



**Catalan learners of English as a Second
Language: perception and production of the
Schwa**

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ABSTRACT

This work is mainly focussed on the schwa phoneme. It is a critical review of its singularities regarding English and Catalan, and gives account of its use at segmental and supra-segmental levels. Throughout the essay, several instances are given in order to show the similarities between both languages concerning the schwa. The paper is divided into two major parts: a theoretical and a practical approach. The theoretical one is a critical review of several aspects such as vowel reduction and stress timing, among others. The practical approach, which involves a test and a survey, is based on various activities designed specifically to evaluate the perception and production of the schwa among Majorcan learners of English as a Second Language.

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1. Introduction

The topic of this work deals with the correspondence of the English schwa and Catalan *e neutra*. This paper has two main sections: a theoretical frame and a practical approach. The main features of the schwa and its similitudes with the Catalan *e neutra* are established in the theoretical section of this paper. The practical approach is an experimental study that aims at determining the perception and production of this particular sound from the perspective of Majorcan students of English as a Second Language (ESL). The election of this topic is motivated by the premise that it is possible to take advantage of this correspondence between the two sounds in order to help students improve their perception and production of the schwa in English. The positive transfer that emerges from the correlation between both sounds could be used in a classroom of Majorcan students of English as a SL. Consequently, raising awareness in these students about the equivalence of both sounds would help them develop perception and production skills in order to achieve a better pronunciation of the schwa in the target language (TL) they are learning, English in this case.

1.1. Hypothesis and Objectives

This work aims at giving proof of the following hypothesis:

Since the English schwa phoneme /ə/ and Catalan neutral /ə/ share some similitudes at both segmental and supra-segmental levels, it is possible to take advantage of these similarities in the classroom. In order to achieve this aim, it is necessary to raise awareness in teachers and students of the particular schwa features and develop concrete teaching methodological strategies. Since the schwa phoneme is the most recurrent sound in English and has a major impact on the English pronunciation, specific teaching and learning methods could be applied to Catalan learners of English as a Second Language (ESL). The perception and production of the schwa in both languages could help Catalan students to achieve a more natural and better pronunciation of English.

The main hypothesis of this work is based on the premise that Catalan students of ESL could make use of the correspondence between the English schwa and the Catalan neutral /ə/ to improve their perception and production of the English schwa. The practical approach of this work has been specifically designed for native Majorcan students of ESL in order to give proof of this hypothesis.

1.2. Objectives

The following objectives need to be accomplished in order to demonstrate the main hypothesis:

1. To describe the similarities of the phonemes compared: English schwa and Catalan neutral /ə/.
2. To recognize the English schwa and Catalan neutral /ə/ in isolated words and at a prosodic level.
3. To recognize the differences between strong and weak syllables that involve the production of the /ə/ sound.
4. To show that students could use this correspondence between both sounds to perceive and produce the English schwa more accurately in isolated words and at a sentence level.

On the one hand, the theoretical section of this paper, in which the main features of the English schwa and Catalan /ə/ *neutra* are displayed, deals with objective n° 1. On the other hand, the practical approach, in which the experimental study is carried out, mainly deals with objectives n° 2, n° 3 and n° 4.

1.3. State of the Art

There are no studies that focus particularly on the comparison between the English schwa and the Catalan neutral vowel /ə/. Nevertheless, some authors such as Norman Coe (2005) or Joan-Julià Muné (2001) compare the vowel system of Catalan and English and mention the relation between these two vowels. For instance, Norman Coe wrote a whole chapter of the book *Learner*

English: A Teacher's Guide to Interference and Other Problems about speakers of Spanish and Catalan who learn English as a SL. In his text, he states that:

“Catalan shows a more marked difference between stressed and unstressed syllables, including a neutral vowel like /ə/ in unstressed positions. Catalan is also more stress-timed (with similar time-intervals elapsing between stress and stress, as in English, rather than between syllable and syllable), but these features are still not as marked as in English. Thus, while Catalan learners typically connect more closely to English sentence rhythm, there is still a remaining margin of difference to be overcome.”

(Swan, M., & Smith, B.: 2001).

Taking this statement into account, it is feasible to think that Catalan learners of English should be able to take advantage of this common neutral vowel /ə/ between English and Catalan in order to improve their production of the English schwa. Not only would this awareness have a positive impact at a segmental level, but also, and even more importantly, at a supra-segmental or prosodic level; since the /ə/ phoneme intervenes directly in the way sounds blend with each other and contributes to create a more stress-timed language.

