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FACULTAD DE LENGUAS

A COMPARISON OF ENGLISH-SPANISH SOUND SYSTEMS IN A GROUP OF STUDENTS OF THIRD SEMESTER LEI-FACULTAD DE LENGUAS STUDENTS

A thesis submitted to the School of Languages for the degree of

LICENCIATURA EN LA ENSEÑANZA DEL INGLÉS

by

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ABSTRACT

The following study discusses the comparison between the sound systems of English and Spanish in order to identify the pronunciation patterns that a native Spanish speaker follows in the articulation of English words. Furthermore, the aim of the study is to show if exposure to English language influences participants' phonological acquisition of English as a Foreign Language.

With respect to carrying out the appropriate research methodology, a case study was used in order to apply the instruments to the subjects that were utilized to compare the sounds produced when a native English speaker and a group of ten native Spanish speakers read aloud a word list in order to identify the pronunciation patterns and to compare native pronunciation patterns with non-native pronunciation patterns. Therefore, in order to answer the research questions, the data was collected and analyzed to discuss the results and conclusions.

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CHAPTER I: INTRODUCTION

Sometimes pronunciation in English results a little difficult for people who are not familiar with the pronunciation patterns of the language. Also, because people follow mother tongue pronunciation patterns when articulating sounds in a foreign language. The process of English as a Foreign Language (EFL) acquisition is markedly different from native-language patterns. Exposure to English language and contact with native speakers is important to improve pronunciation (Krashen, 1982). It is related that contact with English language influences the way a non-native speaker pronounces in a better way English language than people that are not exposed to the language.

1.1 Statement of the topic

Talking about phonetics and phonology it is assumed that Spanish speakers that learn English as a foreign language frequently, make less mistakes than others that are not so exposed to English language. To illustrate, English sounds produced by a group of LEI-students of third semester in Facultad de Lenguas of the Benemérita Universidad Autónoma de Puebla will be compared with a native English speaker in order to identify the pronunciation patterns of each, and to prove if his/her first language influences in the foreign language acquisition.

1.2 Purpose of the study

The aim of the present study is to compare the sound systems of English and Spanish, in order to identify the pronunciation patterns that a group of native Spanish speakers follow in the production of English words. In addition, the purpose of the study is to show if exposure to English language influences participants' articulation of English words.

1.3 Research questions

This project sets out to answer the following research questions:

1. How many English-Spanish cognate words do participants pronounce following mother tongue pronunciation patterns?
2. Which English sounds are mispronounced?
3. Does exposure to English language influence participants' articulation?

1.4 Significance of the study

As it is known there are many studies in the phonetics and phonology field; therefore, this research looks for a way to expand the information of English and Spanish sound systems. In addition, it will contribute to develop the wide research in the phonological acquisition of English as Foreign Language. Also, this project will supply to the English Language Teaching with information of the comparison between English-Spanish sound systems in order to help LEI-students to improve their pronunciation in English and to help them to teach their own students strategies to pronounce better when they become teachers.

1.5 Definition of key terms

The following terms are essential for the theoretical framework of this research.

Articulate. (Of speech) clearly pronounced. (Ogden, 2009).

Consonant. Sound which involves a narrowing in the mouth, causing some obstruction of the airstream. (Avery, 1992).

Foreign language. This term refers to a language which is not spoken in the local community. (Cohen, 1998).

Mistake. A word, figure, sum, etc. that is not correct: spelling mistakes. (Carter, 2012).

Pronunciation. The way in which a language is spoken. The way in which a person produces the sounds of a language. (Roach, 2000).

Stress. The terms ‘stress’ and ‘accent’ can be used to refer to the same thing in English: syllables that are more prominent than their neighbors, (Hammond, 1999).

Syllable. The concept of the syllable is an important one in the sound structure of Spanish, as many phonological processes in this language are best seen in the light of syllable structure, (Harris, 1983).

Vowel. Sound produced by air passing unobstructed through the mouth. (Avery, 1992).

CHAPTER II: LITERATURE REVIEW

In this chapter it is reviewed relevant literature in different topics. It is divided into two parts. In the first section, it is explained the phonetics and phonology areas and it is discussed the sounds of English and Spanish with their organs of speech, vowels and consonants, place and manner of articulation of each language system. In the second section, it is described the phonological acquisition in a first language and a foreign language, and the chapter concludes by pointing out about social and linguistic factors that influence phonological acquisition of a foreign language.

2.1 Phonetics and Phonology

Phonetics and Phonology are two similar areas of linguistics which study the same object, the sound of speech (Roach, 2000).

Phonetics studies the characteristics of any speech sound. This means that phonetics studies the language and the place where these sounds are articulated.

Phonology studies the variations of meanings when the words are pronounced expressing a different or alike sound. Phonology may be defined as the study of the systems of linguistically significant sounds (Clark, 1995).

It is impossible to investigate phonetics and phonology without confronting theoretical issues. In this, phonetics and phonology are not different from other fields of study. Indeed, it is part of

the definition of a science – taking the word 'science' in its widest sense to include such areas as psychology and sociology as well as biology and physics – that it is characterized by theoretical reflection.

Phonetics and phonology influences the theoretical connections between aspects of speech and other scientific fields of study, partly because of various practical motives that have drawn on or stimulated speech research. Phonetics is very important to study because it is necessary to communicate with people around us (Hawkins, 1992).

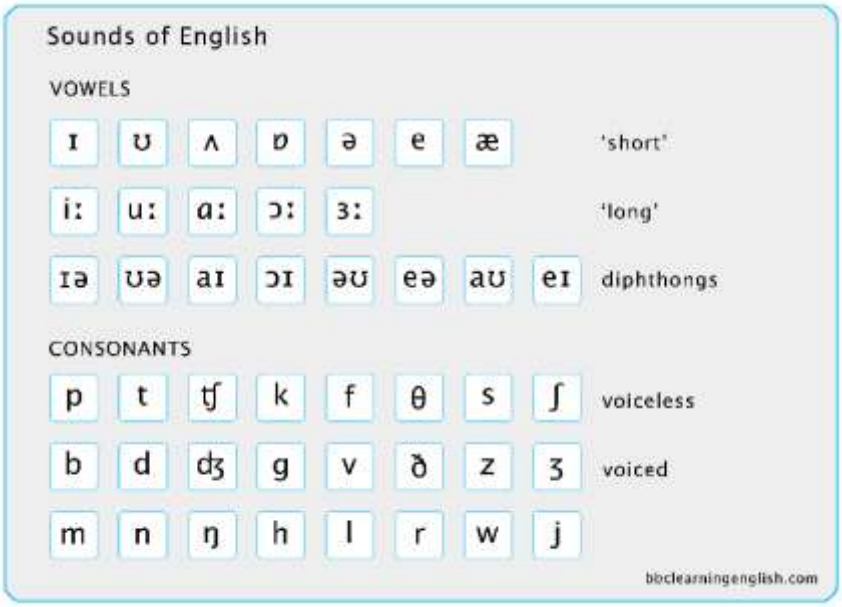
Language teaching has also contributed to and profited from phonetics and phonology. Many works on English phonetics and phonology have been written for the benefit of foreign learners, for example. The fact that English spelling is not a direct reflection of pronunciation has undoubtedly been an important factor here and has led to the publication of pronunciation dictionaries and other guides to pronunciation, both for native speakers of English and for English learners. Information about speech and pronunciation is thus of some general interest to users of language and of specific importance to those engaged in recording, describing and teaching languages (Hansen & Zampini, 2008).

2.2 Sounds of English

As it can be read in most of English dictionaries, when a word is looked up in a dictionary it could be seen that next to the word there is another 'word', sometimes is almost the same as the word, but put (or written) around with two sloping lines / /. In this case a sound was found when the word English was looked up, it was /ˈɪŋ.glɪʃ/. This sound is compound of phonemes which are vowels and consonants, /ɪ/, /g/, /l/ are found in the alphabet plus some phonemes that are not

in the alphabet as, /ŋ/, and /ʃ/. The study of how sounds are produced and how the position of the mouth can be changed to produce different sounds is called phonetics (Avery, 1992). As well, these sounds are represented by the International Phonetic Alphabet (IPA). The following figure represents the phonetic symbols used in English.

Figure 1. Sounds of English (adopted from Bellem, 2009)

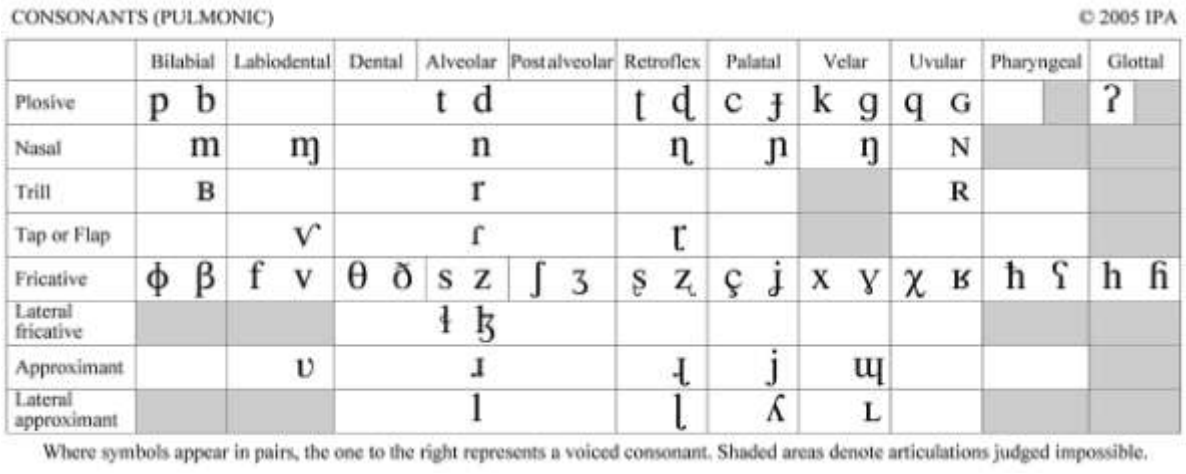


As shown in Figure 1there are sounds in English which are vowels and consonants listed in the following way: vowels and consonants, vowels are divided in three groups, the first group, *short* in which are seven short vowels and their examples, the second group, *long* in which are five vowels and finally, the group of *diphthongs* which are grouped in eight diphthongs used in this research. On the other hand, there are the consonants, which are grouped in two ways; the first group of consonants is *voiceless* which contains eight consonants and their examples, the second group and longer of consonants are *voiced* which contains sixteen consonant sounds used in this research.

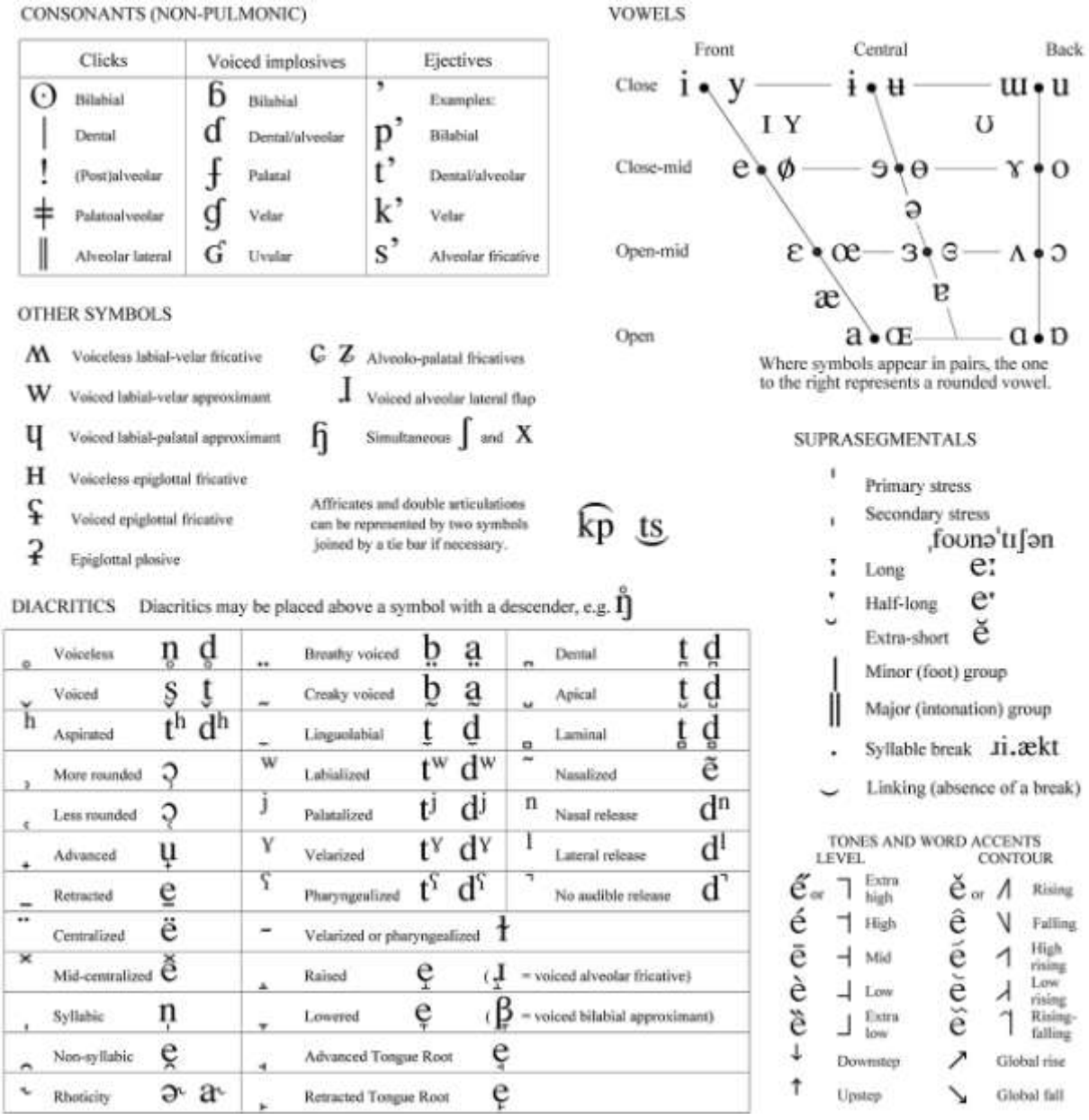
2.2.1 International Phonetic Alphabet (IPA)

The community of researchers interested in the study of the sounds of speech communication, through the (International Phonetic Association, 2005), has developed an alphabet, known as the International Phonetic Alphabet or IPA, whose goal is to allow for the transcription of the sounds of any language in a way that will be unambiguous and readily understandable to all phoneticians, whether or not they know the language in question Hualde (2005, p.15).As shown in Figure 2 the International Phonetic Alphabet is an alphabetic system of phonetic notation based primarily on the Latin or Roman alphabet. It was devised by the International Phonetic Association as a standardized representation of the sounds of oral language. The IPA is used by lexicographers, foreign language students and teachers, linguists, speech-language pathologists, singers, actors, constructed language creators, and translators (McMahon, 1996).

Figure 2. International Phonetic Alphabet (adopted from International Phonetic Association, 2005)



Occasionally letters or diacritics are added, removed, or modified by the International Phonetic Association. As of the most recent change in 2005, there are 107 letters, 52 diacritics, and four prosodic marks in the IPA chart.



