TRABAJO DE FIN DE GRADO

THE ACQUISITION OF VOWEL LENGTHENING IN EFL SPANISH SPEAKERS OF ADVANCED ENGLISH

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Dedicatoria

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Abstract

This work deals with the assimilation of vowel lengthening in EFL Spanish speakers at an advanced level, and tries to determine if the explicit teaching of phonetics contributes to the acquisition of this trait. Finally, it aims to analyze the students' own perception of their level of oral competence, and to observe if both realities correspond one each other.

Este trabajo trata de descubrir si los estudiantes hispano-hablantes de inglés en un nivel avanzado han asimilado la duración de las vocales inglesas, y de determinar si un aprendizaje específico en fonética contribuye a la adquisición de este rasgo. Por último, pretende acercarse a la propia percepción de los estudiantes sobre su nivel de competencia oral, y observar si ambas realidades se corresponden o no.

Key words: *pronunciation, phonetics, vowel lengthening, EFL, explicit teaching.*

Palabras clave: *pronunciación, fonética, duración vocálica, inglés como lengua extranjera, enseñanza explícita.*

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Section 1. Introduction

Behind the need to communicate, it is
the need to share. Behind the need to share,
it is the need to be understood.
Leo Rosten

This study deals with vowel length in English. Our aim is to analyze, through production and discrimination tasks, whether this phenomena is properly assimilated by Spanish advanced EFL students. It concerns with the different contextual processes that can involve a change in the duration of vowels.

In English, differences in vowel length are important because they usually play a role in the discrimination of minimal pairs like *bet-bed*. English has a complex vowel system, with around twenty vocalic realizations, in contrast with the five Spanish vocalic sounds. This fact is responsible (among others) for the Spanish-speaking English students difficulty in correctly pronouncing the English language.

English vowels can also be affected by many processes depending on their position at the syllable, the word stress or the vocalic environment. There are phenomena as neutralization, L-coloring, devoicing, etc. However, the two relevant processes that we are going to analyze in this study are lengthening and shortening processes which are related with the surrounding consonants.

This complexity in the English vowel system generates many problems for Spanish students, since it is far removed from its own vowel system. With this study, we will try to clarify whether Spanish-speakers EFL learners truly had acquired during their formal learning process the capacity of producing and detecting vowel length variation.

To accomplish this objective, we will first address in the theoretical framework several important issues that may affect the level of linguistic competence of the students: theories of second language acquisition, some personal and social variables that affect the ability to learn foreign languages, the importance of Phonetic Training and the state of the teaching of pronunciation in the foreign language class in the Spanish education system.

With all this theoretical support, we will design and execute a practical analysis consisting in two main tasks and a questionnaire in order to take into account information regarding motivation. The first one will be a production task in which participants will have to pronounce different single words which are expected to be shortened or lengthened according to their consonant environment and in comparison with the rest of words. In the second one, a discrimination task, students will hear two pairs of words with similar characteristics in which the duration of the vowel will be the key to differentiate them.

We will also include a questionnaire with a double objective: to know (1) how the formal learning stage in phonetics and phonology has been in the participants, and (2) how is their own perception of their oral competence in English.

With the data provided by both sections, we will try to analyze whether in fact the participants have acquired the capacity to produce and distinguish the phonetic aspects of the English vowel system.

Section 2. Theoretical Framework

Introduction

Before presenting the study and its results, I would like to address the different factors than can intervene in the linguistic performance of the students: (1) different studies about the acquisition of English vowels and their duration regarding EFL Spanish speakers, (2) the sociolinguistic variables that can influence the process of acquiring a foreign language and (3) the importance of a good pronunciation teaching method, focusing on the problems of Spanish speakers when it comes to addressing the different phonetic realizations of the English vowels.

Acquisition of English vowels and their duration.

The acquisition of English vowels and their qualitative and quantitative features are a problem for L2 learners because of the differences among the vocal systems. In the case of Spanish speakers, who are the focus on this study, Iverson and Evans (2009) proposed an explanation for which the acquisition of English vowels supposes a great problem. In the experiment that they developed, Spanish and German speakers were subjected to several sessions of auditory training for English vowels. The election of these two groups of participants was due to their vowel inventories: five Spanish vowels in contrast to the eighteen German ones. They found that the larger the vowel inventory, the easiest the learning.

In a study carried out by House (1961), he tried to demonstrate that English vowel lengthening is, firstly, "a part of the phonology of the language and is learned by speakers" when we deal with [± tense] or [±voiced] features. Secondly, he wanted to show that length is also a matter of the articulatory process when the vowel is in an open syllable or before fricative consonants. He worked with voiced and voiceless stops, affricates and fricatives.

Following this idea, Cruttenden (1962) stated that long vowels are fully long when they are closed by a voiced consonant, but shortened when the next one is voiceless, always in accented syllables. Furthermore, Lehiste (1976) demonstrated what House (1961) predicted: not only the [± voiced] feature indicates length, but also the kind of consonant influences: vowels are shortened before voiceless stops and lengthened before voiceless fricatives and nasals, and voiced stops and affricates.

Flege and Munro (1995) studied how English and EFL Spanish speakers perceive English vowels. For both groups, the distinction had to do with vowel height. However, in native English speakers this was correlated with duration. While this group also made the distinction between front and back vowel sounds, the Spanish was not able to interpret such feature so easily.

Studies like the one developed by Kondaurova et al (2008) have tried to demonstrate that the distinction among English vowels relies on vowel duration instead of on vowel quality when dealing with non-native speakers. To confirm or reject this hypothesis, they worked with Russian, Spanish and American native listeners. While the American participants showed few reliance on duration, the non-native participants were entirely influenced by such aspect. In a second experiment, Spanish speakers were the ones who depended the most in duration "as a cue to postvocalic consonant voicing" (Kondaurova et al., 2008).

All these previous researches give us the basis for our study: (1) first of all, the acquisition of the English vowels supposes a trouble for Spanish L2 English speakers due to the small Spanish vowel system, (2) secondly, the postvocalic consonant varies vowel length, (3) and finally, we have to take into account not only the [± voiced] feature, but also the type of consonant and vowel we have according to the place of articulation.

Learning Variables on L2 Performance

As in the practical application of this work we will analyze the L2 performance of some English learners at an advanced level, we will review some variables that can influence that performance in order to generate a concrete context for the results. These

variables will be analyzed through the different questions addressed in the questionnaire that participants will have to answer at the end of the task.

Since Carroll and Sapon began their studies on aptitude in 1959, many variables have been proposed to explain individual differences in each person's learning ability. We are going to outline three large groups of variables that influence notably the ability to speak a second language correctly, and some of the tools that have been designed to measure their influence.