Needless to say, this feature is reciprocal: an English learner of Catalan could also benefit from the awareness of the way in which the English schwa and Catalan /ə/ neutral work at a sentence level in order to produce a more accurate and natural Catalan pronunciation.

The Catalan author Joan-Julià Muné in his book *Fonètica aplicada Catalana* (2005) spends a whole chapter talking about the process of learning and teaching second and foreign languages to Catalan speakers. Among others, English is one of the languages being analysed. According to him, the English

/ɜ:/ and /ə/ vowel sounds which belong to the central segment of the quadrilateral vowel are practically identical to the Catalan neutral /ə/. Nevertheless, the English sounds /ɜ:/ and /ə/ differ in duration depending on whether the sound is in a stressed or non-stressed position. Thus, for instance, at a segmental level, one could find the /ɜ:/ sound in words such as *bird* /'bɜ:d/ or *girl* /'gɜ:l/ and the schwa sound /ə/ in words such as *again* /ə'geɪn/ or *album*

/'ælbəm/. Considering this fact, it is also relevant for Catalan teachers and learners to

become aware of this difference in length when referring to these central vowel sounds since Catalan speakers do not make this distinction. Also, for an English learner of Catalan it would be necessary to make them notice that the neutral /ə/ in stress position does not change its length in Catalan.

Taking all the above commentaries into account, it seems clear that there is a correspondence between the English schwa vowel and the Catalan neutral /ə/. Nevertheless, Catalan is a language that has a wide range of dialects and not all of them display exactly the same vowel inventory. Max W. Wheeler, in his book *The Phonology of Catalan* (2005), gives account of the differences among the Eastern, Western and Balearic varieties (including Majorcan) of Catalan with respect to vowel reduction and the presence of the schwa. Thus, it is important to have in mind that not all varieties of Catalan have the schwa phoneme in their vowel inventory. Thus, English learners of distinct Catalan varieties will perceive and produce the schwa differently according to the Catalan variety they speak. Consequently, when analysing the similitudes and differences between English and Catalan schwa sounds, it will be necessary to specify which Catalan varieties display the schwa in their vowel inventory. Such varieties are the Eastern varieties of Catalan (North Catalan, Central Catalan, Balearic and Alguerès) which have the neutral /ə/ in the phonetic inventory or undergo some kind of vowel reduction that involves the production of the /ə/ sound. Obviously, to cope with the aims of this work, most of the examples given will refer to those Catalan varieties where the schwa sound is most frequent, since their speakers will be able to compare their own neutral /ə/ with the English schwa.

Furthermore, in the study *Phonotactic and phrasal properties of speech rhythm. Evidence from Catalan English and Spanish* (Prieto, Pilar, et al., 2012), published as an article in *ScienceDirect*, the effect of vowel reduction at sentence level is also treated when it comes to determine whether a language is stress-timed or syllable-timed. Among other aims, this study tried to determine if Catalan could be really classified as an “intermediate” language between a “syllable-timed” language such as Spanish or a pure stress-timed language such as English.

Catalan vowel reduction¹ is a phenomenon which involves the neutralization of some vowels into the schwa sound. For instance, a Catalan word such as *casa* /kázə/, in which the /a/ vowel belongs to the stressed syllable, would neutralize into /ə/ when forming the diminutive *caseta* /kə'sətə/.

Finally, as has been already stated, there are some authors that compare the phonetic systems of English and Catalan. Nevertheless, they usually offer a broad vision of the similarities between both vowel inventories without particularly focussing on specific sounds. Nevertheless, this work tries to look closer at the /ə/ vowel and its particularities regarding these two languages. In order to do so, the Standard English or Received Pronunciation (RP) is taken as a model to give instances of the English schwa, and the Majorcan dialect is mainly used to give examples of the neutral /ə/ since the practical approach of this work is addressed to native Majorcan students of English.

1.4. Methodology

As for the theoretical frame of this work, which involves the research of works related to the concerned matter, the methodology will encompass the reading and critical review of several books, studies and articles. This research will constitute the theoretical basis for applying this knowledge to a specific classroom environment. In this particular case, Catalan students who learn English as a Second Language (SL).

To cope with the more practical frame of the work, several activities have been specifically designed to test the perceptive and productive skills regarding the schwa. Such activities are aimed at evaluating the learning process resulting from the comparison between the English schwa and the Catalan e neutra. Students will be tested on perceiving the similarities between both sounds, and then they will be asked to produce the sound at a segmental level (isolated words), and at a supra-segmental level (sentence level) in both languages.