The existence of this alphabet is very convenient. In principle, it permits anyone who has mastered this alphabet to read IPA transcriptions in any language with a certain degree of

accuracy, that is, making all distinctions that are linguistically relevant to native speakers of the language.

Table 1. Phonetic symbols used in this research (adapted from Avery1992, p. 27)

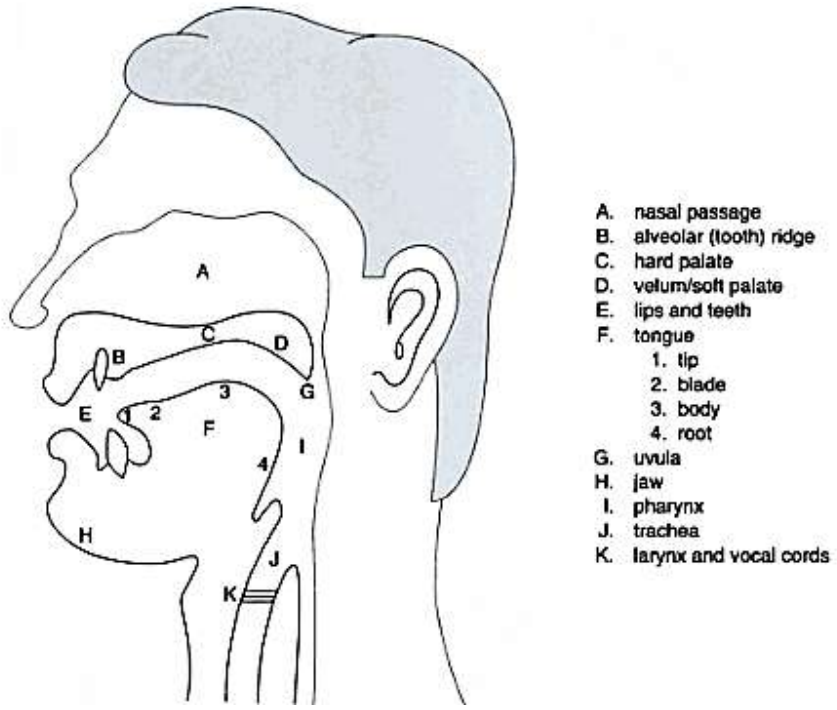
Vowels		Consonants	
Short		***Voiceless***	
/ɪ / as in 'is'	/ɪz/	/p/ as in 'important'	/ɪmˈpɔr·tənt/
/ʊ/ as in 'now'	/noʊ/	/b/ as in 'because'	/bɪˈkəz/
/ʌ/ as in 'love'	/lʌv/	/ʧ/ as in 'much'	/mʌʧ/
/ɒ/ as in 'lot'	/lɒt/	/k/ as in 'question'	/ˈkwes·tʃən/
/ə/ as in 'about'	/əˈbaʊt/	/f/ as in 'fun'	/fʌn/
/e/ as in 'many'	/ˈmeni/	/θ/ as in 'think'	/θɪŋk/
/æ/ as in 'bad'	/bæd/	/s/ as in 'speakers'	/ˈspiː.kərs/
		/ʃ/ as in 'English'	/ˈɪŋ·glɪʃ/
Long			
		Voiced	
/iː/ as in 'me'	/miː/		
/uː/ as in 'too'	/tuː/	/b/ as in 'basic'	/ˈbeɪ.sɪk/
/ɑː/ as in 'start'	/stɑːrt/	/d/ as in 'do'	/duː/
/ɔː/ as in 'thought'	/θɔːt/	/dʒ/ as in 'language'	/ˈlæŋ.gwɪdʒ/
/ɜː/ as in 'prefer'	/prɪˈfɜːr/	/g/ as in 'get'	/get/
		/v/ as in 'live'	/lɪv/
Diphthongs		/ð/ as in 'that'	/ðæt/
		/z/ as in 'music'	/ˈmju·zɪk/
/ɪə/ as in 'near'	/nɪər/	/ʒ/ as in 'pleasure'	/ˈpleʒ·ər/
/ʊə/ as in 'cure'	/kjʊər/	/m/ as in 'statement'	/ˈsteɪt·mənt/
/aɪ/ as in 'I'	/ɑɪ/	/n/ as in 'lesson'	/ˈles·ən/
/ɔɪ/ as in 'choice'	/ʧɔɪs/	/ŋ/ as in 'learning'	/ˈlɜr·nɪŋ/
/əʊ/ as in 'donˈt'	/dəʊnt/	/h/ as in 'help'	/help/
/eə/ as in 'where'	/weər/	/l/ as in 'listen'	/ˈlɪs·ən/
/aʊ/ as in 'how'	/haʊ/	/r/ as in 'American'	/əˈmer·ɪ·kən/
/eɪ/ as in 'native'	/ˈneɪ.tɪv/	/w/ as in 'which'	/wɪʧ/
		/j/ as in 'yes'	/jes/

2.2.2 The Organs of Speech

The term refers to all those parts of the human body which are concerned in various ways with the production of speech. Most of them are only secondarily concerned with speech production since their primary functions are to do with eating, chewing and swallowing food, and respiration.

Speech is produced in the throat, mouth and nasal passage, but there are no "speech organs" as such, strictly speaking; all of the organs used in speech have other, and perhaps, more fundamental purpose involving eating and breathing. Nevertheless, the term is familiar and meaningful in the context of articulatory phonetics, and it will be used here. The speech organs are shown in Figure 3, a cross-section of the head and throat.

Figure 3. The Organs of Speech (adopted from Roach 2000, p. 8)



The lungs, diaphragm, chest muscles and windpipe also act in the production of speech, but they will not be discussed in detail as their function is more or less automatic.

According to Avery (1992) investigated speech production is caused by a column of enclosed air to vibrate. It is the same process, basically, as the production of sound by a wind instrument in music. Air is forced under pressure from the lungs trough the windpipe (*trachea)*, to the voice box (*larynx),* a structure that sits on top of the windpipe and contains the vocal cords, as they are called. (These are not cords at all, really, and would be more properly named bands or membranes).

The vocal cords have the capability of closing off entirely the opening *(glottis)* and can hold considerable air pressure (as when a person coughs or strains to lift a heave weight). They can also assume other positions. They may be wide open, allowing the air to pass unimpeded. Or they may be closed almost but not quite completely, so that the scraping air, forced through the narrow opening between them causes them to vibrate like the reed in a musical instrument. This vibration makes the all-important vocal tone. Known technically as *voice*, without which speech would be impossible. Speech sounds that have this tone as part of their makeup are called *voiced,* and those without it are called unvoiced or *voiceless.* Varying the amount of tension on the vocal cords causes the vocal tone to vary in quality and in number of cycles per second; in other words, the *timbre* and *pitch* of the tone can be changed voluntarily, within limits by the speakers.

The air stream issuing from the larynx with or without voice can now be modified in many ways; that is, we are at the stage of articulation. Almost all the parts of the throat and lower head that are accessible to the air stream can take part in articulation. For discussion purposes, are

divided these parts into four groups; *resonating cavities, articulators, place of articulation* and *manner of articulation.*

2.2.2.1 Resonating Cavities

The size, the shape, and the material composition of the vessel enclosing a vibrating air column all have important effects on the quality of the sound that comes from it. There are quite a few spaces in the speech tract that effect sounds by their resonating qualities; in accosting terms, they reinforce (amplify) certain frequencies and suppress or weaken (dampen) others. In addition to the sinuses and other spaces in the head, which function passively and without the control of the speaker, the resonating cavities involved in speech production are these: the *pharynx*, the space formed by the root of the tongue and the walls of the throat, which affects the sound by its shape but is not actively used in English; the *nose*, which adds its quite distinctive quality to the sounds if the air is allowed to pass through it whether or not the mouth is involved at the same time; and finally, the *mouth*, the most important of all because it contains a number of highly mobile organs and can assume a tremendous number of different shapes.

2.2.2.2 Articulators

These are mobile organs that can be brought close to, or into contact within, various locations in the speech tract (known as *place or point of articulation*) so as to stop or impede the free passage of the air stream. The *manner of articulation* is determined by the kind of closure or near closure that is made, as well as its manner of release. The *articulators* are the lips, especially the lower one; the tongue, usually divided into four parts; tip, front or blade, middle or body, and back or root Avery (1992). Other articulators include the uvula (the small movable flap at the

back of the soft palate), and, the jaw, through its role is minor (it is possible to speak quite clearly with the jaws clenched, as ventriloquist do).

2.2.2.3 Place of Articulation

In the production of sounds, air passes through one or both of two passageways: the oral cavity (mouth) or the nasal passageway (nose), depending on whether the nasal passageway is blocked off or not (Celce-Murcia, 1996).

Important places or points of articulation in English are the upper lip, the teeth, and the roof of the mouth – beginning with the alveolar ridge and continuing back through the hard palate area to the velum. Figure 3 shows the sagittal section diagram of these organs of speech.

The places of articulation for consonants in English are divided in two groups: the active articulators and the passive. Active articulators are the ones that move: the tongue tip is an active articulator in sounds like [s t n], since it moves up to behind the teeth. Passive articulators are articulators that cannot move, but are the target for active articulators. In the case of sounds like [s t n], the passive articulator is the bony ridge behind the upper teeth, known as the alveolar (tooth) ridge (Ogden, 2009).

The places of articulation for consonants in English can be summarized as the following:

a) *Bilabial:* produced with the two lips: /b/, /p/, /m/, /w/ as in *buy*, *pie*, *my* and *wool*.

b) *Labiodental:* produced with the upper teeth and inner lower lip: /f/, /v/ as in *fee* and *veal*.

c) *Interdental/Dental:* produced with the tongue tip on or near the inner surface of the upper teeth: /θ/, /ð/ as in *thick* and *then*.

d) *Alveolar:* produced with the tongue tip on or near the tooth ridge: /t/, /d/, /s/, /z/, /n/, /l/ as in *to, do, so, zoo, new,* and *light.*

e) *Alveopalatal/Palatal:* produced with the tongue blade or body near the hard palate: /ʃ/, /ʒ/, /tʃ/, /dʒ/, /r/ and /j/ as in *show, beige, chow, Jim, rake* and *you*.

f) *Velar:* produced with the tongue body on or near the soft palate: /g/, /k/, /ŋ/ as in *go, kite,* and *bang*.

g) *Glottal:* produced by air passing from the windpipe through the vocal cords: /h/ as in *hi*.

2.2.2.4 Manner of Articulation

The type of obstacle course that air takes referred to as the *manner of articulation*, is another distinguished feature of how consonants are produced (Celce-Murcia, 1996). There are several basic ways that the airstream can be obstructed. For example: when the airstream is stopped or blocked completely prior to release is a *stop* manner of articulation and grouped in these consonants: /p/, /b/, /t/, /d/, /k/, /g/.

a) It is called *fricative* when the air is forced through a narrow passageway in the mouth or throat creating continuous friction: /f/, /v/, /θ/, /ð/, /s/, /z/, /ʃ/, /ʒ/, /h/.

b) *Affricative*: when the sound begins as a stop and is then released as a fricative: /tʃ/, /dʒ/.

c*) Nasal*: When the continuous air is released through the nasal cavity while the speech organs assume a stop like position: /m/, /n/, / ŋ /.

d) *Approximant*: When the airstream moves around the tongue in a relatively unobstructed manner: liquids /l/, /r/ and glides /w/, /y/.

Figure 4. Classification of NAE Consonant Phonemes (adopted from Avery 1992, p. 54)

Classification of NAE Consonant Phonemes							
Manner of Articulation	Place of Articulation						
	Bilabial	Labiodental	Dental	Alveolar	Palatal	Velar	Glottal
Stop Voiceless	p			t		k	
Voiced	b			d		g	
Fricative Voiceless		f	θ	s	ʃ		h
Voiced		v	ð	z	ʒ		
Affricate Voiceless					tʃ		
Voiced					dʒ		
Nasal Voiced	m			n		ŋ	
Liquid Voiced				l	r		
Glide Voiced	w				y		

As can be seen in Figure 4, all the consonant phonemes in English are represented in the two previous groups, place of articulation and manner of articulation.

2.2.3 The English vowel sounds

Children from their earliest elementary school days can name the vowels of the English alphabet: *a, e, i, o,* and *u.* Of course, defining vowel sounds and describing their phonetic properties is not as simple matter as naming the five orthographic vowels. In fact, it could be found at least fourteen distinct stressed vowel sounds rather than five; because the number of vowels and the transcription system could be varying because of the dialect of English described (Celce-Murcia, 1996).

As stated before, the position of the articulatory organs in the production of vowels is not as easily specified as that of consonants. In this case, vowels are classified as high, mid, or low referring, to the level of the tongue within the oral cavity and the accompanying raised or lowered position of the jaw.

As well, vowels are also classified as front, central, or back, depending on how far forward or back the tongue is positioned within the oral cavity during articulation and which part of the tongue is involved.

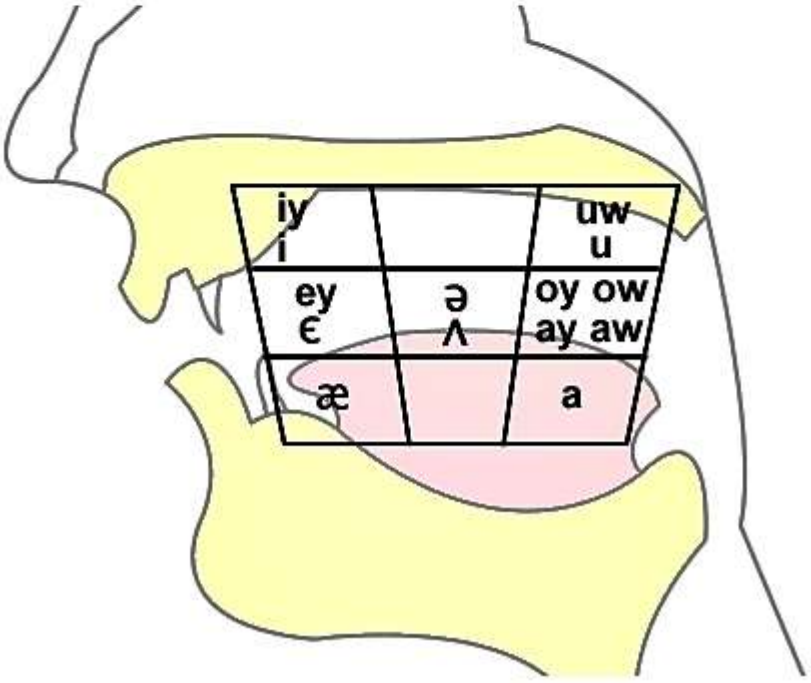
Besides, vowels can be either tense or lax. These terms refer to the amount of muscle tension used to produce the vowel, the tendency of the vowel to glide, its distribution in closed or open syllables, and its relative place of articulation.

Furthermore, vowels are simple or glide. The latter term refers to vowels with tongue movement occasioned by an accompanying /y/ or /w/ glide. Of these glided vowels, those with an adjacent glide are distinguished from the three phonemic diphthongs, which involve a nonadjacent glide.

Finally, vowels are characterized by the degree of lip rounding or spreading that occurs during their articulation as shown in Figure 5.