Foreign Language Aptitude.

Also known as "language learning ability", it has been the most widely studied variable. Carroll and Sapon (1959) designed a cognitive test named MLAT (Modern Language Aptitude Test) which allowed the measurement of the ability that learners had to learn a language. This is interesting for our research since it was based on four abilities -the phonetic coding ability, the grammatical sensitivity, the rote learning ability, and the inductive language learning ability- and participants can be more successful in ones than in others.

Nowadays, most foreign language aptitude researchers place more emphasis on other variables that derive from the importance given to the communicative approach in language teaching.

In 2000, Ehrman, M., Grigorenko, E., & Sternberg, R. designed an aptitude test called the *Cognitive Ability for Novelty in Acquisition of Language* applied to foreign language performance. This test has its theoretical background in Stenberg's *Theory of Successful Intelligence* (1999), which includes cognitive skills necessary not only for learning in the school environment, but also for its implementation in everyday life. Thus, the CANAL-FT test studies "several processes that are operationalized at the lexical, morphological, semantic and syntactic level and in two language modes of input and output: visual and oral", (Dörnyei, 2014). The test also measures working and long-term memory and its impact in second language acquisition.

Foreign Language Anxiety.

In the sixties, Gadner and Lambert (1963), established that variables as motivation, attitude, self-confidence or anxiety did have an important impact in language acquisition. This idea was then developed by Stephen Krashen in his Monitor Theory through his Affective Filter Hypothesis. Following this theory, Cope, J., Horwitz, E. K., & Horwitz, M. B. (1986) designed the Foreign Language Anxiety Scale (FLCAS), which over time has served to demonstrate in several studies that a high level of anxiety during the learning stage has negative effects on the acquisition of a second language.

Language learning strategies.

This category encompasses all those strategies used by the teacher to facilitate the learning process of the student. Their two main objectives are: to make the student better understand all aspects related to the target language and to equip those students with more difficulties with tools to reach the desired level of knowledge.

More specifically, in the last years, several inventories of general language learning strategies have been developed, such as the Oxford's Strategy Inventory for Language Learning (1990) and other L2 performance scores. The research community agrees that the use of well-chosen learning strategies, adapted to the students individual factors such as proficiency, age, nationality, course level or gender, help to significantly improve the L2 performance.

All these variables will influence the ability of students to internalize the characteristics of the foreign language, which the teacher should have into account when addressing their learning process.

Phonetic training and its impact in vowel pronunciation

Now that we know all the factors that can affect the learning in English of our students, we will focus on the pronunciation. According to Aliaga-García (2013), in her

article *The role of phonetic training in L2 speech training*, states that Scientific literature has shown that, although English is taught at earlier ages and that many people spend years of their lives perfecting a second language, the results in terms of pronunciation are not satisfactory.

Aliaga-García (2013) pointed to factors like L1 background, amount of L1 and L2 use, length of residence in a L2-speaking environment, gender, language learning aptitude and motivation as determinants for the correct pronunciation of a foreign language.

In her article, Aliaga-García (2013) develops a study on the role of phonetic training in the English class, and the results of its practical application for six weeks with English learners whose first language was Spanish (along with Catalan).

One of the variables addressed in the study was the difficulty of Spanish students in differentiating and pronouncing the different vowels in English since each of them has multiple phonic realizations depending on factors like stress, word position or following consonants. In such cases, the vowel length varies. This fact has an important impact on the learning process for the student, since, if not acquired, it will limit both his ability to understand the foreign language and his ability to make himself understood. Aliaga-García (2013)´s study was designed to measure the impact of speech training on the student's ability to correctly understand and pronounce vowels in English.

The results offered a very significant reality: although the ability of students to perceive variations in the qualities of each vowel, their ability to produce such variations did not improve.

According to Rigol (2005), what her students declare to expect in the foreign language class was to improve their oral skills. However, although students want to improve their oral skills, they generally achieve better results in written language.

Rigol stated that "as teachers, we must be concerned with this contrast in the mastery of the various skills, equalize mastery in oral and written skills. We are convinced that improving the results in oral language depends directly on a change in teaching of pronunciation" (Rigol, 2005, p.3).

She also points out that one of the reasons may be the lack of manuals and adequate teaching materials. Her thesis is that the manuals continue to support the introduction of L2 sounds through written materials, instead of using oral exercises. Thus, "general manuals introduce the sounds of the new language through the alphabet presented in the first lesson and of auditory exercises so that the student learns the letter-sound correspondence" (Rigol, 2005, p.8). This way of approaching the pronunciation training is contradictory, since if what you want to achieve is to improve the oral competence of your students, you cannot base your teaching solely on written content.

Rigol (2005) proposes the immersion of the pupil in the target language, giving them a chance to listen to the language correctly used and to create for them a relaxed environment in which listening and speaking the foreign language are keys to acquire its domain, which, of course, always demands a correct pronunciation .

EFL Student´s view on the Teaching of Pronunciation

After analyzing the researchers' perspectives on the state of phonetic training in our educational system in the previous section, it can be very instructive to know what students think about it.

Benzies (2013) carried out a study based on the opinions of the students of the Degree of English Studies about the teaching of pronunciation during their studies.

Benzies (2013) wants to know the opinion of her students after verifying in several studies that "pronunciation still is a minor part in EFL classes in Spain" (Benzies, 2013 p.41). Specifically, she refers to a study by Henderson et al. (2012, 2013) that, having as a reference guide the English Pronunciation Teaching in Europe Survey (EPTiES), analyzes some aspects of teaching pronunciation in European countries, including Spain. She obtained five main conclusions which are, first of all, that "students have few opportunities to practice this language outside the EFL lessons". Secondly, "the main teaching methods used are based on recognizing phonetic symbols and ear-training exercises". Thirdly, "pronunciation is only practiced in 25% of weekly sessions". Then,

"the main materials used are textbooks. Social media, blogs or forums are not employed". Finally, "teachers receive limited training in pronunciation".

With this information, Benzies (2013) wanted to know the opinion of her own students. In her study, more than 222 students underwent a survey in which they valued parameters like the amount and type of exposure to English outside the classroom, the student´s attitude to teaching/learning pronunciation, the current role of pronunciation in their EFL cases, their preferences and main difficulties in learning pronunciation, and the role of pronunciation in their materials.

The main conclusion of the study is that the students perceive that the role of pronunciation in specialized English studies is still insufficient and had a general negative opinion on this matter, citing as reasons that (1) "perceptive skills are emphasized more than productive ones", and although students are constantly exposed to listening to English, they have not enough opportunities to produce the oral language; (2) there is not enough time devoted to "the teaching and learning of pronunciation in their EFL classes"; (3) the range of pronunciation activities offered is monotonous; (4) the students are barely tested for their pronunciation skills; (5) the method used to correct their mistakes is also monotonous; (6) "EFL textbooks contains insufficient pronunciation tasks", and the ones that appear are repetitive and not very helpful. (Benzies, 2013).