¹ <http://www.ub.edu/sonscatala/ca/glossari/reduccio-vocalica>

After that, a survey will be carried out in order to reach conclusions about the usefulness and viability of the activity to improve their level of awareness concerning this specific sound.

As available resources to carry out this practical approach, a bilingual teacher of English and Catalan will test Majorcan adult students in the Intermediate 2 level of the *Escuela Oficial de Idiomas of Palma de Mallorca*.

2. General Phonetic concepts

This section aims at introducing some basic concepts which are relevant to the understanding of the subsequent chapter relating to the description of the two vocalic systems, Catalan and English.

2.1. Phonetics and phonology

At the beginning of the 20th century, the linguist Ferdinand de Saussure established a crucial distinction between *langue* and *parole*. According to Saussure, *langue* refers to the abstract knowledge of a language which is shared by all their speakers, and *parole* refers to concrete examples of speech acts uttered by an individual. The implementation of these two concepts (*langue* and *parole*) to the phonic field meant the distinction between phonology and phonetics as separate disciplines. Thus, on the one hand, phonetics deals specifically with the physical description and variations of the different sounds of a language; that is to say, its *parole*. On the other hand, phonology tackles with the linguistic knowledge that the speakers of a language have about it or its *langue*. Nevertheless, phonetics and phonology are two complementary disciplines since there are many phonological issues that can be explained from a phonetic point of view, and, at the same time, phonetic observations can be approached from a phonological point of view and then acquire a new perspective. (Prieto i Vives: 2004, p. 159).

Moreover, phonetics studies the physical proprieties of the sound and the way of producing it (articulatory phonetics), the way of transmitting it (acoustic phonetics),

and the way of perceiving it (auditory phonetics). (Lloret, 2011, p. 5). Part of the practical approach of this work will deal with auditory phonetics and articulatory phonetics since the way in which Majorcan learners of English perceive and produce the schwa in English and Catalan will be tested.

2.2. IPA²

The International Phonetic Alphabet³ (IPA) was developed in the 19th c. and it is an alphabet created to represent the pronunciation of languages. One of its aims is to provide a unique symbol for each distinctive sound (phoneme) in a language in order to differentiate one word from another. The IPA uses Roman characters, and diacritics are employed to make precise distinctions between sounds, and to show different particularities such as nasalization of vowels, length, stress and tones. Moreover, it can be used for broad and narrow transcription. Peter Roach in his book *English Phonetics and Phonology* gives the following definition concerning the term narrow and broad phonetic transcription.

A phonetic transcription containing a lot of information about the exact quality of the sounds would be called a narrow phonetic transcription, while one which only included a little more information than a phonemic transcription would be called a broad phonetic transcription.

(Roach: 2009, p. 34)

The broad phonetic transcription will be mainly used throughout the present document when providing phonetic examples of words and sentences.

2.3. Phoneme, allophone and minimal pair

A phoneme can be described as “the smallest distinctive unit in the structure of a given language” (Ladefoged and Johnson: 2010, p. 309). It is an abstract entity and possesses a distinctive capacity; that is to say, it is possible to distinguish words which have sounds that belong to different phonemes.

² The information about the IPA has been obtained from the following website:
<https://www.britannica.com/topic/International-Phonetic-Alphabet>

³ The IPA chart can be consulted at the following website:
https://www.internationalphoneticassociation.org/sites/default/files/IPA_Kiel_2015.pdf

Nevertheless, “an allophone is a variant of a phoneme. The allophones of a phoneme do not change the meaning of a word, are very similar to one another, and occur in phonetic contexts that are different from one another”. (Ladefoged and Johnson: 2010, p. 72).

In this work, minimal pairs of words will sometimes be used when giving examples. Minimal pairs are “pairs of words in which the difference in meaning depends on the difference of just one phoneme” (Roach: 2009, p.51).

2.1 Syllable definition

Before moving to the next section regarding stress, it is necessary to provide a definition for the term *syllable*. According to the English Oxford dictionary, a syllable is “a unit of pronunciation having one vowel sound, with or without surrounding consonants, forming the whole or a part of a word”.

2.2 Strong and weak syllables

Another basic concept to consider is the difference between strong and weak syllables. This feature applies both to Catalan and English and has paramount importance regarding pronunciation.