Figure 5. Classification of English vowel sounds (adapted from Avery 1992, p. 78)

		front *(unrounded)*	central *(unrounded)*	back *(rounded)*
high	*tense*	iy (beat)		uw (boot)
	lax	i (bit)		ʊ (book)
mid	*tense*	ey (bait)	ə (machine)	oy (boy) ow (boat)
	lax	ɛ (bet)	ʌ (but)	ay (time) aw (wow)
low		æ (bat)	a (pot)	



2.2.4 English pronunciation pattern

The terms ‘stress’ and ‘accent’ can be used to refer to the same thing in English: syllables that are more prominent than their neighbors (Hammond, 1999).

When a word has more than one stress, typically one stress is stronger than others. This is termed the ‘primary stress’ and the others ‘secondary stresses. Primary stress is traditionally marked with an accent, (ˈ), for example, [əˈraʊnd], and secondary stress with a low mark, (ˌ), for example, [ˌfəʊ.təˈgræf.ɪk].

There is also a traditional vocabulary for describing what syllable of the word stress falls on: the ‘ultima’ refers to the last syllable of the word. The ‘penult’ is the second syllable from the right. The ‘antepenult’ is the third syllable from the right, and the ‘preantepenult’ is the fourth syllable from the right.

Many writers have said that English word stress is so difficult to predict that it is best to treat stress placement as a property of the individual word, to be learned when the word itself is learned (Roach,2000). In order to decide on stress placement, it is necessary to make use of some or all of the following information:

a) Whether the word is morphologically simple, or whether it is complex as a result either of containing one or more affixes (that is, prefixes or suffixes) or of being a compound word.

b) What is the grammatical category of the word is (noun, verb, adjective, etc.)

c) How many syllables the word has.

e) What the phonological structure of those syllables is.

2.3 Sounds of Spanish

Individual languages, of course, vary in the specific sound they use, but the number of contrastive sounds in a language is always small, if we consider the number of words, the size of the vocabulary, that is constructed by putting together these consonants and vowels in different combinations. In Spanish there only five vowel phonemes and fewer that twenty consonant phonemes, the exact number depends on the dialect. English has a slightly larger consonantal inventory (twenty-four or so) and more than twice as many vowel phonemes in Spanish (Hualde, 2005).

Languages, such as English and Spanish have a standard form. In the case of English, there is some small amount of national variation in the recognized standard. As it is well known, the American standard differs from the British in a few details of spelling (*center or centre, color or colour,* etc.); differences in pronunciation are somewhat greater among national or regional standards of English. In Spanish, the Real Academia Española, which has affiliated academies in all Spanish-speaking countries, is in charge of the mission to ensure the standardization of the language.

In all languages there is variation among speakers in some of the words they use, the grammatical constructions that they employ and, most importantly for this paper, in their pronunciation. From the way people speak we can often tell where they come from. The distinct ways of speaking a language in the regions and countries where it is spoken natively are known as the geographical varieties or dialects of the language. Thus, in the case of Spanish the research is focus on Mexican dialect or Spanish of Mexico Hualde (2005, p18).

2.3.1 Spanish consonant sounds

In the production of consonant sounds, an articulatory organ, known as the active articulator (e.g. the lower tip, the tip of the tongue, the body of the tongue), is displaced to make contact or form a constriction with another articulatory organ, the passive articulator (e.g. the upper lip, the upper front teeth, the alveolar area, the hard palate, the velum), Hualde (2005, p41). The main articulators used in the production of the speech sounds of the Spanish language and also of English are identified in Fig. 3.

For the classification and description of consonants two parameters are employed: *manner of articulation* and *place of articulation.*

2.3.1.1 Manner of Articulation

This feature refers to the type of obstruction that is created in the articulation of the consonant in Spanish:

a) *Plosives (oral stops).* These are consonants in whose articulation the flow of air is completely stopped before it is released.

b) *Fricatives.* In the production of these consonants the flow of air is not completely interrupted.

c) *Approximants.* If the constriction made by the articulators is not narrow enough to produce friction, the approximant consonants refer to the fact that the active articulator merely approximates or approaches the passive articulator.

d) *Affricatives.* These are consonants whose articulation includes two phases: occlusion and fricative release.

e) *Nasals (nasal stops).* These consonants, like plosives, are produced with complete occlusion through the oral channel, but they allow the flow of air to escape through the nasal cavity.

f) *Laterals.* These are consonants produced with contact between the articulators along the central axis of the mouth, allowing airflow through one or both sides.

g) *Rhotics.* These are 'r-sounds'. In Spanish there are two rhotic phonemes, a trill and a tap. In Spanish these consonants are called *vibrantes.* The tap (*vibrante simple*) is produced with a single rapid contact of the tip of the tongue against the alveolar region. The trill (*vibrante múltiple*) is produced with two or more such rapid gestures.

2.3.1.2 Place of Articulation

The feature of place is used to classify consonant sounds with respect to the articulators that are involved in their production:

a) *Bilabial.* The plosive consonant [p] is produced by making contact with both lips. Nasals take a bilabial place of articulation before bilabial consonants, as shown in the example *un vaso* /ún báso/.

b) *Labiodental.* In the production of the fricative consonant [f] the active articulator is again the lower lip, which moves to make contact with the upper tooth range. English and most other European languages have another labiodentals fricative, [v] which functions as a distinct

phoneme. In Spanish, on the other hand, the voiced sound [v] only occurs as an allophone of the phoneme /f/ before a voiced consonant.

c) *Interdental.* In interdental consonants the tip of the tongue or apex is protruded between the upper and lower teeth. Northern-Central Peninsular Spanish has an interdental fricative [θ], which functions as a distinctive phoneme in this dialect.

d) *Dental.* In dental consonants the passive articulator is the base of the upper front teeth. In the Spanish dental plosives [t] and [d] (which have more fronted articulation than the corresponding English sounds), the active articulator is the apex.

e) *Alveolar.* In alveolar consonants the passive articulator is the alveolar ridge, the raised are where the roots of the upper front teeth are inserted. Spanish [n], [l], [ɾ] and [r] are normally articulated as apico-alveolar consonants; that is, which contact involving the apex and the alveolar ridge.

f) *Prepalatal (or postalveolar).* The fricatives [ʃ], [ʒ], and [tʃ], are articulated with a construction formed between the front part of the dorsum and an extensive area of the front of the mouth between the alveolar ridge and the hard palate. This pronunciation is commonly found in, Spain and Argentina.

g) *Palatal.* The most common pronunciation in Spanish of the phoneme [ʝ], spelt y, ll, involves the raising of the dorsum towards the hard palate (the roof of the mouth).

h) *Velar.* The plosives [k] and [g] are articulated with the back part of the dorsum making contact against the back of the mouth (the velum). The most common pronunciation of the

phoneme [x] is a velar fricative. This pronunciation is commonly found in Mexico, Peru and Argentina.

i) *Glottal (laryngeal).* The obstruction in the production of a consonant can also take place in the glottis. English has a glottal stop as in common pronunciation of /t/. Spanish does not have a glottal stop, but a glottal or laryngeal fricative [h], that is commonly found instead of [x] in Central America, the Caribbean, Colombia and parts of southern Spain.

Figure 6. Consonants of Spanish (adopted from Hualde 2005, p. 52)

Manner of articulation		Place of articulation							
		bilabial	labiodental	interdental	dental	alveolar	prepalatal	palatal	velar
plosive	v'less	p			t				k
	voiced	b			d				g
fricative	v'less		f	(θ)		s			x
	voiced						(ʒ)	(j)	
affricate	v'less						t͡ʃ		
nasal		m				n		ɲ	
lateral						l		(ʎ)	
rhotic	tap					ɾ			
	trill					r̄			

Notes: /θ/ only in Peninsular Spanish
/ʎ/ only in some Peninsular and South American varieties
/ʒ/ only in Argentinian Spanish
/j/ of questionable status as a phoneme

As can be seen in Figure 6, the consonant phonemes of Spanish are represented in the two previous groups, *place of articulation* and *manner of articulation*.

2.3.2 Spanish vowel sounds

Spanish has a simple, symmetrical, five-vowel system. These vowels can be arranged in the shape of a triangle, as in Figure 7. In the high dimension there are two high vowels /i/ and /u/, two mid vowels /e/ and /o/, and one low vowel /a/.

Five is the most common number of vowel phonemes cross-linguistically and, among these, symmetrical systems, as in Spanish, are in the majority (Disner, 1984).

Figure 7. The vowel phonemes of Spanish (Hualde 2005, p. 54)

	Front	Central	Back
High	i		u
Mid	e		o
Low		a	
	Nonround		Round

Consonants and vowels are phonologically grouped in units called syllables. The concept of the syllable is an important one in the sound structure of Spanish, as many phonological processes in this language are best seen in the light of syllable structure (Harris, 1983).

Figure 8. Structure of the syllables (Hualde 2005, p. 70)

	Rhyme		
Onset	Nucleus	Coda	
t	ú		*tú*
b	ié	n	*bien*
b	uéi		*buey*

As is shown in Figure 8 the nucleus and coda together are said to constitute the syllable rhyme. The binary division of subsyllabic constituents is thus between onset (optional) and rhyme. The rhyme, in its turn, consists of an obligatory nucleus and an optional coda.

The nucleus in Spanish, in addition to a vowel, may contain a glide as a 'satellite' either before or after the nuclear vowel, as in *prueba, hay* or *veinte* that is; both single vowels and diphthongs in the nucleus.

The structure of the Spanish language makes universal agreement on both of these points considerably easier to achieve than in English. The only real difficulties are found in the syllabification of sequences of vocoids (vowels and glides) (Hualde, 2005).

The general rule is syllabification of the sequence as a diphthong. Two subcases can be distinguished:

a) Rising diphthongs, where the sequence rises in sonority or aperture, from a closer to a more open position (glide + vowel).

/ia/ as in *feria* /io/ as in *idioma*/ue/ as in *prueba*

/ie/ as in *pienso* /ua/ as in *cuando*/uo/ as in *cuota*

b) Falling diphtonghs, with the opposite configuration (vowel + glide).

/ai/ as in *vanilla* /oi/ as in *hoy* /eu/ as in *Europa*

/ei/ as in *veinte* /au/ as in *taurino*

2.3.3 Spanish and English vowel systems

The vowel systems of Spanish and American English (AE) differ both in the size of their respective inventory and the number of relevant cues necessary for the vowel sounds to be perceived. These differences between the vowel inventories indicate that native listeners of the two respective languages rely more heavily on those phonemic cues that are relevant to identify their native phonemes (Hualde 2005, p.52).

The vowel system in Spanish consists of five vowels, which is a small inventory compared to the eleven vowels of English /i/, /ɪ/, /e/, /ɛ/, /æ/, /ɑ/, /ʌ/, /o/, /ɔ/, /ʊ/, /u/. The vowels in Spanish /i/, /e/, /a/, /o/, /u/ do not have a direct counterpart in the English vowel system (Hualde, 2005); they are described as high front and back /i/, /u/, which is shorter than the English /i/, /u/. Also, the tongue is lower for English /i/ and /u/ than for the same vowels in Spanish (Flege, 1995). Mid front and back Spanish vowels /e/, /o/, are pure monophthongs. Spanish has one low central vowel /a/, which is closer to the American English /ɑ/ than American English /æ/.

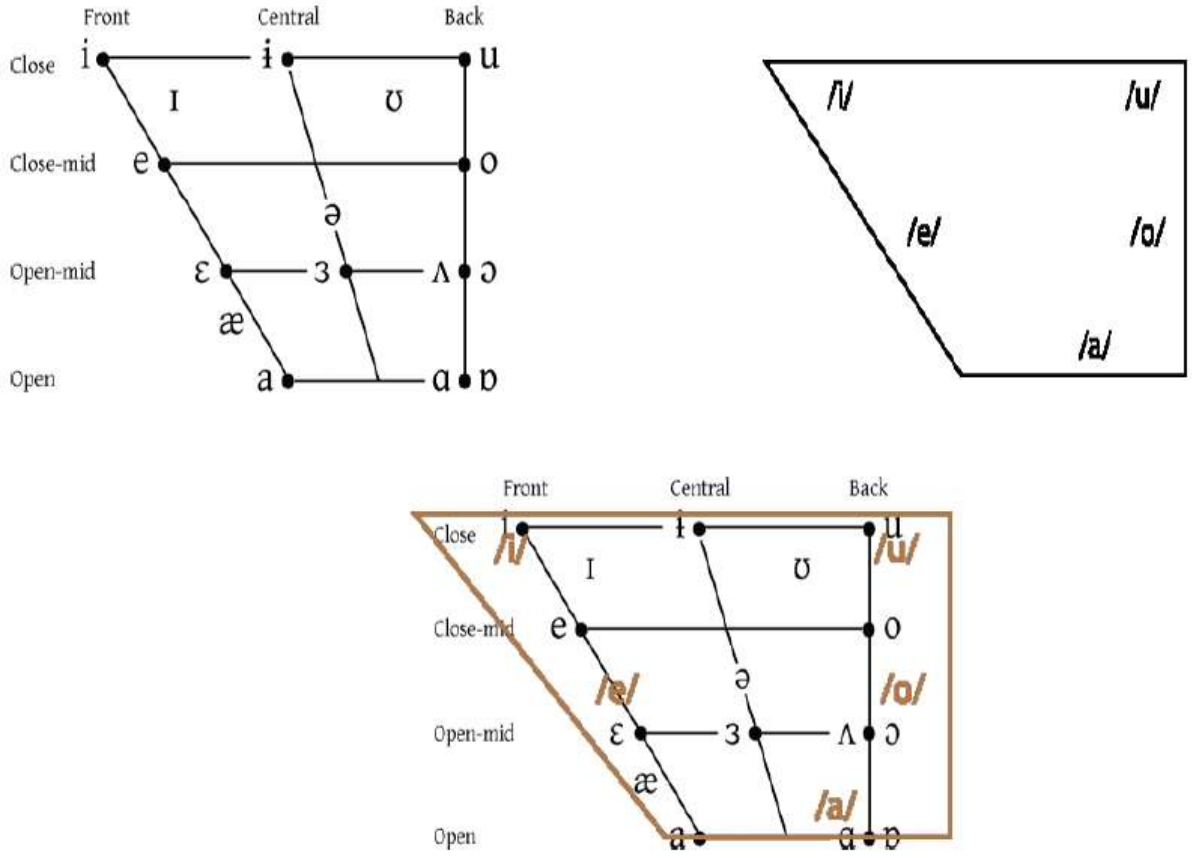
Significantly, the position of the tongue is also lower for English /ɑ/ than for Spanish /a/. In general, Spanish vowels are not called tense or lax, but they can be rounded /o/, /u/, and un-rounded /i/, /e/, /a/. Moreover, they only differ in spectral features, do not have as much formant movement as English vowels and may not be distinguished from one another by vowel duration differences (Harris, 1983). English vowels have been classified as tense or lax, a relative property that is determined in part by tongue root position. Tense vowels include /i/, /e/, /ɑ/, /o/, /ɔ/, /u/ while lax vowels are /ɪ/, /ɛ/, /æ/, /ʌ/, /ʊ/.

In order to perceive their native vowels, English speakers use two spectral dimensions: high-low (F1 formant), and front-back (F2 formant), derived from spectral cues and durational information. On the other hand, Spanish speakers use only the two dimensions of the spectral

cues (high-low and front-back) for distinguishing their native vowel contrasts (Fox, 1995 cited in Hualde, 2005). Some authors have suggested that tense/lax vowel contrasts are distinguished by spectral and durational cues combined.