After reviewing these results, we can obtain two very clues for our study: first, that the time devoted to teaching pronunciation is considered insufficient by both teachers and students themselves, a reality that is likely to have an important impact on their pronunciation; and second, that the materials used for phonetic training seem obsolete, leaving aside more modern and effective options such as blogs, podcasts, the use of songs or phonetic transcriptions.

Throughout the next section, I will carry out a practical exercise focused on analyzing the difficulties that Spanish students have when approaching the different English vocalic realizations and their changes because of the several consonant processes.

Section 3. Methodology

In this section of the work we will review some factors affecting vowel length. Before explaining the practical experiment, we will focus on analyzing the extent to which Spanish-speakers of advanced English level have acquired or not a correct pronunciation of the English vowel system.

Approaching to English Vowel Sounds

General Overview.

Yoshida (2014) describes vowels as "the rounds in which the air stream moves up from the lungs and through the vocal tract very smoothly; there's nothing blocking or constricting it. In general, every word has a vowel sound. Vowels are the 'heart´of syllables" (p.1)

She also states that, even among some varieties of English such as Australian, British or American, vowels diverge much more than consonants as we can see in table 1. The same occurs within these varieties with their different dialects. That is why, in order to master the English language, students must pay close attention to specific features of vowels.

People with no phonetic instruction, assume that English only has five vowel sounds: <a>, <e>, <i>, <o> and <u>. That is the case, for example, of Spanish. However, these are vowel letters, and not vowel sounds. In English, each vowel letter has different allophonic variations, which in many cases, will mean the difference among two words such as *but* /bʌt/ and *bat* /bæt/. Either way, each vowel sound may be written with different letters. The sound /ɒ/ may be written as <o> in *pond* or in *long,* but also as <a> in *want* or in *wand.* There is not a one-by-one correspondence between letters and sounds. In fact, in English, there are more vowel sounds than vowel letters, and this is a problem,

focusing in this study, for Spanish speakers when they are learning a language as it has been mentioned previously.

According to Yoshida (2014), "describing vowels is trickier than describing consonants. The tongue is floating freely around the mouth, not touching other parts of the vocal tract. This makes it harder to describe exactly what´s happening in the mouth." (p.2). She also explains that traditionally, when describing vowels, we should take into account physical aspects like the tongue position, the lip rounding, the muscular tenseness that vowels involve and if they are simple, glided or diphthongs. However, in the experiment, we will focus only in vowel processes of shortening and lengthening.

Vowel length.

When we hear about "long vowels" and "short vowels", we may assume that, for example, two vowels with the same quality <a> as, for example, /a:/ in *bard* and /æ/ in *bat* only differ in their duration. However, the difference between those vowels refers to tongue position, tenseness or laxness, etc. Students must pronounce both sounds with their respective qualities, and not only vary the length of the vowel. However, for our practical study, we will only focus on those factors that affect the length of English vowels.

Factors affecting vowel duration.

The duration of each vowel can vary noticeably: all vowels can be lengthened or shortened according to their environment. We will point out two important factors that will determine the length of vowels: the following sound and the stress.

The following sound.

Researchers like Gimson (1962) have demonstrated that vowels sounds are shorter before voiceless sounds and longer before voiced sounds, or when they are at the end of the word, that is, at the coda of an open syllable. Nonetheless, Lehiste (1976) indicated that there are also subtle variations in vowel length before different kinds of

voiced sounds: they are longer before nasals and liquids, and shorter before voiced stops, affricates and fricatives.

Table 1. Vowels variations in English accents. Retrieved from:
http://www.omniglot.com/writing/english.

	AmE	AuE	BrE	CaE	IrE	NZE	SAE	ScE	WeE
ash	æːʃ	æʃ	æʃ	aːʃ	ɛʃ	æːʃ	æːʃ	aʃ	äʃ
all	ɑːɫ	ɔːɫ	ɔːɫ	ɒːɫ	ɔːɫ	ɔːɫ	oːɫ	ɔːɫ	oːɫ
father	ˈfäðɚ	ˈfäːðɐ	ˈfɑːðə	ˈfɑˑðɪ	ˈfäːðɚ	ˈfäːðɐ	ˈfɑˑðɐ̈	ˈfäˑðɐɪ	ˈfɑːðɐ
better	ˈbɛɾɚ	ˈbɛɾɐ	ˈbɛtə	ˈbɛɾɪ	ˈbɛʔɾ̩ɚ	ˈbɪɾɐ	ˈbɛt̬ɐ	ˈbɛtʰɐɪ	ˈbɛt̬ɐ
day	dɛɪ	dɛɪ	dɛɪ	dɛɪ	deː	dɛɪ	dɛˑе̣	deː	dɛɪ
earth	ɚˑθ	ɜ̣ːθ	ɜːθ	ɚˑθ	ɚˑθ	ɵ̈ˑθ	ɜ̣ˑθ	ɛˑɹθ	ɵ̈ːθ
drink	dɹɪŋkʰ	dz̩ɪŋk	dɹɪŋkʰ	dɹɪŋkˀ	dɹ̈ɪ̈ŋkʰ	dzɪŋk	dɹ̩ɪŋkʰ	dɹɪŋkʰ	dɹɪŋk
eat	iˑtʰ	ɪit	iˑtʰ	iˑt	it	ɪit	iˑtʰ	iˑtʰ	iˑt
top	tʰɑp	tʰɒp	tʰɔp	tʰɒpˀ	tʰɔˑp	tʰɒp	tʰɒp	tʰɔpʰ	tʰɒp
four	foˑɹ	foː	foː	foˑɹ	foˑɚ	fɔ̣ɐ	foː	foˑɐɹ	foː
foot	fʊt	fʊt	fʊtʰ	fʊt	fʏt	fʊt	fʊtʰ	fɐtʰ	fʊt
goose	gʊus	gÿˑs	guˑs	geʊs	gʏs	gʉˑs	gʉˑs	gʉs	guˑs
blood	bɫʌd	blɐ̣d	blɐ̣d	bɫẍd	bɫʌd	blɐ̣d	blɜ̣d	blẍd	blɐd
bone	bʌˑʊˑn	bɜ̣ʉˑn	bɐʊˑn	boʊn	boːn	bɜ̣ʉˑn	bɜ̣ʉˑn	boɵn	boːn
cow	kʰæʊ	kʰæʊ	kʰaʊ	kʰaʊ	kʰɐˑʏˑ	kʰaʊ	kʰa̠ö	k̬ʰɐuˑ	kʰɐuˑ
nail	neˑẍɫ	nɛɪəɫ	nɛ̣ɪɫ	neˑɐɫ	neˑəɫ	nɛɪʊ	neˑəɫ	neˑẍɫ	neːl
bite	bäitʰ	bäɪt	bäɪtʰ	bẍɪt	bɐit	bäɪt	bäetʰ	bẍitʰ	bɐit
ear	iˑɚ	iˑɐ	ɹ̩ə	iˑɪ	iˑɚ	iˑɐ̈	iɐ̈ˑ	iˑəɹ	jɵ̈ː