When a vowel is in a weak syllable it has a tendency to be produced shorter, in a lower intensity, and has a different quality than a strong one (Roach: 2009, p. 64). For instance, in English, if the two-syllable word *matter* /'mætə/ is taken as an example, the second syllable is weaker, shorter and softer than the first stronger one. Moreover, this second syllable is the schwa vowel /ə/, which is the most recurrent weak vowel in English. Likewise, in Catalan, there is also this distinction between weak and strong syllables. For example, in the Catalan word *padrí* /pə'ði/ (grandfather) there is a first syllable which is weaker than the second one that involves the schwa sound /ə/. Strong and weak syllables can be referred to in terms of stress. That is to say, strong syllables would be stressed and weak syllables would be unstressed.

2.4. Stress

Peter Roach in his book *English Phonetics and Phonology* (2009) states the characteristics of the stress. According to him, it is possible to study the stress phenomenon from two different perspectives: production and perception. Both approaches are related to each other. On the one hand, from the point of view of the production, there is more muscular effort involved in producing a strong or stressed syllable than an unstressed or weak one. Thus, when a stressed syllable is produced, the muscles involved in expelling the air from the lungs are more active and, as a consequence, there is a higher pressure than when an unstressed syllable is produced. On the other hand, from the point of view of the perception, stressed syllables are more prominent than unstressed ones, and that is the reason why stressed syllables are easier to recognize than non-stressed syllables. Thus, the perception of the prominence is a relevant factor when it comes to stress. (Roach: 2009, p. 73).

Prominence depends on 4 main factors:

1. Loudness: Perceptually, stressed syllables are louder than unstressed ones.
2. Length: If one of the syllables is longer than the others, there is a tendency to perceive the longer one as stressed.
3. Pitch: If one of the syllables has a more noticeable pitch with respect to the others, it will probably carry more prominence.
4. Quality: When a syllable contains a vowel, which has a different quality than the surrounding ones, it will be more prominent.

These four factors are usually combined even though in some cases only one or two appear. (Roach: 2009, p. 74).

2.5. Stress timed-rhythm and syllable-timed rhythm

The terms *stress timed* and *syllable timed* were coined in 1945 by the linguist K.L. Pike⁴. Pike used these terms to differentiate two types of rhythm. English is considered to have a stress-timed rhythm because the accented syllables tend to occur at quite regular time intervals, and the unaccented syllables between these accented ones have a tendency to be compressed. Moreover, English rhythm is determined by the contrast between prominent and non-prominent parts. As has been stated in section 2.3 about stress, prominent syllables are distinguishable by pitch movement, strong vowel quality, length and stress (loudness). In contrast, non-prominent parts of speech lack one or some of the qualities that prominent syllables have, and their compression degree depends on the number of non-prominent syllables forming the group, and whether they occur before or after the beat. It is important to mention that it is precisely within the non-prominent group of syllables where connected speech processes, such as elisions, assimilations, and compressions which tend to take place. On the contrary, languages with a syllable timed rhythm, such as Spanish, display the rhythm on each of the syllables, being these stressed or not. Thus, in the case of Spanish, all the syllables tend to occur at fairly regular intervals. (F. Finchand Ortiz Lira:1982, p. 115-116).

2.6. Segmental and Supra-segmental levels

The production of any speech chunk implies 2 features which can be analysed at two different levels (Estebas: 2014):

5. The segmental level: “It includes the articulation of a series of sounds (vowels and consonants), also known as segments”.
6. The supra-segmental level: it includes “the production of a series of *supra-segmentals* that involve more than consonants and vowels and include features such as stress, length, intensity, and intonation”.

⁴ <https://www.nap.edu/read/10992/chapter/16>

Moreover, Peter Roach in his book *English Phonetics and Phonology* (2009) states that another term for *supra-segmental phonology* is *prosodic phonology* or *prosody*.

3. Catalan and English Vowel Systems

The main goal of this chapter is to briefly present the basic idiosyncratic characteristics of the two languages, Catalan and English, mainly focussing on the schwa sound and its shared similarities between both languages.

3.1. Catalan

This section centres on the particular characteristics of the different Catalan varieties (Eastern, Western and Majorcan varieties) in relation to the production of the schwa vowel.

3.1.1. Catalan Dialects

Catalan dialects are divided into two main groups. Such division is based on phonological differences, verb morphology and lexical differences. On the one hand, there is the eastern group which includes North Catalan (rossellonès), Central Catalan (Barcelona, northern and eastern Catalonia), Balearic, and Alguerès (the Catalan variety spoken in Alguer). On the other hand, north-western Catalan and Valencian, which is a Catalan dialect, belong to the western group. One of the main features which serves to establish the differences between these two major groups entails vowel reduction in non-stressed syllables. This phenomenon implies that in the eastern dialects the /a/ sound turns into a /ə/ sound in unstressed syllables, and, most of the times /e/ and /i/ are reduced to /ə/. (W. Wheeler: 2005, p. 2-3).