According to (Bradlow, 1995) a comparative of an acoustic analysis was conducted to determine the location of the English and Spanish vowels in the vowel space, and whether their location was related to language-specific features. One of the interesting findings was that the points of articulation of the 'common' vowels in English and Spanish /i/, /e/, /o/, /u/ were different. This difference was particularly evident in the F2 dimension, which varies relatively to the position of the tongue in the oral cavity (back or front) to produce the vowel.

Figure 9. English and Spanish Vowels Quadrilateral (adapted from Hualde 2005, p.53)



The quadrilaterals represent in Figure 9 show the arrangement of the vowels in the vowel space. Left quadrilateral represents the arrangement of the American English vowels in the vowel space. Right quadrilateral represents the Spanish vowels in the vowel space. Below, the Spanish vowel space superimposed on the American English vowels.

2.4 Phonological Acquisition in a First Language

Even since the first results from the empirical researches into second language acquisition started coming into some years ago, it has been become more and more evident the generally accepted beliefs about the role of the mother tongue. Studies of child second language acquisition and the research into phonetics say that pre-linguistic babies are highly adept at discriminating among speech sounds and at many other perceptual tasks relevant to phonological learning (Kuhl, 1987).

2.4.1 Speech Perception

Ina study (Kuhl, 1987) investigates about the infant speech perception and says that speech and language are among the most amazing abilities within humans. Although infants may not speak for the first six months of their lives, they have actually been learning their native language since before they were even born! Even one day after birth, infants show biases towards hearing their mothers' voice and language and listening to stories and songs heard prenatally.

Speech perception is defined as the process by which humans listen to, interpret, and understand sounds used in language. Infants begin this process by detecting small differences in very basic speech sounds, or phonemes. They continue to learn language at an amazing rate due to their memory capacity, auditory skills, and ability to perceive language.

Some researchers maintain the idea that infants learn through passive listening while others believe that certain sound categories are innate. Furthermore, research shows that infants between four and six months of age can discriminate phonetic differences in both their native and non-native languages (Moyer, 2004).

2.4.2 Comparison to Second Language Acquisition

Although many of the speech-related tasks that babies must initially face are specific to first language (L1) learning only, others are clearly (or at least arguably) relevant to second acquisition (L2) as well. Segmenting the speech stream is certainly a task that second-language learners must also conquer, but with, perhaps, more comprehensive baggage, namely, depending on the age of acquisition of the L2, significant interference from L1 phonology.

2.5 Second Language Phonology

The field of second language (hereafter, L2) phonology dates back at least to 1953 who addressed, in part, how L2 sounds are constrained within a first language-based phonology (Weinreich, 1979). Despite these 50 years of thinking about L2 sound patterns and substantial research that identifies characteristics of these patterns, there is, to date, no singular model of the L2 sound system that has been widely patterned.

Second language (L2) phonology is different from first language (L1) phonology in various ways. The differences are considered to come from general characteristics of L2, such as slower speech rate and lower proficiency than native speakers, and also from the interaction between non-native speakers' L1 and L2 (Derwing & Munro, 1997).

2.5.1 Factors that influence Phonological Acquisition in a Second Language

The research in the acquisition of L2 phonology focuses on the social factors on L2 phonology and variation in production in L2 phonology. The discussion of social factors focuses on gender, extender of L1 and L2 use, social identity, and target language variety while the

discussion of variation focuses on interlocutor/speech accommodation, attention to speech/monitoring, and the effects of linguists and social factors on production.

The study on social factors and variation is unified in the underlying theoretical framework that learners are active agents in their language use, language choices, and targets for acquisition. That is, they are not passive of the target language, and variation in production is typically systematic and may be due, in part, to social marking due to gender, identity, accommodation, to the interacting, and the linguistic environment, etc. As a result, differences between the target language and the language of the learner may not necessarily be errors, but may be evidence of users targeting a particular variety that is not necessarily the standard or making their identity by using a certain variant in a specific situation with particular interacting. In other words, as (Levis, 2012) states, performance in the L2 may be specially conditioned.

Adults' acquisition of foreign language pronunciation is marked by a rarity of native-like control. The most common explanation for this is age and the influence of a critical period for language learning in general and for pronunciation in particular (Levis, 2012). While there is little argument about the correlation between age and the ultimate level of pronunciation mastery, there are more disputes about whether age is the cause of incomplete acquisition, with some researchers say a critical period for phonological acquisition may not exists (Flege, 1995).

Indeed, the amount of variation in pronunciation attainment among adult learners, from largely unintelligible to native-like, suggests that age cannot be the only influence on attainment.

Instead, other causes such as exposure to the target language and social influences may be central to ultimate attainment. The wide variation in attainment means the need to better understand the causes of varied pronunciation attainment.

Sociolinguistic research in SLA has documented that social, cultural and psychological factors affect language acquisition. Indeed, there is a growing chorus of scholars interested in how social factors influence the learner's approach to pronunciation, and ultimately, their likelihood of fossilizing (Moyer, 2004). Pronunciation attainment as seen in the sociolinguistic paradigm has shown that greater attention needs to be paid to individual differences in phonological attainment, especially in relation to factors such as identity and sense of self in the new language. Some questions that have been explored in relation to social issues include the relationship of learners' own views of their accents and their success in pronunciation attainment, the practical implications of accent and the social impact of accentedness, and how listener perceptions and attitudes toward pronunciation affect learners' social interactions.

2.5.2 Social and Linguistic Factors& Exposure to the Target Language

Although the dominant perspective in second-language research is a cognitive one, from the early days of the discipline researchers have also acknowledged that social aspects play an important role. There have been many different approaches to sociolinguistic study of second-language acquisition (SLA), and indeed, according to (Ellis, 1994) this plurality has meant that sociolinguistic SLA is replete with a bewildering set of terms referring to the social aspects of L2 acquisition. Common to each of these approaches, however, is a rejection of language as a purely psychological phenomenon; instead, sociolinguistic research views the social context in which language is learned as essential for a proper understanding of the acquisition process.

(Ellis, 1994) identifies three types of social structure which can affect the acquisition of second languages: sociolinguistic setting, specific social factors, and situational factors.

Sociolinguistic setting refers to the role of the second language in society, such as whether it is spoken by a majority or a minority of the population, whether its use is widespread or

restricted to a few functional roles, or whether the society is predominantly bilingual or monolingual. (Ellis, 1994) also includes the distinction of whether the second language is learned in a natural or an educational setting. Specific social factors that can affect second-language acquisition include age, gender, social class, and ethnic identity, with ethnic identity being the one that has received most research attention. Situational factors are those which vary between each social interaction. For example, a learner may use politer language when talking to someone of higher social status, but more informal language when talking with friends.

There have been several models developed to explain social effects on language acquisition. Schumann's acculturation model (Ellis, 1994) proposes that learners' rate of development and ultimate level of language achievement is a function of the "social distance" and the "psychological distance" between learners and the second-language community. In Schumann's model the social factors are most important, but the degree to which learners are comfortable with learning the second language also plays a role. Another sociolinguistic model is Gardner's socio-educational model (Ellis, 1994) which was designed to explain classroom language acquisition.

2.6 Conclusion

This chapter showed an overview of the differences between English and Spanish sound systems, which they were discussed in order to show a review of each language system and its features and the way sounds are produced in each language. In the same way, a comparison between phonological acquisition in first language and foreign language was explained in order to carry out research in the area of phonetics and phonology as it will be explained in the following chapter.

CHAPTER III: METHODOLOGY

The purpose of this chapter is to present the methodology used to undertake this project. It is divided in two sections. In the first section, the piloting project is described and the reasons why it was not followed. In the second section, the context where research took place and the characteristics of participants are explained. Also, the instruments discussed the way in which they were used in the study in order to compare the English sounds produced by participants and to see if there is a relation between those sounds with the answers given by participants in a questionnaire.

3.1 Piloting

Regarding the procedure to obtain the most appropriate instruments for the investigation, one pilot study was implemented. It helped to identify the problems that could affect the quality and reliability of the results. Thus, some aspects of the actual instruments had to be changed before its application. The pilot study was applied on November 2014 to four students who were not the actual participants of this project. That pilot instrument was a questionnaire adapted from (Tumuyu, 2010). The instrument was adapted to twelve questions with three options each instead of thirty questions in the original questionnaire version in order to achieve the needs by the project in that moment, which one of the main needs was knowing if participants had contact with native speakers.

However, the results showed some inconsistencies because it was adapted instead of created by me, in that way, the goal was not achieved. Also, some questions were not important for the research and some others did not help to answer my research questions. Furthermore, there were

aspects missing in the research that needed to be added in order to obtain the required information and that instrument did not comply to this purpose. For that reason, it was decided to create a new instrument in order to comprise more aspects than the pilot instrument and it was less time-consuming. A word list and a questionnaire were created in order to answer the research questions with concrete information instead of the pilot questionnaire that tried to answer the research questions with biased information. In addition, through the reviewing of this piloting it was noted that some aspects like the number of questions or words could be modified to obtain relevant information to the version of the project.

3.2 Context

The current study took place at the Facultad de Lenguas of the Benemérita Universidad Autónoma de Puebla. The school is located in Puebla City. The Facultad de Lenguas is one of the most important educational institutions in the area of teaching of languages at the local, state, national, and even international levels. The school offers two majors and a master, English as a Foreign Language Teaching (ELT), French as a Foreign Language Teaching (FLT), and English as a Foreign Language Teaching, respectively. Both majors and the master's program are taught by native and non-native speakers. The majority of students are non-native speakers of English and French, respectively, and their mother tongue is Spanish. The ELT's academic program called 'Minerva' is divided into 44 subjects during the 4 year of career, approximately. One of these elemental and relevant subjects is *Phonetics and Phonology* which is taught in second semester or summer courses. The current study was focused on Phonetics and Phonology because is an interesting linguistics area that not all the students know in depth and provides the tools that can help to improve our pronunciation.

3.3 Participants

The ELT major receives four hundred students every year that are divided into twelve groups of thirty students each, approximately. The research of this thesis was carried out in one of the twelve groups of third semester. In particular, the group three was chosen in summer courses because that group was the only with ten students or more. In order to apply the instruments, ten participants were chosen randomly, they are five men and five women, these participants were taken from the Lengua Meta III class, taught during the summer courses by the same teacher. On the other hand, the audio recordings of a native American English (NAE) speaker were taken from the online dictionary (Cambridge, 2016) in order to compare the sounds produced from the non-native speakers to the native speaker. NAE's recordings are shown in Chapter IV.

3.4 Instruments

The instruments needed to answer the research questions were the following: a word list and a questionnaire.

First, a word list was created as a first instrument with eight English-Spanish cognate words taken from the online dictionary (Cambridge, 2016). The cognate words were looked up in order to see if participants are familiar with the English version of the words when pronouncing them or if they follow the same patterns as the Spanish version. In addition, the level of words on the Common European Framework Reference for Languages (CEFR) was from A1 to B1. These words were the following: *native, crisis, future, guardian, pyramid, financial, biography,* and *pronunciation.* The eight cognate words were listed in numerical order of syllables, from less to more, and not alphabetically. The word list was printed and given to participants as word cards in

order to facilitate the material to make participants read aloud the words. Word cards are found in Appendix A.

Secondly, the questionnaire was created as a second instrument with eight multiple choice questions with five options each divided into two Likert scales; the first Likert scale of time from question 1 to 2, question *1* from *0* to *10* years and question *2* from *0* to *25* hours per week. The second Likert scale of frequency from question *3* to *8 contained* (*very often, often, sometimes, seldom* and *never)* each. The questionnaire was designed with the purpose to learn about their frequency of exposure to English language to further analyze if it affects their production of the English-Spanish cognate words. Full questionnaire is found in Appendix B.

3.5 Data collection

Firstly, to collect the data for this research it was necessary to create word cards and a questionnaire as mentioned before. The collected information by word cards (see Appendix A) with the eight English-Spanish cognate words was saved as audio recordings when participants read them out aloud in order to compare them to the NAE speaker's sounds taken from the online dictionary (Cambridge, 2016). The data by the questionnaire (see Appendix B) was collected in order to know their answers and to know if frequency or exposure to the English language influences their articulation of the English-Spanish cognate words.

3.6 Conclusion

This chapter showed an overview of the methodology used to undertake the project. The pilot project was described with the reasons because was not followed. With respect to the context was described in order to know where the study took place, and this chapter described the participants' characteristics in order to have more precise information. Also, the instruments section described the way in which instruments were designed and used in the study in order to compare the English sounds produced by participants and to see if there is a relation between those sounds with the answers given by participants in the questionnaire. The analyzed information is illustrated in tables and graphs and it is shown in Chapter IV.

CHAPTER IV: FINDINGS

In this chapter, the analysis of the data is developed and the results are discussed below. The chapter is divided into three parts: the results related to the word list (see Appendix A) to answer the first research question; how many English-Spanish cognate words do participants pronounce following mother tongue pronunciation patterns? The results that relate to pronounced sounds by participants when read aloud the word list to answer the second research question; which English sounds are mispronounced? Finally, the results given by their answers in questionnaire (see Appendix B) to answer the third research question; does exposure to English language influence participants' articulation?

4.1 Native speaker's pronunciation

In order to compare the eight English-Spanish cognate words produced by the non-native speakers when they read them out aloud, a native American English speaker's voice and phonetic transcription was taken from the online dictionary (Cambridge, 2016) as shown in Figure 10.

Figure 10. NAE's voice and phonetic transcription taken from Cambridge dictionary.

Therefore, each word produced by the native speaker and its phonetic transcription was collocated in the below table in order to measure the English pronunciation by non-native speakers as shown in 4.2

English words	**English pronunciation by native American Speaker's voice taken from the online dictionary (Cambridge, 2016)**
Native	/ˈneɪ.tɪv/
Crisis	/ˈkraɪ.sɪs/
Future	/ˈfju·ʧər/
Guardian	/ˈgɑr.di.ən/
Pyramid	/ˈpɪr.əˌmɪd/
Financial	/faɪˈnæn.ʃəl/
Biography	/baɪˈɑ.grə.fi/
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/

4.2 Non-native speakers' pronunciation of English-Spanish cognate words

With respect to the analysis of the English-Spanish cognate words produced by the native and non-native speakers, the sounds were uploaded to a sound platform (SoundCloud, 2016) in order to back up the recordings, after that, an audio software (Atomix, 2016) was used in order to compare accurate information when sounds were listened (see Appendix C). Therefore, the recordings produced by participants were transcribed into phonetic symbols with the help of the International Phonetic Alphabet (IPA) in order to translate the articulations to English and to answer the first research question as shown below.

1. How many English-Spanish cognate words do participants pronounce following mother tongue pronunciation patterns?

To answer the first research question, the data of the word list applied to students was listened and transcribed into phonetic symbols in order to compare their pronunciation to the native speaker's pronunciation as shown in each table below.