The same changes appear in words like *spent* and *spend*, even if there is another sound between the vowel and the final consonant –in this case the letter <n> (Yoshida, 2014). It is important for students to be able to hear and produce this variation in the duration of the vowel, since, other way, it could be hard to differentiate final voiced and voiceless sounds.

The distinction of a minimal pair of the *bet-bed* type can be complicated for non-native speakers, while the contrast between /t/ and /d/ can be extremely subtle when acting allophonic variations such as devoicing of the *d*, or the realization of *bed* with a non-audible release. In such cases, the difference between the two words rests essentially on the fact that the *bed* vowel is substantially longer than the *bet* vowel, since it undergoes an extension process to be a short vowel closed by a sound consonant.

Relative to the duration of vowels, Wiik (1965) showed that this varies according to the following consonant by measuring in csec in accented monosyllables the length of the vowel. He demonstrated that both, short and long vowels, are longer when they precede a voiced consonant than when they precede a voiceless one.

Table 2. Duration of vowels in different phonetic contexts (Wiik, 1965)

	+ voiced consonant	*+ voiceless consonant*
Short vowel	17.2	10.3
Long vowel	31.9	16.5

Stress.

The features that have been mentioned above regarding vowel length apply in stressed syllables where vowel sounds usually last longer. This is a factor used to underline the stress of the word. For the practical study, we are going to focus on the aspect described in the first section, namely, we are going to consider only plosives at the onset and the coda of the production task and only at the coda of the discrimination one.

Broad vs Narrow transcriptions.

As we have pointed out in the previous section, the variation in vowel duration may be the only key to distinguish two words. However, that variation in duration is sometimes so slight that it is difficult to perceive or produce for non-native speakers. Therefore, the use of phonetic transcriptions is very useful to teach students to distinguish these phenomena.

Henry Sweet (1877) proposed a transcription system that "accurately indicates the endless shades of difference between every speech sound that can be found in the languages of the world." (Cited on Dresher, 2015, p.6). He was also the first one to categorize phonetic transcription into two types.

'Narrow' (now more commonly called phonetic) transcription is universal and aims to record sounds in as much detail as possible; 'Broad' (now called phonemic) transcription records only the differences in sound that are distinctive in the language being represented (Dresher, 2016, p.8).

Narrow transcription, although it needs a greater knowledge, can show the learners of a given language how it is exactly produced the right sound and what processes can affect every vowel or consonant. It also allows a deeper analyses when the focus is on the variation among languages. The disadvantage of this kind of transcription is that it is much harder to learn as mentioned above: narrow transcription involves the knowledge of a larger number of symbols which are surely unfamiliar to non-experts. For the purpose of this work, we will use narrow transcriptions, to mark the variation of length of the vowel.

Section 4. Experiment

Participants.

In order to carry out the research, there were a total amount of 24 participants (see table 4) divided into four different groups, each of them composed of the same number of men and women.

On the one hand, we have groups 1 and 2 which are students of English Studies degree in the University of Valladolid where the enrollment in a subject regarding advanced practical aspects of Phonetics and Phonology is not compulsory. Group 1 is formed by undergraduates enrolled in this subject dealing with advanced training in Phonetics and Phonology. Group 2 is also formed by undergraduates, but who have received little advanced training in Phonetics and Phonology years ago. Their experience in this field was limited to a subject during the first quarter of freshman year.

On the other hand, Group 3 is formed by students with an advanced level of English but whose college career is not part of the academic branch of languages. They all have passed English level tests such as PET, KET, FCE, CAE or CPE. Group 4 consists of high school English teachers. According to their testimony, they did not receive advanced training in Phonetics and Phonology during their degree. They only received the basic notions which were mainly based on practical sessions.

We have to take into consideration some variables concerning participants. First of all, except for a boy from group 2, whose mother tongue is Bulgarian, all participants were Spanish speakers. Secondly, Groups 1 and 2, whose participants are the youngest of the sample, began their training in English at a very young age. Finally, the teachers in group 4, much older than the students in the other groups, began their training in English much later than groups 1 and 2. According to their personal testimony, retrieved from the answers in the attached questionnaire, at that time the educational system gave relatively little importance to the pronunciation of their students.

Table 3. Mean age of participants.

	Male	**Female**	**Mean age**
Group 1. Mean age	23.3	22	*22.26*
Group 2. Mean age	26	22	*24*
Group 3. Mean age	25	31.3	*28.2*
Group 4. Mean age	37.3	25	*36.15*

Materials

To carry out the study, three different tasks have been developed: a questionnaire, a discrimination task and a production one, designed to measure how participants perceive and produce vowel sounds in English.

Discrimination task.

The discrimination test is composed of fifteen minimal pairs (see table 4) whose only difference is the consonant at the coda, which makes the length of the vowel different in each of the terms that make up the minimal pairs. These minimal pairs are affected by the factors addressed in *factors affecting vowel duration*. For example, the distinction of a minimal pair of the *cat-cad* type can be complicated for EFL students because the contrast between /t/ and /d/ can be subtle when acting allophonic variations such as devoicing of the *d*. In this case, the difference between the two words rests on vowel length. With this task, we want to check whether the students are able to detect the vowel length variation and, consequently, to identify correctly the word produced. To prepare and analyze the audios, we have used two programs that allow recording and visualization of spectrograms. They are C*ool edit* and *Audacity*.

Table 4. Minimal pairs used in the discrimination task.

	[æ]	**[e]**	**[ɪ]**	**[ɒ]**	**[ʌ]**	
[p-b]	tap-tab	rep-reb	lip-lib	bop-bob	tup-tub	5
[t-d]	cat-cad	ret-red	lit-lid	got-god	cut-cud	5
[k-g]	lack-lag	beck-beg	pick-pig	hock-hog	buck-bug	5
						15

Production task.

The production task is composed of a list of 15 words whose vowels are influenced by their consonant environment, as in the discrimination task. What is expected is that the students pronounce them correctly in terms of duration (see table 5).

