tongue between the teeth, which Roach (2009) and Skaličková (1974) describe as the makeshift aid (p. 41, p. 99). The articulation in the initial position was not perfect, but there were usually no clear /t/, /f/ or /s/ sounds.

Another anticipated pronunciation problem that persisted was the /k/ sound after the velar nasal /ŋ/ in the final position. The only exception where the /k/ sound disappeared was in the word *sing* in the posttest recording, but then the velar nasal /ŋ/ was not pronounced correctly either, resulting in the pronunciation of the word *sin* instead.

In several cases with words like *shirt, improved, holiday,* and *Australia,* it seems like the participant was just pronouncing what she read as she would in Czech. Carr (2020) mentions this phenomenon and makes an explanation that learners apply the rules of their L1 or other foreign languages they know to English.

Lastly, many of the words were pronounced with American pronunciation. These words were not necessarily marked as mistakes, as Duolingo teaches the American pronunciation. Also, as the participant was essentially never formally taught English, it can be more confusing because she feels inclined towards the RP.

### Different mispronunciations

These mistakes, in a way, persisted in the recordings, as they were mispronounced in the initial recording and became another, differently mispronounced word in the final recording. Examples would be the words *doubt, hurt, both, neither,*and*anti-wrinkle.*A pattern can be seen in these words, as it seems like the participant is not familiar with them and is not using them daily. Therefore, she does not feel comfortable enough to pronounce them confidently.

## Participant’s personal opinion

As described in the methodology chapter, the participant was provided with a questionnaire containing ten open-ended questions asking her about her personal opinion on Duolingo and her progress. Before the recording, the participant experienced a lot of anxiety as she reported that some of the questions were hard to understand for her and she had to use a dictionary. She was recommended to write down key bullet points that would help her convey the message she wanted. In comparison with the recording of the text that was read, there is an enormous decline in fluency and intelligibility. The participant made a lot of grammatical mistakes; therefore, it was arduous to focus on the correct pronunciation. Additionally, the participant’s vocabulary knowledge, in general, seemed too poor to express her thoughts thoroughly enough to be able to surmise her opinion. The potential cause of these issues could also be the fact that she is learning English exclusively with Duolingo. Therefore, it can be assumed that the app is not a great resource for overall language development. Due to a time constraint, the situation that arose resulted in an additional telephone call where the participant was asked the same question in Czech in order to truly express her opinion. The conclusion of the recording and the additional information collected during the call are presented in the following part.

The participant states that „Duolingo is smart, funny, and a simple application". This statement alone, in terms of intelligibility, would probably cause some confusion if presented to a native speaker because of the choice of adjectives to describe the app. The participant further explains that she does, in fact, mean that Duolingo is user-friendly, easy to understand, entertaining, and game-like. She points out that the application makes her feel like her knowledge is great, so she does not think she is completely stupid. This refers to the reality of Duolingo’s rewards system, which makes the app so popular. The gamified interface awards the user points for virtually the bare minimum, and it also includes additional prizes for fulfilling the tasks.

To answer the question about the participant’s dislikes about the app, she jokingly says that the push notifications are very annoying as they constantly remind her that she has to do the lesson that day. She also dislikes difficult grammar, which can be a result of the fact that Duolingo does not teach grammar explicitly and therefore does not provide any explanation of the structure that is usually required by adult learners. During the interview in Czech, she adds that she is slightly annoyed that she has no control whatsoever over the order of the lessons. She gives the example of having to do present-perfect lessons when she does not understand the grammar or some other, simpler topics that she would consider more beneficial for her language learning journey.

The participant reports that she is sometimes excited and looks forward to the lessons. In this case, she usually does more than is required. If she is lazy, she will do the bare minimum, so she does not lose her streak or freeze it. The best time for her to do the exercises is in the evening when she usually has time, or on a free day. She also adds that she is sometimes motivated to do more of the Duolingo exercises when, for example, she watches a series with subtitles. Then she feels the urge to study harder in order to better understand the series or movies.

Reflecting on her overall progress, the participant feels like her vocabulary has definitely improved but her grammar knowledge has not so much. The participant highlights that she is more confident when given a written text and is required to translate it. However, she lacks confidence in real-life situations and with spoken stimuli that require fast, unprepared answers.

When asked whether she thinks her pronunciation has improved, she says yes. However, she is hesitant to admit it. She thinks that the repetition of the words and sentences out loud has helped with the addition of the short stories that are part of the Duolingo exercises. The participant is very keen on the stories, as they increase her confidence, and she appreciates the self-pacing of those stories because they allow for infinite replays of the sentences. However, when asked if she plans to continue with the Duolingo app, she states that she has made "little or middle progress" and that she finds the app fun to use. In the interview in the Czech language, she clarifies that she does not do Duolingo because she has to; she has no aspiration to become fluent but more as a mental exercise and to slowly increase the foundation of her English language knowledge. She perceives Duolingo as the easiest option to do at least something. Lastly, she adds that she is not that skilled to determine what she would change in the application.