4.2.1 Word-by-word analysis

NATIVE						
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**		**Consonant(s)**	
			1st syllable	**2nd syllable**	**1st syllable**	**2nd syllable**
Native speaker	/ˈneɪ.tɪv/	1st syllable	/eɪ/	/ɪ/	/n/	/t/, /v/
Participant 1	/ˈneɪ.tɪv/	1st syllable	/eɪ/	/ɪ/	/n/	/t/, /v/
Participant 2	/ˈna.ti:v/	1st syllable	/a/	/i:/	/n/	/t/, /v/
Participant 3	/na.ˈti:b/	2nd syllable	/a/	/i:/	/n/	/t/, /b/
Participant 4	/na.ˈti:b/	2nd syllable	/a/	/i:/	/n/	/t/, /b/
Participant 5	/ˈneɪ.tɪv/	1st syllable	/eɪ/	/ɪ/	/n/	/t/, /v/
Participant 6	/ˈna.ti:b/	1st syllable	/a/	/i:/	/n/	/t/, /b/
Participant 7	/na.ˈti:b/	2nd syllable	/a/	/i:/	/n/	/t/, /b/
Participant 8	/na.ˈti:b/	2nd syllable	/a/	/i:/	/n/	/t/, /b/
Participant 9	/ˈneɪ.tɪv/	1st syllable	/eɪ/	/ɪ/	/n/	/t/, /v/
Participant 10	/ˈneɪ.tɪv/	1st syllable	/eɪ/	/ɪ/	/n/	/t/, /v/

As it can be seen in the above table, the first cognate word *native* was articulated by the native speaker as /ˈneɪ.tɪv/. Participant 1 articulated as /ˈneɪ.tɪv/. Participant 2 articulated as /ˈna.ti:v/.Participant 3 articulated as /na.ˈti:b/. Participant 4 articulated as /na.ˈti:b/. Participant 5 articulated as /ˈneɪ.tɪv/. Participant 6 articulated as /ˈna.ti:b/. Participant 7 articulated as /na.ˈti:b/. Participant 8 articulated as /na.ˈti:b/. Participant 9 articulated as /ˈneɪ.tɪv/. Finally, participant 10 articulated as /ˈneɪ.tɪv/. It is shown that participants 1, 5, 9 and 10 pronounced correctly the word because they articulated the word *native* as the native speaker. On the contrary, participant 2

mispronounced the word because he pronounced the vowel sound /a/ in first syllable instead of the diphthong /eɪ/, and /i:/ in second syllable instead of /ɪ/, and participants 3, 4, 7, and 8 mispronounced the word because they stressed the syllable in the second syllable instead of the first syllable, and they pronounced the vowel sound /a/ in first syllable instead of the diphthong /eɪ/, and /i:/ in second syllable instead of the vowel sound /ɪ/. In addition, they pronounced the consonant sound /b/ instead of the consonant sound /v/. Participant 6 mispronounced the word because he pronounced the vowel sound /a/ in first syllable instead of the diphthong sound /eɪ/, and /i:/ in second syllable instead of the vowel sound /ɪ/, and he pronounced the consonant sound /b/ instead of the consonant sound /v/.

CRISIS						
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**		**Consonant(s)**	
			1st syllable	**2nd syllable**	**1st syllable**	**2nd syllable**
Native speaker	/ˈkraɪ.sɪs/	1st syllable	/aɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 1	/ˈkraɪ.sɪs/	1st syllable	/aɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 2	/ˈkraɪ.sɪs/	1st syllable	/aɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 3	/ˈkrɪ.sɪs/	1st syllable	/ɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 4	/ˈkraɪ.si:s/	1st syllable	/aɪ/	/i:/	/k/, /r/	/s/, /s/
Participant 5	/ˈkrɪ.sɪs/	1st syllable	/ɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 6	/ˈkraɪ.sɪs/	1st syllable	/aɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 7	/ˈkraɪ.sɪs/	1st syllable	/aɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 8	/ˈkri:.sɪs/	1st syllable	/i:/	/ɪ/	/k/, /r/	/s/, /s/
Participant 9	/ˈkrɪ.sɪs/	1st syllable	/ɪ/	/ɪ/	/k/, /r/	/s/, /s/
Participant 10	/ˈkri:.sɪs/	1st syllable	/i:/	/ɪ/	/k/, /r/	/s/, /s/

As it is shown in the above table, the second cognate word *crisis* was articulated by the native speaker as /ˈkraɪ.sɪs/. Participant 1 articulated as /ˈkraɪ.sɪs/. Participant 2 articulated as /ˈkraɪ.sɪs/. Participant 3 articulated as /ˈkrɪ.sɪs/. Participant 4 articulated as /ˈkraɪ.si:s/. Participant 5 articulated as /ˈkrɪ.sɪs/. Participant 6 articulated as /ˈkraɪ.sɪs/. Participant 7 articulated as /ˈkraɪ.sɪs/. Participant 8 articulated as/ˈkri:.sɪs/. Participant 9 articulated as /ˈkrɪ.sɪs/. Finally, participant 10 articulated as /ˈkri:.sɪs/. It is shown that participants1, 2, 6 and 7 pronounced correctly the word because they articulated the word *crisis* as the native speaker. In contrast, participants 3, 5, and 9 mispronounced the word because they pronounced the vowel sound /ɪ/ instead of the diphthong sound /aɪ/ in first syllable. Also, participant 4 mispronounced the word because she pronounced the vowel sound /i:/ instead of the vowel sound /ɪ/ in second syllable. Finally, participants 8 and 10 mispronounced the word because they pronounced the vowel sound /i:/ instead of the diphthong sound /aɪ/ in first syllable.

FUTURE						
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**		**Consonant(s)**	
			1st syllable	**2nd syllable**	**1st syllable**	**2nd syllable**
Native speaker	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 1	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 2	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 3	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 4	/fju· tʃər/	None	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 5	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 6	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 7	/fju· tʃər/	None	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 8	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 9	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/
Participant 10	/ˈfju· tʃər/	1st syllable	/u/	/ə/	/f/, /j/	/tʃ/, /r/

As it can be seen in the above table, the third cognate word *future* was articulated by the native speaker as /ˈfju·ʧər/. Participant 1articulated as /ˈfju·ʧər/. Participant 2articulated as /ˈfju·ʧər/. Participant 3 articulated as /ˈfju·ʧər/. Participant 4articulated as /fju·ʧər/. Participant 5 articulated as /ˈfju·ʧər/. Participant 6articulated as /ˈfju·ʧər/. Participant 7articulated as /fju·ʧər/. Participant 8articulatedas /ˈfju·ʧər/. Participant 9articulated as /ˈfju·ʧər/. Finally, participant 10 articulated as /ˈfju·ʧər/. It is shown that participants 1, 2, 3, 5, 6, 8, 9 and 10 pronounced correctly the word because they articulated the word *future* as the native speaker. On the contrary, participants 4 and 7 mispronounced the word because they unstressed the first syllable as the native speaker.

GUARDIAN								
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**			**Consonant(s)**		
			1st syllable	**2nd syllable**	**3rd syllable**	**1st syllable**	**2nd syllable**	**3rd syllable**
Native speaker	/ˈgɑr.di.ən/	1st syllable	/ɑ/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 1	/ˈgɔr.di.ən/	1st syllable	/ɔ/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 2	/ˈgɔr.di.ən/	1st syllable	/ɔ/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 3	/ˈguar.di.ən/	1st syllable	/ua/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 4	/ˈguar.di.ən/	1st syllable	/ua/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 5	/ˈgar.gi.ən/	1st syllable	/ɑ/	/i/	/ə/	/g/, /r/	/g/	/n/
Participant 6	/ˈgɔr.di.ən/	1st syllable	/ɔ/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 7	/guar.ˈdi.ən/	2nd syllable	/ua/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 8	/ˈguar.di.ən/	1st syllable	/ua/	/i/	/ə/	/g/, /r/	/d/	/n/
Participant 9	/ˈgɑr.dən/	1st syllable	/ɑ/	None	/ə/	/g/, /r/	/d/	/n/
Participant 10	/guar.ˈdi.ən/	2nd syllable	/ua/	/i/	/ə/	/g/, /r/	/d/	/n/

As it is shown in the above table, the fourth cognate word *guardian* was articulated by the native speaker as /ˈgɑr.di.ən/. Participant 1 articulated as /ˈgɔr.di.ən/. Participant 2 articulated as

/ˈgɔr.di.ən/. Participant 3 articulated as /ˈguar.di.ən/. Participant 4 articulated as /ˈguar.di.ən/. Participant 5 articulated as /ˈgar.gi.ən/. Participant 6 articulated as /ˈgɔr.di.ən/. Participant 7 articulated as /guar.ˈdi.ən/. Participant 8 articulated as /ˈguar.di.ən/. Participant 9 articulated as /ˈgɑr.dən/. Finally, participant 10 articulated as /guar.ˈdi.ən/. It is shown that any participant pronounced correctly the word because all of them did not articulate the word as the native speaker. Participants 1, 2, and 6 mispronounced the word because they pronounced the vowel sound /ɔ/instead of the vowel sound /ɑ/ in first syllable. Participants 3, 4, and 8 mispronounced the word because they pronounced the diphthong sound /ua/ instead of the vowel sound /ɑ/. Participant 5 mispronounced the word because he pronounced the consonant sound /g/ instead of the consonant sound /d/ in second syllable. Participants 7 and 10 mispronounced the word because they stressed the second syllable instead of the first syllable and they pronounced the diphthong sound /ua/ instead of the vowel sound /ɑ/. Finally, participant 9 did not pronounced the /i/ sound in second syllable.

PYRAMID								
Participant	**Articulation**	**Syllable Stresses**		**Vowel(s)**			**Consonant(s)**	
		Primary Stress	**Secondary Stress**	**1st syllable**	**2nd syllable**	**3rd syllable**	**1st syllable**	**3rd syllable**
Native speaker	/ˈpɪr.əˌmɪd/	1st syll.	3rd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 1	/ˈpɪr.əˌmɪd/	1st syll.	3rd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 2	/ˈpaɪr.əˌmɪd/	1st syll.	3rd syll.	/aɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 3	/pɪrˌə.ˈmɪd/	3rd syll.	2nd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 4	/ˈpɪr.əˌmɪd/	1st syll.	3rd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 5	/ˈpaɪr.əˌmɪd/	1st syll.	3rd syll.	/aɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 6	/ˈpaɪr.ə.mɪd/	1st syll.	3rd syll.	/aɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 7	/ˈpɪr.əˌmɪd/	1st syll.	3rd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 8	/pɪr.əˌmɪd/	None	3rd syll.	/ɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/

Participant 9	/ˌpaɪr.əˈmɪd/	3rd syll.	1st syll.	/aɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/
Participant 10	/ˌpaɪr.əˈmɪd/	3rd syll.	1st syll.	/aɪ/	/ə/	/ɪ/	/p/, /r/	/m/, /d/

As it can be seen in the above table, the fifth cognate word *pyramid* was articulated by the native speaker as /ˈpɪr.əˌmɪd/. Participant 1 articulated as /ˈpɪr.əˌmɪd/. Participant 2 articulated as /ˈpaɪr.əˌmɪd/. Participant 3 articulated as /pɪrˌəˈmɪd/. Participant 4 articulated as /ˈpɪr.əˌmɪd/. Participant 5 articulated as /ˈpaɪr.əˌmɪd/. Participant 6 articulated as /ˈpaɪr.ə.mɪd/. Participant 7 articulated as /ˈpɪr.ə.mɪd/. Participant 8 articulated as /pɪr.əˌmɪd/. Participant 9 articulated as /ˌpaɪr.əˈmɪd/. Finally, participant 10 articulated as /ˌpaɪr.əˈmɪd/.It is shown that participants 1, 4, and 7 pronounced correctly the word because they articulated the word *pyramid* as the native speaker. In contrast, participants 2, 5, and 6 mispronounced the word because they pronounced the diphthong sound /aɪ/ instead of the vowel sound /ɪ/ in first syllable. Also, participant 3 mispronounced the word because he stressed the third syllable as primary stress and second syllable as secondary stress instead of first syllable and third syllable, respectively, and participant mispronounced the word because she unstressed the first syllable as primary stress as the native speaker. Finally, participants 9, and 10 mispronounced the word because they stressed the third syllable as primary stress and syllable as secondary stress instead of first syllable and third syllable, respectively, and they pronounced the diphthong sound /aɪ/ instead of the vowel sound /ɪ/.

FINANCIAL								
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**			**Consonant(s)**		
			1st syllable	**2nd syllable**	**3rd syllable**	**1st syllable**	**2nd syllable**	**3rd syllable**
Native speaker	/faɪˈnæn.ʃəl/	2nd syllable	/aɪ/	/æ/	/ə/	/f/	/n/, /n/	/ʃ/, /l/

Participant 1	/faɪˈnæn.ʃəl/	2nd syllable	/aɪ/	/æ/	/ə/	/f/	/n/, /n/	/ʃ/, /l/
Participant 2	/fɪˈnæn.sɪal/	2nd syllable	/ɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/s/, /l/
Participant 3	/fɪˈnæn.ʃəl/	2nd syllable	/ɪ/	/æ/	/ə/	/f/	/n/, /n/	/ʃ/, /l/
Participant 4	/faɪˈnæn.sɪal/	2nd syllable	/aɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/s/, /l/
Participant 5	/fɪˈnæn.ʃəl/	2nd syllable	/ɪ/	/æ/	/ə/	/f/	/n/, /n/	/ʃ/, /l/
Participant 6	/fɪˈnænsɪal/	2nd syllable	/ɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/s/, /l/
Participant 7	/fɪˈnæn.ʃəl/	2nd syllable	/ɪ/	/æ/	/ə/	/f/	/n/, /n/	/ʃ/, /l/
Participant 8	/fɪˈnænsɪal/	2nd syllable	/ɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/s/, /l/
Participant 9	/fɪˈnæn.sɪal/	2nd syllable	/ɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/s/, /l/
Participant 10	/fɪˈnænʃɪal/	2nd syllable	/ɪ/	/æ/	/ɪa/	/f/	/n/, /n/	/ʃ/, /l/

As it is shown in the above table, the sixth cognate word *financial* was articulated by the native speaker as /faɪˈnæn.ʃəl/. Participant 1 articulated as /faɪˈnæn.ʃəl/. Participant 2 articulated as /fɪˈnæn.sɪal/. Participant 3 articulated as /fɪˈnæn.ʃəl/. Participant 4 articulated as /faɪˈnæn.sɪal/. Participant 5 articulated as /fɪˈnæn.ʃəl/. Participant 6 articulated as /fɪˈnænsɪal/. Participant 7 articulated as /fɪˈnæn.ʃəl/. Participant 8 articulated as /fɪˈnænsɪal/. Participant 9 articulated as /fɪˈnæn.sɪal/. Finally, participant 10 articulated as / fɪˈnænʃɪal/. It is shown that participant 1 pronounced correctly the word because she pronounced the word *financial* as the native speaker. On the contrary, participants 2, 6, 8, and 9 mispronounced the word because they pronounced the vowel sound /ɪ/ instead of the diphthong sound /aɪ/ in first syllable, and they pronounced the diphthong sound /ɪa/ instead of the vowel sound /ə/ in third syllable, and they pronounced the consonant sound /s/ instead of the consonant sound /ʃ/ in third syllable. Participant 3 mispronounced the word because he pronounced the vowel sound /ɪ/ instead of the diphthong sound /aɪ/ in first syllable. Participant 4 mispronounced the word because he pronounced the diphthong sound /ɪa/ instead of the vowel sound /ə/ in third syllable, and he pronounced the

consonant sound /s/ instead of the consonant sound /ʃ/ in third syllable. Participants 5 and 7 mispronounced the word because they pronounced the vowel sound /ɪ/ instead of the diphthong sound /aɪ/ in first syllable. Finally, participant 10 mispronounced the word because he pronounced the vowel sound /ɪ/ instead of the diphthong sound /aɪ/ in first syllable, and he pronounced the diphthong sound /ɪa/ instead of the vowel sound /ə/ in third syllable.