Table 5. Words used in the production task

	[æ]	**[e]**	**[ɪ]**	**[ɒ]**	**[ʌ]**	
[p-b]	gab	debt	tip	cop	tub	5
[t-d]	cad	pet	bid	pod	gut	5
[k-g]	pack	beg	kick	dog	buck	5
						15

Questionnaire

In addition to these two practical tasks, the participants will answer a series of qualitative questions (see questionnaire in section 7.1 in *Appendix*). What we want to analyze with this test is, on the one hand, how has been the training in Phonology and Phonetics of the participants, and on the other hand, to analyze to what extent they are aware of the impact that knowledge has in their pronunciation.

Procedure

The order of the exercises were as follow: first, the production task, then, the discrimination task and, finally, filling out the questionnaire. After much thought, we

decided on this particular order, doing the production first to avoid that the discrimination put the participants on the track of what was sought. It prevents the exercise of discrimination from becoming a training for the production.

The production task was carried out individually in a relaxed environment. Before we started, we checked the audio and recording quality and that each participant had completed the personal data requested at the beginning of the first page. To each of the questionnaires given to every participant, we assigned a number that also served to name their corresponding audio track. At the beginning of each track, the person in charge of the recording added, before the participants' answers, their identification, using the following formula: "Participant number x, group x, sex: male / female, Word number 1", and after that formula, participants had to pronounce every word on the list. For production, they had three attempts, in case they perceived that they had not pronounced it correctly.

Once the test has been realized, the analysis consisted on measuring the length of vowels in every word by using spectrograms in *audacity*. We enlarged the word's spectrogram to a size in which the division among different sounds was visible. Then, we separated the vocalic sound to obtain the duration. The words were divided into *expected long vowels* and *expected short vowels*.

The discrimination task was carried out in groups. Before we started, we made sure that the participants listened to the audio perfectly. With the list of minimal pairs in front, participants could listen to the audios up to 3 times as follows: the first word corresponding to the first minimal pair was heard up to three times, so that they chose the one they thought they were perceiving, and then we add a beep to announce the audio of the next pair of the list.

Finally, participants filled the question task. This part had to be completed in up to three minutes to force them to respond with their first choice.

Results

In relation to the personal information, we have obtained that a 54,2% of participants began their phonetic instruction at the age of 18 and all of them started before they were 23 years old. That means that there are not great differences in such aspect. According to the duration of the training, all participants have studied English Phonetics and Phonology around one year. Although the majority liked this kind of subject, 53% of participants said that it is not an easy content. 72% declares their desire to improve their pronunciation, whether to sound like a native (48%) or to pass a level exam (52%).

It is remarkable to say that the 100% thinks that Phonetics and Phonology is important and necessary at all levels of L2 instruction (from the very beginning of learning) and that it is not sufficiently taught neither done in the most efficient and comprehensible ways in elementary and high schools.

Apart from that, only 8,3% of participants do not watch TV series, films, etc. in English. Out of the 91,7% that does it, a 58,3% uses subtitles (41,7% of participants uses English subtitles. That is, the majority needs L1 subtitles).

Regarding the production task (see table 6), after measuring vowels with *Audacity,* we have observed that all groups produce a very similar duration in short vowels. Only group 4 obtains the exact duration proposed by Wiik (1965) (10.3), although this is just a guideline, since Wiik (1965) analyzed vowel duration in use, that is, analyzing people having conversations. The rest of the groups makes short vowels shorter, except for group 1, which lengthens them in comparison to Wiik´s values (1965).

According to lengthened short vowels, group 1 and 4 are the ones that lengthen vowels the most. However, they are much shorter than expected. All these differences in length with the values proposed by Wiik may be because in his research words were used in conversation, in contrast to this research in which they appeared in isolation. Anyway, lengthened was present in every group.

We see that the short vowels expected to be longer due to their consonant at the coda, have an average duration of 12.57 msec, in contrast to those in which the duration does not have to change because the following consonant is voiceless (10.23 msec). In

comparison to Wiik (1965), we observe that advanced speakers of English produce a lengthening of the vowel, but not the necessary one. Concerning this aspect, group 1 and group 4 have been the ones that were nearer to the length proposed by Wiik (1965) (see graph 1), the supposed native duration.

Table 6. Duration of vowels in the task.

	Short vowels (+ voiceless)	**Short vowels (+ voiced)**
Group 1	10.5	13.2
Group 2	10.1	12.6
Group 3	10.02	11.4
Group 4	10.3	13.1
Average	*10.23*	*12.57*

Graph 1. Duration of vowels during the production task.
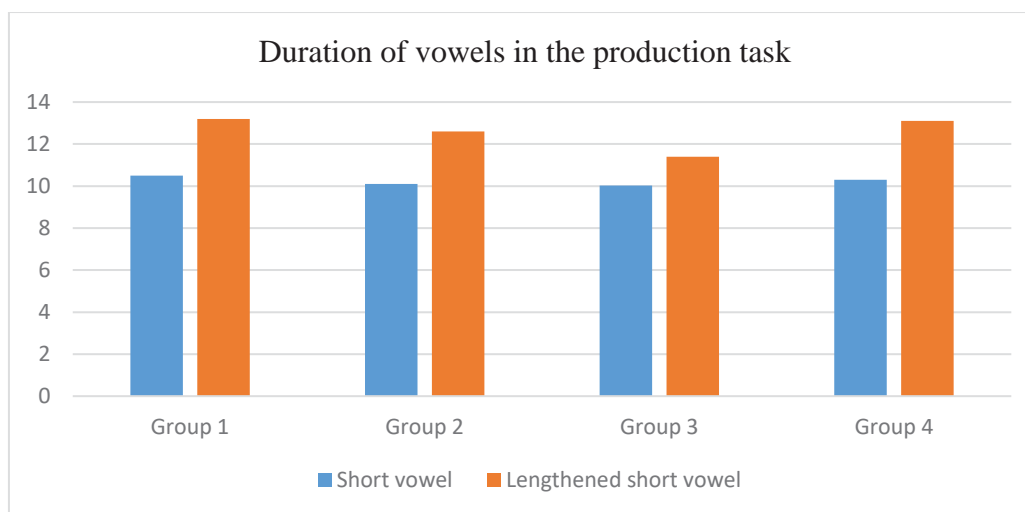
Graph 2 shows that the length difference in the pair /t/ - /d/ is the most acquired by participants, except for group 4, who produced more often the differences in length in /p/ - /b/. The pair with the lowest rate of correct length production in all groups was the /k/ - /g/ minimal pair.