# Discussion

These results build on existing evidence of the positive effects of Duolingo on students’ vocabulary knowledge as well as an increase in their confidence. However, the environment in which Duolingo is used is a huge factor in determining the possible positive outcomes. While previous research presented in Chapter 3.5 focused on using Duolingo in an academic environment or as part of the classroom experience, these results demonstrate the use of Duolingo as an exclusive resource for language learning. The differences suggest that the application itself might not be self-sufficient for self-learning users as the ultimate learning platform. This is in line with the limitations of the application that were suggested by Lotherington (2016), Murdoch (2023), as well as Ravenscraft (2019).

Some of the limitations and drawbacks of this study need to be addressed. First and foremost, this study has only one participant. Initially, there was intended to be a second participant, a 31-year-old doctor who has received some formal education in English but never felt confident with her speaking skills. Therefore, she decided to practise with Duolingo. Regardless, she recently had a baby, so language practise went aside as her priorities changed, and she withdrew from the idea of participating in the research. Since the implementation of GDPR principles, it is harder than ever to get all the necessary approvals and consents from participants in research, especially since there is no financial motivation. Despite this impediment, thanks to the study, more in-depth and detailed observations could have been made, including the personal opinions and thoughts of the participant. Additionally, the inclusion of other participants would have unnecessarily complicated the research, as the comparison of two people is almost impossible, let alone when they have different educational backgrounds.The second drawback was the participant’s health complications during the treatment period when she injured her head and was forbidden to use any electronics for a prolonged period of time, which slowed down and caused some setbacks in the treatment. This is unfortunately an unforeseen complication that could not have been anticipated or prevented.

Lastly, the duration of the treatment can also be seen as a limitation. Three months can be sufficient time to allow great improvement in various areas of language learning. Yet, it needs to be taken into consideration that every learner is different and progresses at a different pace. The three-month-long period of treatment and its results could be used as a pilot for another round of continuous, longer research.

Future studies should take into account the rapid development of the Duolingo application, as foreshadowed by Swecker et al. (2021), which could change the way users are interacting with the application and receive feedback on their spoken production. The introduction of the isolated pronunciation practise for users of Apple devices might indicate the first step and could bring interesting results in additional research. Finally, different learning styles among adult false beginners represent another thought-provoking area of research. Duolingo is widely considered to be a very entertaining and motivating application. Nevertheless, the spaced repetition, inability to choose the order of the topics of the lessons, or mostly written input might be more beneficial for a particular group of learning styles than for another.

# Conclusion

This thesis aimed to examine the pronunciation progress of a Czech adult false beginner learner of English with the use of the Duolingo application over the course of three months. The research questions were as follows:

1.     How does the pronunciation of adult false beginner develop over three months of using Duolingo for thirty minutes a day?

2.     What are the challenges faced by an adult false beginner in improving their English pronunciation skills through Duolingo?

3.     What is the participant’s opinion on Duolingo and their subjective assessment of progress?

The research was conducted by using pretest and posttest recordings of a set of twenty sentences that were designed to contain preassumed typical errors of Czech speakers of English. Both of the recordings were phonemically transcribed and compared to each other and the correct pronunciation. Furthermore, the participant was asked to record herself answering a set of ten open-ended questions about her perception of Duolingo and her progress.

The results showed a great deal of progress in the participant’s confidence and fluency when reading out loud. However, both of the recordings contained a lot of the common pronunciation errors that persisted after the treatment and other mispronunciations specific to the particular participant. This research clearly illustrated that despite Duolingo’s breakneck development, the application is nonetheless heavily vocabulary-oriented, and the assessment of speech production is suppressed. Another challenge that the participant faced was the lack of human interaction and more real-life, relevant situations and, therefore, her inability to confidently respond to unexpected stimuli as well as simply express her opinion comfortably in English. The participant's lack of confidence was evident in the third recording, which resulted in an additional interview in the Czech language over the phone as she was not able to fully express her feelings due to her limited vocabulary knowledge. The participant felt like she progressed, not only in pronunciation but also in vocabulary, and she was very keen on some of the features and tips provided by Duolingo. Despite all the challenges and drawbacks, the participant enjoyed her experience with Duolingo and made it clear that she plans to continue her language-learning journey with this application.