BIOGRAPHY								
Participant	**Articulation**	**Syllable Stress**	**Vowel(s)**			**Consonant(s)**		
			1st syllable	**2nd syllable**	**3rd syllable**	**1st syllable**	**2nd syllable**	**3rd syllable**
Native speaker	/baɪˈɑ.grə.fi/	2nd syllable	/aɪɑ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 1	/baɪˈɑ.grə.fi/	2nd syllable	/aɪɑ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 2	/ˈbɪɔ.grə.fi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 3	/ˈbɪɔ.grə.pi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/p/
Participant 4	/bɪˈɔ.grə.pi/	2nd syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/p/
Participant 5	/ˈbɪɔ.grə.fi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 6	/ˈbɪɔ.grə.pi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/p/
Participant 7	/ˈbɪɔ.grə.fi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 8	/ˈbɪɔ.grə.fi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 9	/baɪˈɑ.grə.fi/	2nd syllable	/aɪɑ/	/ə/	/i/	/b/	/g/, /r/	/f/
Participant 10	/ˈbɪɔ.grə.pi/	1st syllable	/ɪɔ/	/ə/	/i/	/b/	/g/, /r/	/p/

As it can be seen in the above table, the seventh cognate word *biography* was articulated by the native speaker as /baɪˈɑ.grə.fi/. Participant 1 articulated as /baɪˈɑ.grə.fi/. Participant 2 articulated as /ˈbɪɔ.grə.fi/. Participant 3 articulated as /ˈbɪɔ.grə.pi/. Participant 4 articulated as /bɪˈɔ.grə.pi/. Participant 5 articulated as /ˈbɪɔ.grə.fi/. Participant 6 articulated as /ˈbɪɔ.grə.pi/. Participant 7 articulated as /ˈbɪɔ.grə.fi/. Participant 8 articulated as /ˈbɪɔ.grə.fi/. Participant 9 articulated as /baɪˈɑ.grə.fi/. Finally, participant 10 articulated as /ˈbɪɔ.grə.pi/. It is shown that

participants1 and 9 pronounced correctly the word because they pronounced the word *biography* as the native speaker. In contrast, participants 2, 5, 7, and 8 mispronounced the word because they stressed the first syllable instead of the second syllable, and they pronounced the diphthong sound /ɪɔ/ instead of the triphthong sound/aɪɑ/ in first syllable, and they pronounced the consonant sound /p/ instead of the consonant sound /f/ in third syllable. In addition, participant 4 mispronounced the word because she pronounced the diphthong sound /ɪɔ/ instead of the triphthong sound /aɪɑ/ in first syllable, and she pronounced the consonant sound /p/ instead of the consonant sound /f/ in third syllable. Finally, participants 3, 6, and 10 mispronounced the word because they stressed the first syllable instead of the second syllable, and they pronounced the diphthong sound /ɪɔ/ instead of the triphthong sound /aɪɑ/ in first syllable, and they pronounced the consonant sound /p/ instead of the consonant sound /f/ in third syllable.

PRONUNCIATION											
Participant	**Articulation**	**Syllable Stresses**		**Vowel(s)**				**Consonant(s)**			
		Primary Stress	**Sec. Stress**	**1st syll.**	**2nd syll.**	**3rd syll.**	**4th syll.**	**1st syll.**	**2nd syll.**	**3rd syll.**	**4th syll.**
Native speaker	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 1	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 2	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 3	/prəˌnʌnˑsˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/eɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 4	/prəˌnʌnˑsˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/eɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 5	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 6	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 7	/prəˌnʌnˑsˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/eɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 8	/prəˌnʌnˑsiˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/ieɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/

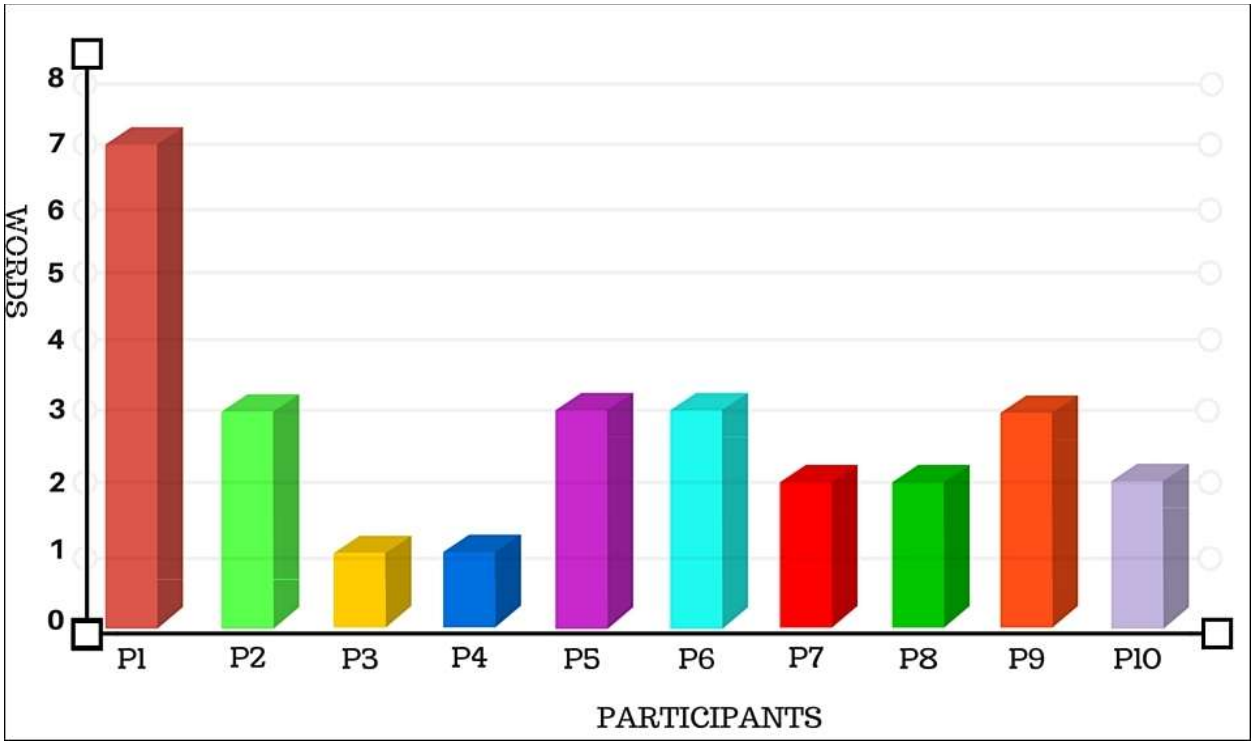
Participant 9	/prəˌnʌnˑsˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/eɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/
Participant 10	/prəˌnʌnˑsˈeɪˑʃən/	3rd syll.	2nd syll.	/ə/	/ʌ/	/eɪ/	/ə/	/p/, /r/	/n/, /n/	/s/	/ʃ/, /n/

As it is shown in the above table, the eighth cognate word *pronunciation* was articulated by the native speaker as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 1 articulated as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 2 articulated as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 3 articulated as /prəˌnʌnˑsˈeɪˑʃən/. Participant 4 articulated as /prəˌnʌnˑsˈeɪˑʃən/. Participant 5 articulated as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 6 articulated as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 7 articulated as /prəˌnʌnˑsˈeɪˑʃən/. Participant 8 articulated as /prəˌnʌnˑsiˈeɪˑʃən/. Participant 9 articulated as /prəˌnʌnˑsˈeɪˑʃən/. Finally, participant 10 as /prəˌnʌnˑsˈeɪˑʃən/. It is shown that participants 1, 2, 5, 6, and 8 pronounced correctly the word because they pronounced the word *pronunciation* as the native speaker. On the contrary, participants 3, 4, 7, 9, and 10 mispronounced the word because they pronounced the diphthong sound /eɪ/ instead of the triphthong sound /ieɪ/ in third syllable.

In summary, the results given by the above tables show in Figure 12 that participant 1 pronounced correctly 7 out of 8 words. Participant 2 pronounced correctly 3 out of 8 words. Participant 3 pronounced correctly 1 out of 8 words. Participant 4 pronounced correctly 1 out of 8 words. Participant 5 pronounced correctly 3 out of 8 words. Participant 6 pronounced correctly 3 out of 8 words. Participant 7 pronounced correctly 2 out of 8 words. Participant 8 pronounced correctly 2 out of 8 words. Participant 9 pronounced correctly 3 out of 8 words. Finally, participant 10 pronounced correctly 2 out of 8 words.

In my opinion, the results showed that participant 1 (P1) pronounces the English words following the least mother tongue pronunciation patterns, maybe because she is exposed to the English language than others. On the contrary, participant 3 (P3) and participant 4 (P4) pronounced the English words following the most mother tongue pronunciation patterns maybe because they are not so exposed to the English language than others as shown in Figure 11.

Figure 11. English-Spanish cognate words pronounced correctly by participants.



4.2.2 Participant-by-participant analysis

In order to complement the information given before and summarized in the last graph and to answer the first research question, the eight cognate words were transcribed into phonetic symbols with the help of (Fonemo Labs, 2012) to compare the Spanish sounds of each cognate word as shown in Figure 12.

Figure 12. Spanish transcription taken from Fonemo Labs.

Therefore, each Spanish cognate word and its phonetic transcription were listed in a table in order to make the comparison between English-Spanish sounds as shown below.

Spanish words	Spanish pronunciation transcribed into phonetic symbols with (Fonemo Labs, 2016).
Nativo	/naˈti.β̪o/
Crisis	/ˈkɾi.sis/
Futuro	/fuˈtu.ɾo/
Guardián	/gwaɾˈð̪jan/
Pirámide	/piˈɾa.mi.ð̪e/
Financiar	/fi.nãn̪ˈsiaɾ/
Biografía	/bjo.ɣɾaˈfia/
Pronunciación	/pɾo.nũn̪.siaˈsion/

After that, the eight Spanish words transcribed into phonetic symbols were listed with the English words transcribed into phonetic symbols as shown in Figure 10 and 12. Then, the articulation produced by each participant were listed in order to analyze their English pronunciation and to compare their pronunciation patterns to the English-Spanish sounds as shown in the below tables.

Participant 1 pronounced correctly 7 out of 8 words and they were the following as can be seen in the below table. It is shown that participant 1 articulated 7 out of 8 of the English-Spanish cognate words *almost entirely* approximated to the English articulation.

English words	**English articulation**	**1st Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈneɪ.tɪv/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkraɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·ʧər/	/ˈfju·ʧər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈgɔːr.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/faɪˈnæn.ʃəl/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/baɪˈɑː.grə.fi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·siˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

English words	**English articulation**	**2nd Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈna.tiːv/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkraɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·ʧər/	/ˈfju·ʧər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈgɔr.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpaɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.sɪal/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ.grə.fi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·siˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it is shown in the above table, participant 2 pronounced correctly 3 out of 8 words. It is shown that participant 2 articulated 5 out of 8 of the English-Spanish cognate words *a little* approximated to the Spanish articulation instead of the English articulation.

English words	**English articulation**	**3rd Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/na.ˈti:b/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkrɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈguar.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/pɪrˌə.ˈmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.ʃəl/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ. grə.pi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·sˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it can be seen in last table, participant 3 pronounced correctly 1 out of 8 words. It is shown that participant 3 articulated 7 out of 8 of the English-Spanish cognate words *almost entirely* approximated to the Spanish articulation instead of the English articulation.

English words	**English articulation**	**4th Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/na.ˈti:b/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkraɪ.si:s/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/fju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈguar.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/faɪˈnæn.sɪal/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/bɪˈɔ.grə.pi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·sˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it is shown in the above table, participant 4 pronounced correctly 1 out of 8 words. It is shown that participant 4 articulated 7 out of 8 of the English-Spanish cognate words *almost entirely* approximated to the Spanish articulation instead of the English articulation.

As it can be seen in the below table, participant 5 pronounced correctly 3 out of 8 words. It is shown that participant 5 articulated 5 out 8 of the English-Spanish cognate words *a little* approximated to the Spanish articulation instead of the English articulation.

English words	**English articulation**	**5th Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈneɪ.tɪv/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkrɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈgɑr.gi.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpaɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.ʃəl/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	ˈbɪɔ.grə.fi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·siˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it is shown in the below table, participant 6 pronounced correctly 3 out of 8 words. It is shown that participant 6 articulated 5 out 8 of the English-Spanish cognate words *a little* approximated to the Spanish articulation instead of the English articulation.

English words	**English articulation**	**6th Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈna.ti:b/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkraɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈgɔr.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpaɪr.ə.mɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnænsɪal/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ.grə.pi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·siˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

English words	English articulation	7th Participant's articulation	Spanish articulation	Spanish words
Native	/ˈneɪ.tɪv/	/na.ˈti:b/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkraɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/fju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/guar.ˈdi.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˈpɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.ʃəl/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ.grə.fi/	/bjo.ɣraˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·sˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it can be seen in last table, participant 7 pronounced correctly 2 out of 8 words. It is shown that participant 7 articulated 6 out of 8 of the English-Spanish cognate words *fairly* approximated to the Spanish articulation instead of the English articulation.

English words	English articulation	8th Participant's articulation	Spanish articulation	Spanish words
Native	/ˈneɪ.tɪv/	/na.ˈti:b/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkri:.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈguar.di.ən/	/gwaɾˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/pɪr.əˌmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.ʃəl/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ.grə.fi/	/bjo.ɣraˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·siˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it is shown in the above table, participant 8 pronounced correctly 2 out of 8 words. It is shown that participant 8 articulated 6 out of 8 of the English-Spanish cognate words *fairly* approximated to the Spanish articulation instead of the English articulation.

As it can be seen in the below table, participant 9 pronounced correctly 3 out of 8 words. It is shown that participant 9 articulated 5 out of 8 of the English-Spanish cognate words *a little* approximated to the Spanish articulation instead of the English articulation.