Graph 2. Differences in length between consonantal pairs.
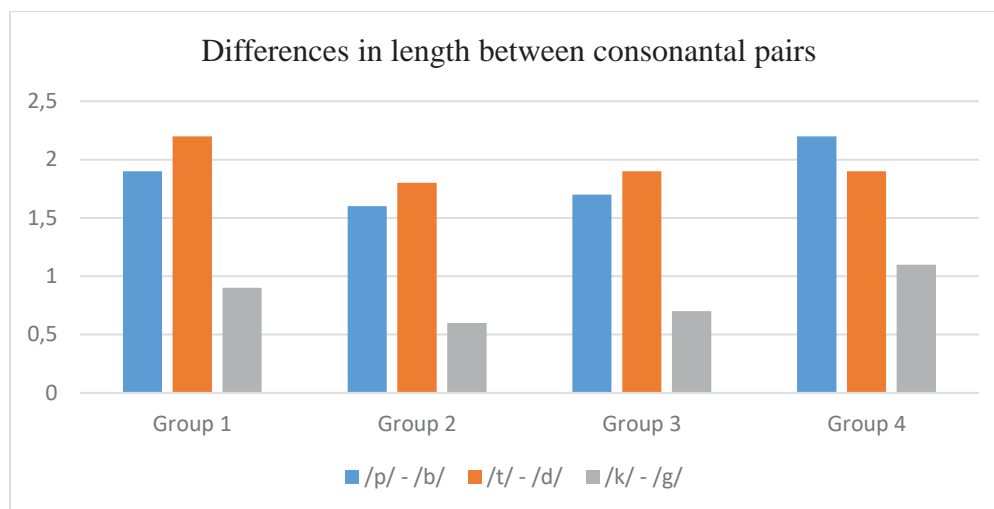
Taking a look to vowels in table 7, we observe that the shortest vowel is [ɒ] and the longest is [æ]. However, the one that has a more similar length to Wiik's is [e], which is also the vowel that has a pronunciation nearer to the Spanish <e>. Group 4 has achieved the expected duration and Group 1 has exceeded it.

Table 7. Duration of short vowels in the production task

	[æ]	[e]	[ɪ]	[ɒ]	[ʌ]	Mean average
Group 1	11.45	10.68	10.83	9.61	9.93	*10.5*
Group 2	11.2	10	11.13	9.2	9.01	*10.10*
Group 3	11.13	9.98	10.82	9.13	9.04	*10.02*
Group 4	11.3	10.5	10.68	9.25	9.8	*10.30*
Mean average	*11.27*	*10.29*	*10.86*	*9.29*	*9.44*	

In the next table, we have the different durations of lengthened vowels and their average. None of them achieve Wiik (1965)'s length in vowels followed by a voiced consonant. Although, as it is mentioned above, Wiik (1965)´s measures are just guidelines in conjunction with the previous results of short vowels. The longest vowel is

[æ·] and the shortest is [ɒ·]. Concerning group's results, we can mention that the groups that have better acquired vowel lengthening are group 1 and 4.

Table 8. Duration of lengthened vowels in the production task.

	[æ·]	[e·]	[ɪ·]	[ɒ·]	[ʌ·]	Mean average
Group 1	14.17	13.08	13.93	11.97	12.88	*13.2*
Group 2	14.21	13.02	12.89	11.94	10.95	*12.6*
Group 3	12.95	12.32	12.63	9.21	10	*11.4*
Group 4	14.38	13.29	14.23	11.67	11.98	*13.1*
Mean average	*13.92*	*12.92*	*13.42*	*11.19*	*11.45*	

Finally, in the following table, we can see the differences between short and long vowels. The vowels that are produced with a more clear difference in length are /æ/ and /e/. Participants produce differences in these two vowels more often than the rest. The ones in which they have not made almost differences in length are /ɒ/ and /ʌ/.

Graph 3. Differences in length between short and lengthened short vowels.
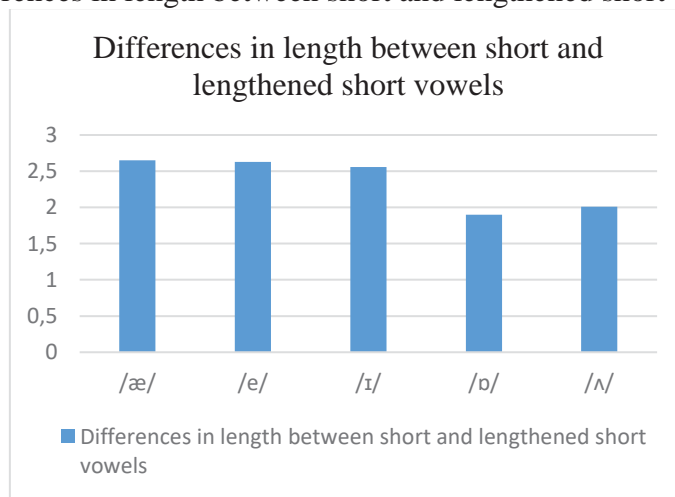
The results of the discrimination task are as follows: in group 1, the ratio of correct answers is 78%, and 69% in group 2. Group 4 also approached them, with 65% of well-identified words, and group 3 remained at 42%.

Graph 4. Amount of words well-discriminated.
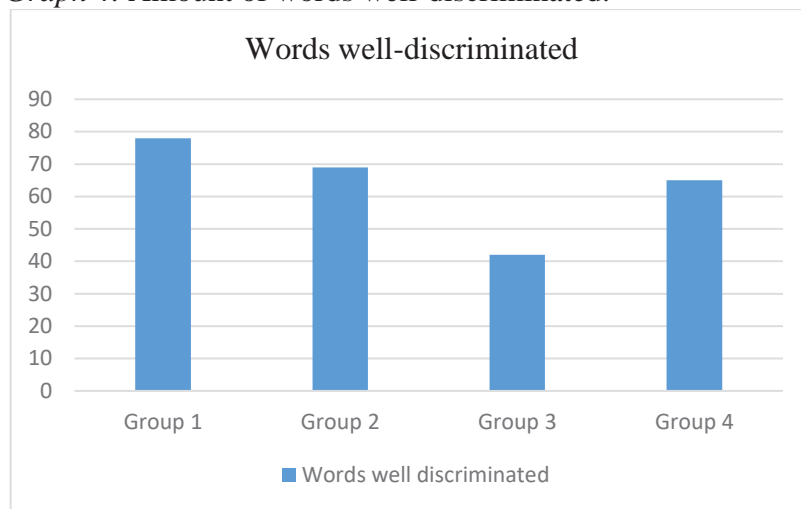
As it occurred in the production task, participants were less accurate in those pairs ending in /k/ and /g/ consonants (see graph 5) and more accurate in the /t/ - /d/ pairs. The more precise groups according to consonants are group 1 and group 4 as in the production task. In relation to vowels (see graph 6), participants had also more trouble with /ʌ/ and /ɒ/ and discriminated more easily /æ/ and /e/.