While Duolingo is an enormously popular language learning application, it has been suggested that gaining fluency using the app alone is unlikely, particularly given its limited focus on spoken production. To better understand the implications of these results, future studies could address the new features that Duolingo promises as a way to tackle this issue. Another field that could be researched is the intelligibility of these false beginner learners that learn English exclusively using only the Duolingo app.

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1. Pretest and posttest sentences

1. I **wish** I could **visit** you in England.

/aɪ wɪʃ aɪ kʊd ˈvɪzɪt juː ɪn ˈɪŋɡlənd/

Intended problematic words: *wish, visit* = bilabial glide /w/ is articulated as the labiodental fricative /v/ and vice versa

2. I **doubt** it.

/aɪ daʊt ɪt/

Intended problematic words: *doubt* = the consonant /t/ which should be silent is articulated

3. She had to **work** until **very** **late**.

/ʃiː hæd tuː wɜːk ənˈtɪl ˈvɛri leɪt/

Intended problematic words: *work*, *very* = bilabial glide /w/ is articulated as the labiodental fricative /v/ and vice versa + the nurse vowel /ɜː/ is articulated as /eː/, /iː/, /ɔː/ or /aː/; *late* = the diphthong /eɪ/ is articulated as /ej/

4. Could you buy some **vegetables**?

/kʊd juː baɪ sʌm ˈvɛʤtəbᵊlz/

Intended problematic words: *vegetables* = change of stress, mispronunciation

5. My **father** **hurt** his **knee**.

/maɪ ˈfɑːðə hɜːt hɪz niː/

Intended problematic words: *Father* = the voice dental fricative / ð/ is articulated as /d/ or /z/; *hurt* = the nurse vowel /ɜː/; *knee* = the consonant /k/ should be silent

6. Please **record** **the** show in **the** **evening**.

/pliːz [ˈrɛkɔːd](https://tophonetics.com/) ðə ʃəʊ ɪn ði ˈiːvnɪŋ/

Intended problematic words: *record* = can be mistaken with the verb record so the whole pronunciation as well as stress change; *evening* = the nasal /ŋ/ is in the word-final positions articulated as /ŋg/ or /ŋk/

7. **The** **zoo** is closed on **Thursday**.

/ ðə zuː ɪz kləʊzd ɒn ˈθɜːzdeɪ/

Intended problematic words: *zoo* = fixed CZ pronunciation; *thursday* = the voiceless dental fricative /θ/ is articulated as /t/, /f/ or /s/

8. He **often** **listens** to **the** radio.

/hiː [ˈɒfᵊn](https://tophonetics.com/) ˈlɪsnz tuː ðə ˈreɪdɪəʊ/

Intended problematic words: *often, listen* = the consonant /t/ should be silent

9. I **love** both **apples** and **pears**; **they** are my favourite **fruits**.

/aɪ lʌv bəʊθ ˈæplz ænd peəz; ðeɪ ɑː maɪ ˈfeɪvərɪt fruːts/

Intended problematic words: *love* = the labiodental fricative /v/ is articulated as /u/ or /f/ in word-final positions; a*pples* = the short vowel / æ / is articulated as /e/ or / ɑː /

10. His **shirt** is **gorgeous**.

/ hɪz ʃɜːt ɪz ˈɡɔːʤəs/

Intended problematic words: *shirt* = the NURSE vowel /ɜː/ is articulated as the FLEECE vowel /iː/; *gorgeous* – mispronunciation due to the assimilation

11. I improved just a **little bit**.

/ aɪ ɪmˈpruːvd ʤʌst ə ˈlɪtl bɪt/

Intended problematic words: *little, bit* = the KIT vowel /ɪ/ is articulated as the FLEECE vowel /iː/, assimilation

12. He **can** neither **sing** nor **play** **the** **guitar**.

/ hiː kæn ˈnaɪðə sɪŋ nɔː pleɪ ðə ɡɪˈtɑː/

Intended problematic words: *can* = the TRAP vowel /æ/ is articulated as /e/ or /ɑː/; *sing* = the nasal /ŋ/ is in the word-final positions articulated as /ŋg/ or /ŋk/; *play* = the diphthong / eɪ/ is articulated as /ej/; *guitar* = silent word

13. I **booked** the **hotel** for our **holiday** in **Australia**.

/ aɪ bʊkt ðə həʊˈtɛl fɔːr ˈaʊə ˈhɒlədeɪ ɪn ɒˈstreɪliːə/

Intended problematic words: *booked* = instead of the FOOT vowel /ʊ/ the Czech /u/ is articulated, with a more rounded lips; *hotel* = shift of stress; *holiday* = the diphthong /eɪ/ is articulated as /ej/; *Australia* = stress, reading it the same way as they would in English