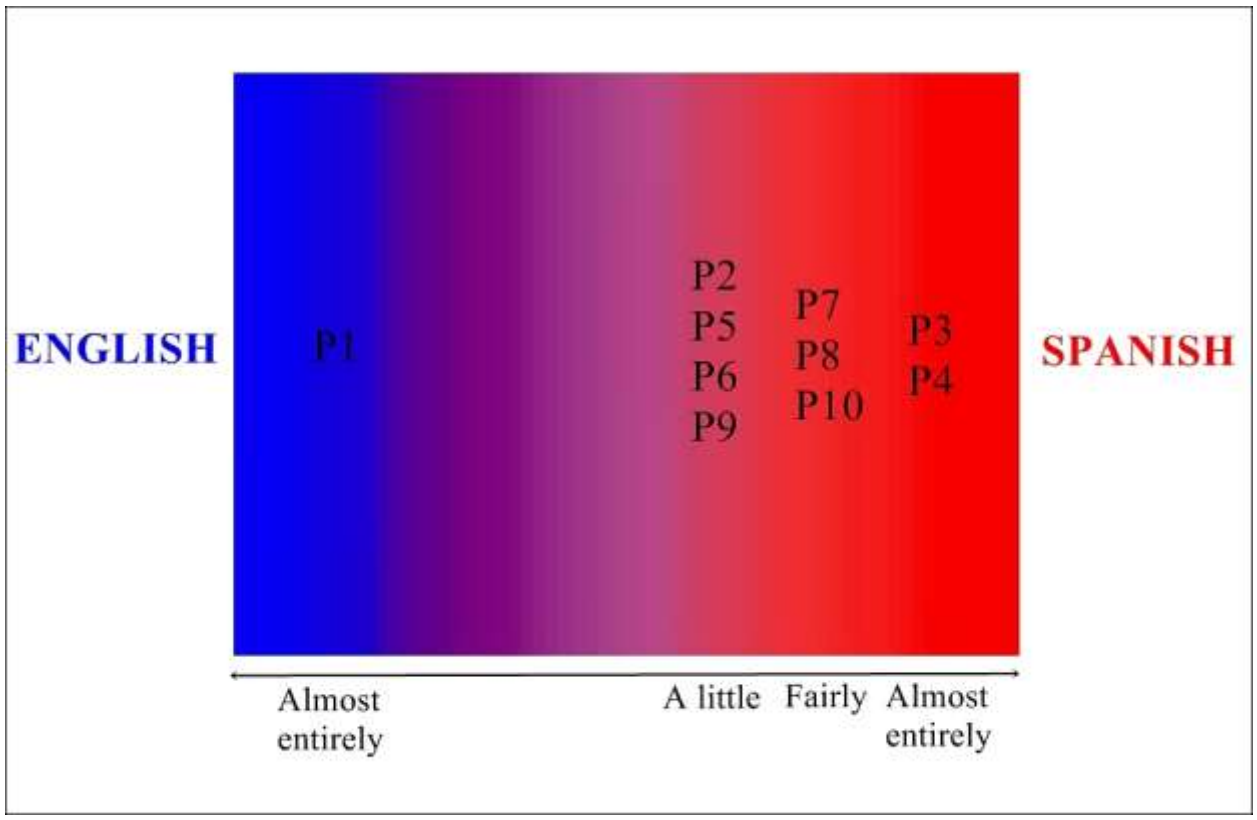
English words	**English articulation**	**9th Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈneɪ.tɪv/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkrɪ.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/ˈgɑr.dən/	/gwarˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˌpaɪr.əˈmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/fɪˈnæn.sɪal/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/baɪˈɑ.grə.fi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·sˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

As it is shown in the below table, participant 10 pronounced correctly 2 out of 8 words. It is shown that participant 10 articulated 6 out of 8 of the English-Spanish cognate words *fairly* approximated to the Spanish articulation instead of the English articulation.

English words	**English articulation**	**10th Participant's articulation**	**Spanish articulation**	**Spanish words**
Native	/ˈneɪ.tɪv/	/ˈneɪ.tɪv/	/naˈti.β̞o/	Nativo
Crisis	/ˈkraɪ.sɪs/	/ˈkriː.sɪs/	/ˈkɾi.sis/	Crisis
Future	/ˈfju·tʃər/	/ˈfju·tʃər/	/fuˈtu.ɾo/	Futuro
Guardian	/ˈgɑr.di.ən/	/guar.ˈdi.ən/	/gwarˈð̞jan/	Guardián
Pyramid	/ˈpɪr.əˌmɪd/	/ˌpaɪr.əˈmɪd/	/piˈɾa.mi.ð̞e/	Pirámide
Financial	/faɪˈnæn.ʃəl/	/ fɪˈnænʃɪal/	/fi.nãn̪ˈsiaɾ/	Financiar
Biography	/baɪˈɑ.grə.fi/	/ˈbɪɔ.grə.pi/	/bjo.ɣɾaˈfia/	Biografía
Pronunciation	/prəˌnʌn·siˈeɪ·ʃən/	/prəˌnʌn·sˈeɪ·ʃən/	/pɾo.nũn̪.siaˈsion/	Pronunciación

In summary, the results given by the above tables show in Figure 13 that participant 1 articulated the English-Spanish cognate words *almost entirely* approximated to the English articulation. Participants 2, 5, 6, and 9 articulated the English-Spanish cognate words *a little* approximated to the Spanish articulation instead of the English articulation. Participants 7, 8, and 10 articulated the English-Spanish cognate words *fairly* approximated to the Spanish articulation instead of the English articulation. Finally, participants 3 and 4 articulated the English-Spanish cognate words *almost entirely* approximated to the Spanish articulation instead of the English articulation.

Figure 13. English-Spanish approximated articulation by participants.



4.3 English sounds mispronounced by participants.

2. Which English sounds are mispronounced?

In order to answer the second research question, the data of the sounds produced when participants read aloud the word list showed that some sounds were mispronounced as shown in above tables from the first research question. These sounds were taken in order to show if the same participants mispronounced the sounds or not and they are shown in the below table.

Participant	**Vowels**									**Consonants**			
	/eɪ/	**/ɪ/**		**/aɪ/**	**/ɑ/**		**/ə/**	**/aɪɑ/**	**/ieɪ/**	**/v/**	**/d/**	**/ʃ/**	**/f/**
Participant 1					/ɔ/								
Participant 2	/a/	/i:/	/aɪ/	/ɪ/	/ɔ/		/ɪa/	/ɪɔ/				/s/	
Participant 3	/a/	/i:/		/ɪ/		/ua/		/ɪɔ/	/eɪ/	/b/			/p/
Participant 4	/a/	/i:/				/ua/	/ɪa/	/ɪɔ/	/eɪ/	/b/		/s/	/p/
Participant 5			/aɪ/	/ɪ/				/ɪɔ/			/g/		
Participant 6	/a/	/i:/	/aɪ/	/ɪ/	/ɔ/		/ɪa/	/ɪɔ/		/b/		/s/	/p/
Participant 7	/a/	/i:/		/ɪ/		/ua/		/ɪɔ/	/eɪ/	/b/			
Participant 8	/a/	/i:/		/ɪ/		/ua/	/ɪa/	/ɪɔ/		/b/		/s/	
Participant 9			/aɪ/	/ɪ/			/ɪa/		/eɪ/			/s/	
Participant 10		/i:/	/aɪ/	/ɪ/		/ua/	/ɪa/	/ɪɔ/	/eɪ/				/p/

As it is shown in the above table the mispronounced sounds by participants when they articulated the eight English-Spanish cognate words. They were divided into vowels and consonants as follows:

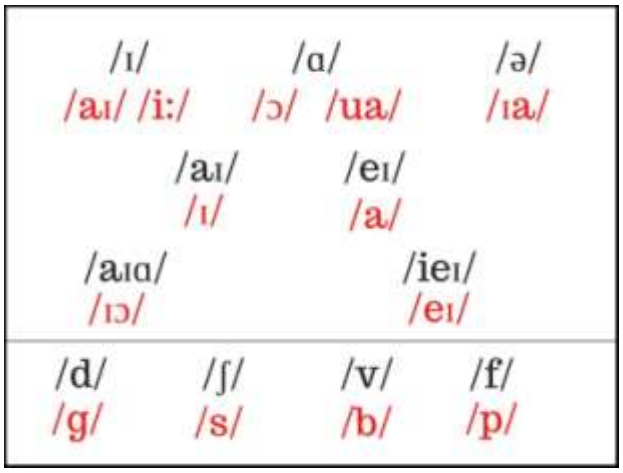
Diphthong sound /eɪ/was mispronounced as /a/ by participants 2, 3, 4, 6, 7, and 8. Vowel sound /ɪ/ was mispronounced as /i:/ by participants 2, 3, 4, 6, 7, 8, and 10. Diphthong sound /aɪ/

was mispronounced as /ɪ/by participants 2, 3, 5, 6, 7, 8, 9, and 10. Vowel sound /ɑ/ was mispronounced as /ɔ/ by participants 1, 2, and 6 and mispronounced as /ua/ by participants 3, 4, 7, 8, and 10. Vowel sound /ə/ was mispronounced as /ɪa/ by participants 2, 4, 6, 8, 9, and 10. Triphthong sound /aɪɑ/ was mispronounced as /ɪɔ/ by participants 2, 3, 4, 5, 6, 7, 8, and 10. Triphthong sound /ieɪ/ was mispronounced as /eɪ/ by participants 3, 4, 7, 9, and 10.

Consonant sound /v/ was mispronounced as /b/ by participants 3, 4, 6, 7, and 8. Consonant sound /d/ was mispronounced as /g/ by participant 5. Consonant sound /ʃ/ was mispronounced as /s/ by participants 2, 4, 6, 8, and 9. Consonant sound /f/ was mispronounced as /p/ by participants 3, 4, 6 and 10.

As a brief conclusion, it was shown that the most English sounds mispronounced were the vowel sounds with seven English sounds mispronounced as nine Spanish sounds. On the contrary, the least English sounds mispronounced were the consonant sounds with four English sound mispronounced as four Spanish sounds as shown in Figure 14. I think that it is possible to confirm that participants mispronounced more vowel sounds than consonant sounds because mother tongue pronunciation patterns influenced their foreign language pronunciation of these cognate words.

Figure 14. English sounds mispronounced as Spanish sounds



4.4 Exposure to English language

3. Does exposure to English language influence participants' articulation?

In order to answer the third research question, the data given by each answer when participants responded the eight questions (see Appendix B) was analyzed as shown in the following tables.

Question 1: How long have you been learning English? (Years).					
P1	0-2	2-4	4-6	6-8	8-10
P2	0-2	2-4	4-6	6-8	8-10
P3	0-2	2-4	4-6	6-8	8-10
P4	0-2	2-4	4-6	6-8	8-10
P5	0-2	2-4	4-6	6-8	8-10
P6	0-2	2-4	4-6	6-8	8-10
P7	0-2	2-4	4-6	6-8	8-10
P8	0-2	2-4	4-6	6-8	8-10
P9	0-2	2-4	4-6	6-8	8-10
P10	0-2	2-4	4-6	6-8	8-10

As it can be seen in the above table, participants 3, 4, 5, and 10 answered in question 1 that they have been learning English from 0 to 2 years. Participants 2, 7, and 8 answered that they have been learning English from 2 to 4 years. Participant 6 answered that he has been learning English from 6 to 8 years. Finally, participants 1 and 9 answered that they have been learning English from 8 to 10 years.

Question 2: How many hours in a week are you in contact with English language?					
P1	0-5	5-10	10-15	15-20	20-25
P2	0-5	5-10	10-15	15-20	20-25
P3	0-5	5-10	10-15	15-20	20-25
P4	0-5	5-10	10-15	15-20	20-25
P5	0-5	5-10	10-15	15-20	20-25
P6	0-5	5-10	10-15	15-20	20-25
P7	0-5	5-10	10-15	15-20	20-25
P8	0-5	5-10	10-15	15-20	20-25
P9	0-5	5-10	10-15	15-20	20-25
P10	0-5	5-10	10-15	15-20	20-25

As it is shown in the above table, participants 2, 3, 4, 5, 7, and 10 answered in question 2 that they are in contact with English language between 5 to 10 hours per week. Participants 1, 6, 8, and 9 answered that they are in contact with English language between 10 to 15 hours per week.

Question 3: How often do you speak in your English classes?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it can be seen in the above table, participants 1, 4, and 9 answered in question 3 that they *often* speak in their English classes. Participants 2, 3, 5, 6, 7, 8, and 10 answered that they *sometimes* speak in their English classes.

Question 4: How often do you pronounce words using phonetic symbols?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it is shown in the above table, participant 9 answered in question 4 that she pronounces words using phonetic symbols *very often*. Participants 1, 4, and 6 answered that they *often* pronounce words using phonetic symbols. Participant 5 answered that he *sometimes* pronounces words using phonetic symbols. Participants 3 and 10 answered that they pronounce words using

phonetic symbols *seldom*. Finally, participants 2, 7, and 8 answered that they *never* pronounce words using phonetic symbols.

Question 5: How often do you listen to music, radio or TV in English at home?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it can be seen in the above table, participants 3, 5, 6, 7, and 10 answered in question 5 that they listen to music, radio or TV in English at home *very often*. Participants 1 and 9 answered that they *often* listen to music, radio or TV in English at home. Finally, participants 2, 4, and 8 answered that they *sometimes* listen to music, radio or TV in English at home.

Question 6: How often do you read in English at school?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it is shown in the above table, participants 4 and 5 answered in question 6 that they read in English at school *very often*. Participants 1, 2, 3 and 9 answered that they *often* read in English at school. Finally, participants 6, 7, 8, and 10 answered that they *sometimes* read in English at school.

Question 7: How often does your teacher ask you to read aloud in the classroom?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it can be seen in the above table, participants 3, 4, 5, 7, 9, and 10 answered in question 7 that their teacher *often* asks them to read aloud in the classroom. Participants 1, 2, and 6 answered that that their teacher *sometimes* asks them to read aloud in the classroom. Finally, participant 8 answered that her teacher *never* asks her to read aloud in the classroom.

Question 8: How often do you write essays in English?					
P1	Very often	Often	Sometimes	Seldom	Never
P2	Very often	Often	Sometimes	Seldom	Never
P3	Very often	Often	Sometimes	Seldom	Never
P4	Very often	Often	Sometimes	Seldom	Never
P5	Very often	Often	Sometimes	Seldom	Never
P6	Very often	Often	Sometimes	Seldom	Never
P7	Very often	Often	Sometimes	Seldom	Never
P8	Very often	Often	Sometimes	Seldom	Never
P9	Very often	Often	Sometimes	Seldom	Never
P10	Very often	Often	Sometimes	Seldom	Never

As it is shown in the above table, participant 9 answered in question 8 that she writes essays in English *very often*. Participant 1 answered that she *often* writes essays in English. Participants 2, 4, 5, 7, and 8 answered that they *sometimes* write essays in English. Participants 3 and 6 answered that they write essays in English *seldom.* Finally, participant 10 answered that he *never* writes essays in English.

4.5 Conclusion

As it is shown in above tables, it is evident that each participant gave different answers and according to their exposure to English language it can be assumed that participants that are more exposed to English language mispronounce less English words, in contrast, participants that are less exposed to English language mispronounce more English words.

As a summary, it can be seen in Figure 13 that the English-Spanish approximated articulation by participants showed that participant 1 (P1) articulated *almost entirely* as the English pronunciation when she pronounced correctly 7 out of 8 words and that is related to the answers given by her that said that she has been learning English from 8 to 10 years, and she is in contact with English language from 10 to 15 hours per week, and in general, she is very *often* in contact with English language in her activities in the classroom and at home. On the contrary, participant 3 (P3) and participant 4 (P4) articulated *almost entirely* as the Spanish pronunciation when they pronounced correctly 1 out of 8 words and that is related to the answers given by them that said that they have been learning English from 0 to 2 years, and they are in contact with English

language from 5 to 10 hours per week, and in general, they are *never* in contact with English language in his activities in the classroom and at home as it is shown in the below table.

CHAPTER V: CONCLUSIONS

The aim of the present study was to compare the sound systems of English and Spanish, in order to identify the pronunciation patterns that a native Spanish speaker follows in the production of English words. In addition, the purpose of the study was to show if exposure to English language influences participants' articulation of English words.