Graph 5. Percentage of accurateness in the discrimination of words

Percentage of accurateness in the discrimination of words
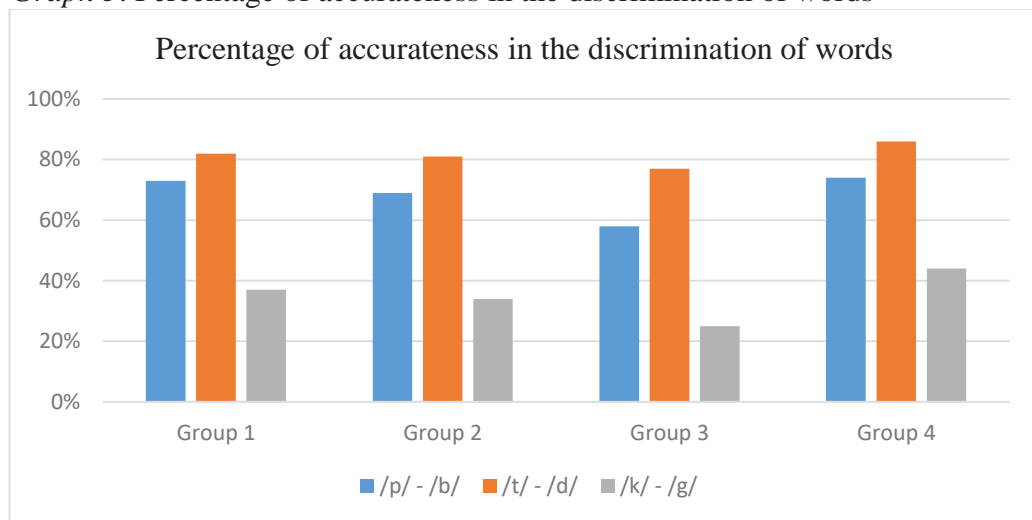
Graph 6. Percentage of accurateness in the discrimination of vowels

Percentage of discrimination accurateness in vowels
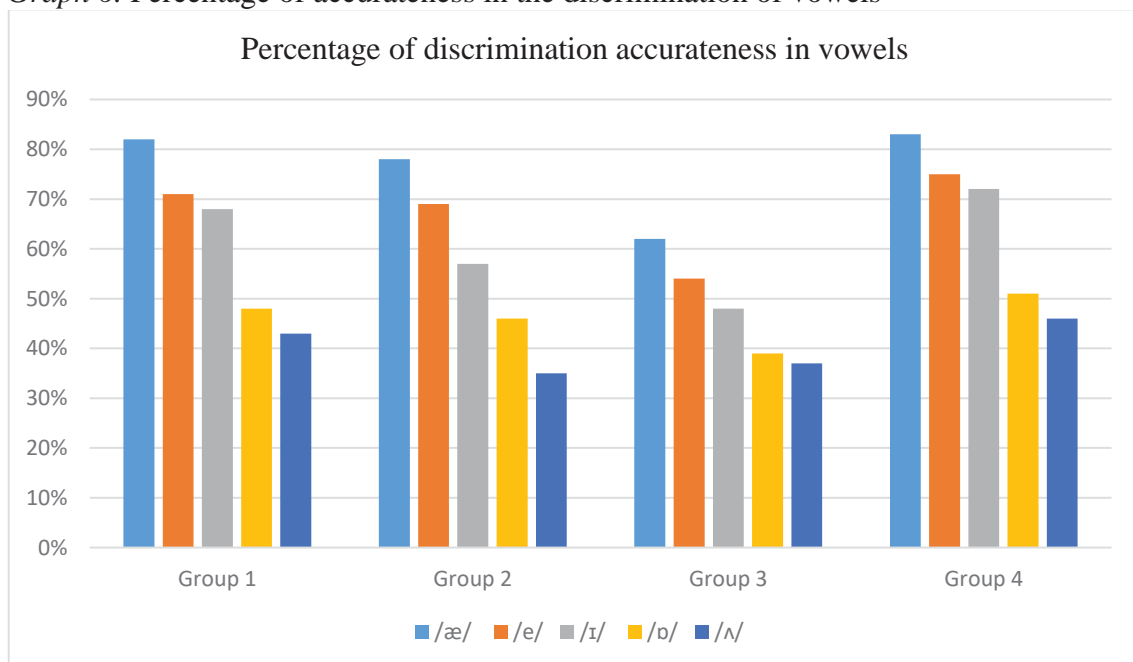
Section 5. Discussion and conclusion

We can draw several conclusions from the results obtained in the experiment which can give us ideas for further research and future teaching methods. Firstly, it is remarkable that after analyzing individually vowels and consonants, in both cases and in all groups, the easiest sounds are pronounced in the front part of the mouth in the case of vowels ([æ] and [e]) or in a bilabial position in consonants ([p], [b]). In this line, the most complicated ones are those pronounced at the back or in a velar position: [ʌ], [ɒ], [k], and [g]. The fact that the degree of complexity to pronounce or discriminate sounds goes from a front position to a back one might suggest that the trouble that EFL Spanish speakers have with pronunciation involves aspects regarding physiology like the place of articulation and tongue position, the vocal fold adjustments, etc.

Because of the results collected in which we have seen what vowels are more difficult for the different types of learners, we can propose a teaching method based on the primary instruction of the front sounds, which, in addition, are more similar to the Spanish ones. Considering the qualitative questions that participants answered, teachers may spend more time in teaching phonetics and phonology. Since Phonetics and Phonology is seen as a difficult, but important and necessary task, further research could be developed regarding the teaching method that deals with such skill.

Taking into account the age at which participants began the phonetic instruction and that the results cannot be considered strictly negative, we may take a stance against the several studies and researches that are in favor of the known critical period.

In the production task, all groups present a phenomenon of lengthening or shortening of the vowel depending on the consonant that follows it. It is demonstrated that, although the contrast between the words of the proposed minimal pair does not occur as markedly as in Wiik (1965)'s predictions –which were based on a conversational context in opposition to the isolated words used in this research-, it is positive that all participants -students and teachers- are aware that the length of the vowels undergoes variations, and that they strive to translate it into their linguistic productions. Regarding

the differences in length that the participants have produced in the diverse consonantal pairs, we have observed, as House (1961) and Flege & Munro (1995), that not only the [± voiced] aspect is relevant, but also the tongue position, the place of articulation, and the rest of physiological features.