14. The **chair** was **comfortable**.

/ ðə ʧeə wɒz ˈkʌmfᵊtəbᵊl/

Intended problematic words: *chair, comfortable –* not pronouncing schwa, in *comfortable –* reading what they see = *table*

15. Do you **have** a **pet** **rat**?

/ [duː](https://tophonetics.com/) juː hæv ə pɛt ræt/

Intended problematic words: *have, rat* = the TRAP vowel /æ/ is articulated as DRESS vowel /ɛ/ or BATH vowel /ɑː/; *rat –* assimilation; *have =* the /v/ in the final position is articulated as the voiceless counterpart /f/

16. My **mother** lends me her anti-**wrinkle** cream.

/ maɪ ˈmʌðə lɛndz miː hɜː ˈænti-ˈrɪŋkl kriːm/

Intended problematic words: *mother* = the voice dental fricative / ð/ is articulated as /d/ or /z/; *wrinkle* = /w/ should not be articulated at all, silent word

17. I started **using** **computers** in my **thirties**.

/aɪ ˈstɑːtɪd ˈjuːzɪŋ kəmˈpjuːtəz ɪn maɪ ˈθɜːtɪz/

Intended problematic words: *using* = the nasal /ŋ/ is in the word-final positions articulated as /ŋg/ or /ŋk/; *computer* = stress + the short central vowel / ə/ is articulated as /e/, /a/, /o/…; *thirties* = the voiceless dental fricative /θ/ is articulated as /t/, /f/ or /s/

18. **Thank** you **very** much for **the** flowers.

/ θæŋk juː ˈvɛri mʌʧ fɔː ðə ˈflaʊəz. /

Intended problematic words: *thank*= the voiceless dental fricative /θ/ is articulated as /t/, /f/ or /s/ + the TRAP vowel / æ/ is articulated as /e/ or /ɑː/; *very* = the labiodental fricative /v/ is articulated as bilabial glide /w/

19. **The** **wind** was **calm**, so it was quite **warm**.

/ðə [wɪnd](https://tophonetics.com/) wɒz kɑːm, səʊ ɪt wɒz kwaɪt wɔːm/

Intended problematic words: *wind, warm* = the bilabial glide /w/ is articulated as the labiodental fricative /v/; *calm* = the /l/ sound should be silent

20. **There** was a **bomb** report **this** **morning**.

/ðeə wɒz ə bɒm rɪˈpɔːt ðɪs ˈmɔːnɪŋ/

Intended problematic words: *there* = the voice dental fricative / ð/ is articulated as /d/ or /z/; *bomb =* the voiced bilabial plosive /b/ should be silent; *morning* = nasal /ŋ/ is in the word-final positions articulated as /ŋg/ or /ŋk/

*The, this, they* throughout the sentences = the voice dental fricative / ð/ is articulated as /d/ or /z/

1. Post-test questionnaire

How was your experience with Duolingo?

What do you like about the app/exercises? Give reasons.

Is there something you dislike about the app/exercises? Give reasons.

Which time of the day and circumstances do you find most favourable for practising with Duolingo?

Do you look forward to doing Duolingo, or is it a chore you hate? Give reasons.

In which areas do you feel Duolingo has helped you improve the most?

Do you think your pronunciation has improved?

What methods or activities helped you with pronunciation?

Do you plan to continue with the Duolingo app? Give reasons.

Is there something that you would change or something you miss with Duolingo?

1. Pretest audio recording

This appendix includes the audio recording that was recorded in the pretest phase of the research. It is a recording of the twenty sentences being read out loud by the participant.

The audio recording can be found in the Thesis Archive in the Informational System titled AUDIO\_PRE.aac or is enclosed on the CD-ROM in the printed copy of the thesis.

1. Posttest audio recording

This appendix includes the audio recording that was recorded as a part of the posttest phase of the research. It is a recording of the twenty sentences being read out loud by the participant.

The audio recording can be found in the Thesis Archive in the Informational System titled AUDIO\_POST.aac or is enclosed on the CD-ROM in the printed copy of the thesis.

1. Posttest questionnaire audio recording

This appendix includes the audio recording that was recorded as a part of the posttest phase of the research. It is a recording of the participant reading out loud ten open-ended questions about her perception of Duolingo and answering them from the top of her head.

The audio recording can be found in the Thesis Archive in the Informational System titled AUDIO\_Q.aac or is enclosed on the CD-ROM in the printed copy of the thesis.

1. Despite being listed under the GA, the symbol /ɛ/ is used throughout the work, to avoid confusion with the Czech /e/ [↑](#footnote-ref-2)
2. an automated message sent by an application to a user when the application is not open [↑](#footnote-ref-3)