5.1 Summary and Discussion

Once the analysis was performed and the results interpreted in Chapter IV, it was showed that participant (P1) was the only one that pronounced almost entirely approximated to the English articulation all the eight words when she pronounced correctly 7 out of 8 cognate words. In other words, P1 pronounced the English-Spanish cognate words following the least mother tongue pronunciation patterns much less than the other participants. Also, four participants (P2), (P5), (P6), and (P9) pronounced a little approximated to the Spanish articulation instead of the English articulation when they pronounced correctly 3 out of 8 cognate words. As a result, P2, P5, P6, and P9 pronounced the English-Spanish cognate words following more mother tongue pronunciation patterns than P1.

In addition, three participants (P7), (P8), and (P10) pronounced fairly approximated to the Spanish articulation instead of the English articulation when they pronounced correctly 2 out of 8 cognate words. As a result, P7, P8, and P10 pronounced the English-Spanish cognate words following more mother tongue pronunciation patterns than P2, P5, P6, and P9. Finally, two participants (P3), and (P4) pronounced almost entirely approximated to the Spanish articulation

instead of the English articulation when they pronounced correctly 1 out of 8 cognate words. As a result, P3, and P4 pronounced the English-Spanish cognate words following the most mother tongue pronunciation patterns than the other participants. These results show the lack of exposure to English language in any activity with any ability that participants P3 and P4 may have in comparison to P1.

Vowel sounds and consonants sounds were mispronounced by participants. However, vowel sounds were the most mispronounced sounds by participants with seven English sounds/eɪ/ /ɪ/ /aɪ/ /ɑ/ /ə/ /aɪɑ/ /ieɪ/ mispronounced as nine Spanish sounds /a/ /i:/ /ɔ/ /ɪ/ /aɪ/ /ɪa/ /ua/ /ɪɔ/ /eɪ/. In contrast, consonant sounds were the less English sounds mispronounced with four English sounds /v/ /d/ /ʃ/ /f/ mispronounced as four Spanish sounds /b/ /g/ /s/ /p/. According to these results, one factor that could be affecting the participants´ pronunciation is the lack of practice when participants pronounce English sounds. This is very serious; if participants and other students in similar circumstances do not practice English sounds with more frequency, they could develop fossilization.

As stated before, it was assumed that if participants are more exposed to English language they mispronounced less English words, and if they are less exposed to English language they mispronounced more English words. The data given by Chapter IV showed that participant that is more exposed to the English language mispronounced less English words, for example participant 1. On the contrary, it was showed that participant that is less exposed to the English language mispronounced more English words, for example participant 3. The results showed that participants' exposure to English language could affect participants' articulation.

5.2 Implications

The results obtained in this investigation suggest that LEI-students who have problems to pronounce the English-Spanish vowel and consonant sounds should work to improve their articulation in order to be intelligible when speak with native and non-native speakers. For that reason, I created some exercises to compare the differences between English-Spanish sounds and improve their pronunciation according to participants' mispronounced sounds.

/ɪ/ ≠ /aɪ/ - typical, syllable, crystal

/ɑ/ ≠ /ɔ/ spot, card, pot/sport, cord, port

/ə/ ≠ /ɪa/ - facial, commercial, social, special

/eɪ/ ≠ /a/ - native, afraid, aim

/ieɪ/ ≠ /eɪ/ - pronunciation, abbreviation, aviation

/ʃ/ ≠ /s/ - articulation, pronunciation, celebration

/f/ ≠ /p/ - phonetics, phonology, pharmacy

/ɪ/ ≠ /i:/ - it/eat bit/beat sit/seat

/ɑ/ ≠/ua/ - guardian, jaguar

/aɪ/ ≠ /ɪ/ - crisis, bilateral

/aɪɑ/ ≠ /ɪɔ/ - biography, biology

/d/ ≠/g/ - guardian, Cambodia, encyclopedia

/v/ ≠ /b/ - very, vast, valley

In the same way, it would be necessary to create English workshops for LEI-students focused on pronunciation with different activities, games or tasks to improve students' pronunciation.

LEI-teachers should make room in their lessons to teach the existing differences between English and Spanish sounds. In that way their students will realize that there are big differences between both languages. LEI-students should find opportunities to speak English more often, not only in the classroom in order to improve their pronunciation. Students could imitate English sounds in order to improve their pronunciation. Also, they could be exposed to the English language, for example, listening to English music, watching news, chatting with native speakers or going out with native speakers.

5.3 Limitations of the study

In the present study, limitations were part of the development of the project because I realized that some circumstances had to be improved to achieve a better research; those limitations are shown below:

First, the number of participants was different as planned. At the beginning of the project one hundred students were supposed to be part as the participants, but at the end only ten participated in the study because of the time and work, and ten students were good but a limited population in order to better answer the third research question.

Second, the word list could have been changed; instead of 8 English-Spanish cognate words I could have given some sentences and in that way, to compare different pronunciation elements like fluency and intonation, not only individual sounds and word stress. Another option could have been to use the word list and sentences instruments and in that way focusing on the comparison of English-Spanish sounds. Third, the questionnaire was limited because with 8 questions it was not possible at all to know exactly how participants are exposed to English language.

5.4 Suggestions for further research

As it was previously stated, this study only provided the basis for a larger project of a comparison of English-Spanish sounds. However, further work is necessary. The directions for further research are below.

First of all, a new study needs to have a much larger of participants if the aim of the project is to know if exposure to English language influences their articulation or not.

Second, when the instruments are applied, it could be better if some sentences are used instead of a word list, in that way could be known more about other pronunciation characteristics like *elision, fluency, intonation, linking, pause, rhythm* and *stress sentence,* for example. Alternatively, a longer word list could be used in order to make students articulate different English sounds.

Third, if a questionnaire is considered, it is suggested increasing the number of questions in order to have more information about the exposure to the language or the factors that could affect their language performance. Another way to improve this study could be to have a small number of students and to ask them directly about their language learning, like in an interview. Finally, videotaping their faces from three angles frontal and the other two by their sides, would be useful to watch which organs of speech participants use to pronounce the English-Spanish cognate words in order to have more accurate information instead of just audio recording. Researchers could also be interested in showing these videos to participants to help them to place their organs of speech in order to produce correctly any mispronounced sounds. Students of English Language Teaching could be interested in improving their articulation when they learn sounds and to teach them to their students in the future.

REFERENCES

Atomix Productions. (2016, February 20). *Virtual DJ*. Retrieved May 22, 2016, from http://www.virtualdj.com/products/virtualdj

Avery, P. (1992). *Teaching American English Pronunciation.* Oxford: Oxford University Press.

Bellem, A. (2009). *BBC Learning English.* Retrieved May 25, 2015, from Pronunciation Tips: http://www.bbc.co.uk/worldservice/learningenglish/grammar/pron/sounds/

Bradlow, A. R. (1995). *A comparative acoustic study of English and Spanish vowels.* New York, NY: Acoustical Society of America.

Cambridge University Press. (2016). *Cambridge Dictionaries Online*. Retrieved May 3, 2016, from Cambridge University Press: http://dictionary.cambridge.org/us/

Carter, R. (2012). *Vocabulary: Applied Linguistic Perspectives.* New York, NY: Routledge Linguistics Classics.

Celce-Murcia, M. (1996). *Teaching Pronunciation, a Reference for Teachers of English to Speakers of other Languages.* Cambridge, United Kingdom: Cambridge University Press.

Clark, J., Yallop, C., & Fletcher, J. (1995). *An Introduction to Phonetics and Phonology.* Cambridge, Massachusetts: Blackwell Publishers.

Derwing, T. M., & Munro, M. J. (1997). Accent, intelligibility, and comprehensibility. In M. L. Jette G. Hansen Edwards, *Phonology and Second Language Acquisition* (pp. 19: 1-16). Amsterdam, The Nederlands: John Benjamins Publishing.

Disner, S. F. (1984). Insights on vowel spacing. In I. Maddieson, *Patterns of sounds* (pp. 136-155). Cambridge: Cambridge University Press.

Ellis, R. (1994). *The Study of Second Language Acquisition.* Oxfordshire: Oxford University Press.

Flege, J. (1995). Second language speech learning: Theory, findings and problems. In W. Strange, *Speech perception and linguistic experience: Issues in cross-language research* (Second edition ed., pp. 229-273). Timonium, Maryland, U.S.A: York Press.

Fonemo Labs. (2012). *Teconologías para el Español*. Retrieved May 30, 2016, from Molino de Ideas: http://www.fonemolabs.com/

Gasser, M. (2009). *Word Forms: Units: Vowels.* Retrieved June 15, 2015, from How language works: http://www.indiana.edu/~hlw/PhonUnits/vowels.html

Guion, S. G., & Pederson, E. (2007). Investigation the role of attention in phonetic learning. In M. J. Ocke-Schwen Bohn, *Language Experience in Second Language Speech Learning: In Honor of James Emil Flege* (pp. 57-78). Amsterdam/Philadelphia: John Benjamins Publishing Company.

Hammond, M. (1999). *The phonology of English: A prosodic optimality - theoretic approach.* Oxford: Oxford University Press.

Hansen Edwards, J. G., & Zampini, M. L. (2008). Social factors and variation in production in L2 phonology. In J. G. Hansen Edwards, & M. L. Zampini, *Phonology and Second Language Acquisition* (pp. 251-280). Amsterdam: John Benjamins Publishing.

Harris, J. (1983). *Syllable structure and stress in Spanish.* Cambridge, Massachusetts: MIT Cambridge.

Hawkins, P. (1992). *Introducing Phonology.* California: Routledge.

Hualde, J. I. (2005). *The Sounds of Spanish.* Cambridge: Cambrigde University Press.

International Phonetic Association. (2005). *IPA Chart*. Retrieved October 10, 2015, from International Phonetic Alphabet: https://www.internationalphoneticassociation.org/content/full-ipa-chart

Krashen, S. D. (2003). *Principles and Practice in Second Language Acquisition.* California: Pergamon Press Inc.

Kuhl, P. K. (1987). Speech perception in early infancy. In L. B. Philip Salapatek, *Handbook of Infant Perception: From Perception to Cognition* (pp. 316-340). New York: New York Academic Press.

Levis, J., & LeVelle, K. (2012). *Social factors in pronunciation acquisition.* Iowa: Iowa State University.

MacMahon, M. (1996). Phonetic Notation. In P. T. Daniels, *The World's Writing Systems* (pp. 821-846). New York: Oxford University Press.

Moyer, A. (2004). *Age, Accent, and Experience in Second Language Acquisition: An Integrated Approach to Critical Period Inquiry.* Ontario, Canada: Multilingual Matters.

Ogden, R. (2009). *An Introduction to English Phonetics.* Edinburgh: Edinburgh University Press.

Roach, P. (2000). *English Phonetics and Phonology: A Practical Course, Volumen 1.* Cambridge: Cambridge University Press.

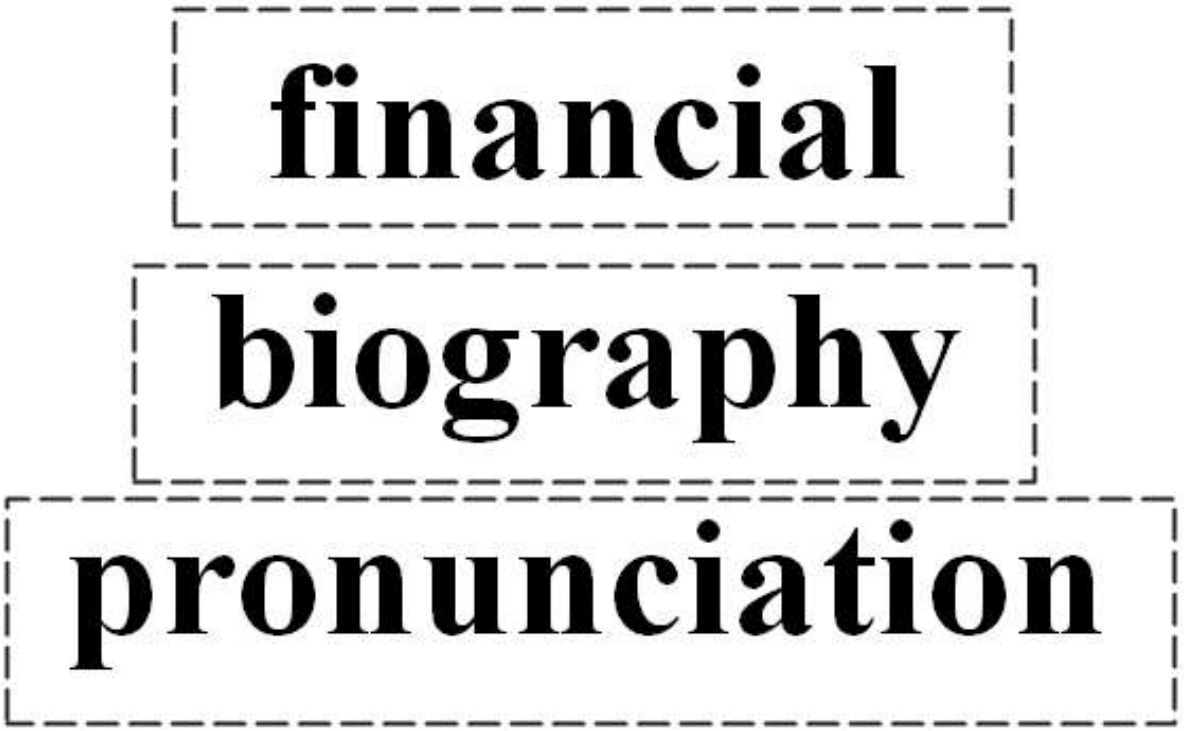
Sereno, J. A. (2007). Behavioral and cortical effects of learning a second language: The acquisition of tone. In M. J.-S. Bohn, *Language Experience in Second Language Speech Learning: In Honor of James Emil Flege* (pp. 239-258). Amsterdam/Philadelphia: John Benjamins Publishing Company.

SoundCloud. (2012, April 10). *SoundCloud*. Retrieved May 20, 2016, from https://soundcloud.com/aangelmendozaa/sets/native-speaker-non-native-speakers/s-2WuRq

Tumuyu, P. C. (2010, February 20). *English questionnaire*. Retrieved July 10, 2014, from Scribd: https://es.scribd.com/doc/27149880/English-questionnaire

Weinreich, U. (1979). *Languages in Contact: Findings and Problems.* New York, NY: Linguistic Circle of New York.

Appendix A. Word cards


financial
biography
pronunciation

Appendix B. Questionnaire

Circle the answer more appropriate for you.

1) How long have you been learning English? (Years).

0-2	2-4	4-6	6-8	8-10

2) How many hours in a week are you in contact with English language?

0-5	5-10	10-15	15-20	20-25

3) How often do you speak in your English classes?

Very often	Often	Sometimes	Seldom	Never

4) How often do you pronounce words using phonetic symbols?

Very often	Often	Sometimes	Seldom	Never

5) How often do you listen to music, radio or TV in English at home?

Very often	Often	Sometimes	Seldom	Never

6) How often do you read in English at school?

Very often	Often	Sometimes	Seldom	Never

7) How often does your teacher ask you to read aloud in the classroom?

Very often	Often	Sometimes	Seldom	Never

8) How often do you write essays in English?

Very often	Often	Sometimes	Seldom	Never

Appendix C. Audio software