Although it is true that English pronunciation can be complicated for a speaker of Spanish, especially its vocal system and the processes of lengthening and shortening of vowels, phenomena that do not exist in our language, it is hopeful than EFL students get to be conscious about it.

With respect to the discrimination task, the results are notably better, especially in groups 1 and 4, with a high success rate. This may indicate that EFL students have a better ability to identify sounds in English than producing them. The reason for this difference can be drawn from the answers to the questionnaires: while the participants complain that they have few opportunities to practice the language outside the classroom, they declare that the vast majority usually listen to music in English and watch original films. Therefore, their ear is better trained than their speech organs.

Despite of these results, better than I expected, the answers to the questionnaires are not optimistic, on the other hand. Although in recent years the new communicative approach in language teaching aims at the oral competence of students, according to the participants' testimonies, Phonetics and Phonology are not given the same importance as Grammar or Lexicology, a circumstance that generates that advanced students in English perceived their own training as insufficient. It is striking that they themselves are aware of their lack of competence and try to cover it in their leisure time by watching movies or listen to music in English. I think it is important that educational authorities echo this reality and begin to stress the importance of pronunciation training in university curricula and in other educational systems like academies since the group of participants that had more difficulties in both tasks of production and discrimination was group 4, the one formed by high certificated English speakers.

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Section 7. Appendix

Model of the tasks developed during the research

Personal data

Group: ☐ 1. Undergraduate (instructed in Phonetics and Phonology).

☐ 2. Undergraduate (not instructed in Phonetics and Phonology).

☐ 3. High proficiency L2 English speaker.

☐ 4. High School teacher.

Sex: ☐ male ☐ female   **Age**: _____

Initiation in phonetic instruction: _____ **Duration of training in Phonetics and Phonology:** _____

Production task

PRODUCTION TASK: Pronounce the following words.

1. GAB
2. DEBT
3. TIP
4. COP
5. TUB
6. CAD
7. PET
8. BID
9. POD
10. GUT
11. PACK
12. BEG
13. KICK
14. DOG
15. BUCK

Discrimination task

DISCRIMINATION TASK. In every pair, circle the word that you hear.

1. TAP / TAB
2. RET / RED
3. PICK / PIG
4. LACK / LAG
5. LIP / LIB
6. CAT / CAD
7. REP / REB
8. BECK / BEG
9. HIT / HID
10. BOP / BOB
11. CUT / CUD
12. HOCK / HOG
13. GOT / GOD
14. TUP / TUB
15. BUCK / BUG

Questionnaire

QUESTIONNAIRE. Answer the following questions with YES or NO.

1. Do you like Phonetics and Phonology? _____
2. Do you find English pronunciation easy? _____
3. Have you studied or practiced English pronunciation by yourself (outside the academic context)? _____
4. Do you consider Phonetics and Phonology important and necessary at all levels of L2 instruction (from the very beginning of learning)? _____
5. Is Phonetics and Phonology sufficiently taught in elementary and high schools? _____
6. Is Phonetics and Phonology taught in the most efficient and comprehensive way in elementary and high schools? _____
7. Do you watch TV series, films, documentaries, etc. in English? _____
8. If yes, how often? _____ How long? _____
9. Do you use subtitles? _____ If yes, are they in English? _____

Answer the following questions about yourself with true (T) or false (F)

1. I study English to pass a level exam.
2. I like or would like to pass for a native among L1 English speakers.
3. I do not care about pronunciation. I know L1 English speakers can understand me.
4. I study English just because it is important in professional arrangements.
5. I like my own accent. I do not need to sound like a native.
6. Native speakers of English comment that my foreign accent is "cute". I don't have any motivation to change that.
7. I need more contact with native speakers to achieve a native-like pronunciation.
8. I would have liked to receive more training in pronunciation to have passed the job interview.
9. I would like people to think I am a L1 native English speaker.

Classification of words in the production task

Table 9. Classification of words in the production task

Long vowels					Short vowels				
[ae·]	**[e·]**	**[ɪ·]**	**[ɒ·]**	**[ʌ·]**	**[ae]**	**[e]**	**[ɪ]**	**[ɒ]**	**[ʌ]**
[gae·b̥ˀ]	[dᶻe·b̥tˀ]	[bɪ·d̥ˀ]	[pʰɒ·d̥ˀ]	[tˢʰʌ·b̥ˀ]	[pʰaekˀ]	[pʰetˀ]	[tˢʰɪpˀ]	[kʰˣɒpˀ]	[gᶻʌtˀ]
[kʰˣae·d̥ˀ]	[be·g̊ˀ]		[dᶻɒ·g̊ˀ]				[kʰˣɪkˀ]		[bʌkˀ]
2	2	1	2	1	1	1	2	1	2
8					7				
15									

Words classified by type of consonant

Table 10. Words classified by type of consonant in the production task

Onset						Coda					
voiced			voiceless			voiced			voiceless		
[b]	**[d]**	**[g]**	**[p]**	**[t]**	**[k]**	**[b]**	**[d]**	**[g]**	**[p]**	**[t]**	**[k]**
beg	debt	gab	pet	tip	cop	gab	cad	beg	tip	pet	pack
bid	dog	gut	pod	tub	cad	tub	bid	dog	cop	gut	kick
buck			pack		kick	debt	pod				buck
3	2	2	3	2	3	3	3	2	2	2	3
7			8			8			7		
15						15					

Classification of words in the discrimination task

Table 11. Classification of words in the discrimination task

LONG VOWELS					SHORT VOWELS				
[ae·]	**[e·]**	**[ɪ·]**	**[ɒ·]**	**[ʌ]**	**[ae]**	**[e]**	**[ɪ]**	**[ɒ]**	**[ʌ]**
[lae·g̊ˀ]	[re·d̥ˀ]	[hɪd̥ˀ]	[bɒ·b̥ˀ]	[tˢʰʌ·b̥ˀ]	[tˢʰaepˀ]	[repˀ]	[pˢʰɪkˀ]	[gɒtˀ]	[kˣʰʌtˀ]
[kˣʰae·d̥ˀ]	[be·g̊ˀ]		[hɒ·g̊ˀ]				[lɪpˀ]		[bʌkˀ]
2	2	1	2	1	1	1	2	1	2
8					7				
15									

Classification of words by type of consonant

Table 12. Classification of words by type of consonant in the discrimination task

ONSET		CODA	
VOICED	**VOICELESS**	**VOICED**	**VOICELESS**
lag	cad	lag	tap
red	hog	cad	rep
beg	hid	red	pick
bob	tub	beg	lip
rep	tap	hid	got
lip	pick	bob	cut
got	cut	hog	buck
buck		tub	
8	7	8	7
15		15	