3.1.2. Catalan Vowels

This section deals with the basic Catalan phonetic features relating to vowels. The Central Catalan is taken as a standard reference to describe the Catalan vocalic system, even though there are other Catalan varieties which show some differences. If some of them have special relevance to the central topic of this paper, they will be mentioned. Since the focus of this work is the correlation between the Catalan e neutra and the

English schwa, this section is mainly addressed to explain the Catalan /ə/ sound in stressed and non-stressed position. The rest of the vowels of the Catalan vocalic system will only be mentioned.

3.1.3. Catalan Vowels in Stressed position

The following inventory of 7 vowels can be found in stressed position in the Central Catalan dialect. It can be appreciated that the words from the subsequent board⁵ are only distinguished by means of one phoneme that is different in each word, in this case the vocal sound.

Catalan word	Vowel	Transcription	Meaning
sic	/i/	/ˈsik/	Catalan adverb meaning <i>this way</i>
cec	/e/	/ˈsek/	Catalan adjective meaning <i>blind</i> .
sec	/ɛ/	/ˈsɛk/	Catalan adjective meaning <i>dry</i> .
sac	/a/	/ˈsak/	Catalan noun meaning <i>saco</i> .
sóc	/o/	/ˈsok/	First-person singular of the verb <i>to be</i> in Catalan. It means <i>I am</i> .
soc	/ɔ/	/ˈsɔk/	Catalan noun meaning <i>strain</i> .
suc	/u/	/ˈsuk/	Catalan noun meaning <i>juice</i> .

Most of the Catalan dialects share the above vocal system. However, one of the main traits of the speakers of the Balearic Islands is the use of the /ə/ sound in stressed position and, consequently, this Catalan dialect consists of an inventory of 8 vowel sounds. For instance, a Majorcan speaker would say /ˈsək/ (dry) and /ˈpərə/ (pear), and the /ə/ sound would appear either in stressed and non-stressed position. (Prieto i Vives: 2004, p.220).

Thus, the Balearic vocal system, apart from the 7 vowels corresponding to the Central Catalan in stressed position, includes one more phoneme which corresponds to the *e neutra*. This *e neutra* phoneme finds its identical equivalence in the English schwa

⁵ The examples from the board have been taken from the book *Fonètica aplicada catalana: dels fonaments a les aplicacions de les ciències fonètiques* de Joan Julià i Muné. Also, Pilar Prieto i Vives uses the same examples in her book *Fonètica i Fonologia. Els sons del català*.

schwa with the only difference that in English the schwa sound only appears in non-stressed position.

Moreover, the English phoneme /ɜ/, which can be found in words, such as bird /bɜ:d/, or work /wɜ:k/, is very similar in quality to the English schwa, but the last one is much shorter. (Estebas: 2014, p. 60). Thus, taking into account this similar quality between these two vowels, /ɜ/ and /ə/, it is possible to think that the Majorcan *e neutra* in stressed position is similar in quality to the vowel /ɜ/, which in English is also found in stressed position. And, even though in Catalan there is no distinction in vowel length, it is possible to think that the *e neutra* in stressed position will last longer than the *e neutra* in unstressed position, and consequently will be similar in length to the English /ɜ/.

It is important to mention that this Balearic /ə/ in stressed position comes from the Medieval Catalan and was implemented in the Balearic Islands in the 13th and 14th centuries and has been kept since then. However, as for the Central Catalan, the /ə/ in stressed position evolved into an /ɛ/, and as a consequence, the word *pera* would be pronounced as /'pɛrə/, keeping only the schwa sound in the non-stressed second syllable of the word.

3.1.4. Catalan Vowels in Non-stressed position

The Central Catalan vowel inventory in non-stressed position consists of 3 vowels: /i/, /u/ and /ə/. The /ə/ sound, *e neutra*, in non-stressed position appears in Central Catalan and Majorcan. Hence, nouns such as *cremat* /crə'mat/ (burned) and *maleta* /mə'lətə/ (suitcase) have this *e neutra* sound equivalent to the English schwa in non-stressed position. It can be observed that in the word *maleta* /mə'lətə/ it is possible to find 3 schwa sounds in the same word. The first and the third syllable would correspond to the *e neutra* in non-stressed position while the second syllable would correspond to the *e neutra* in stressed position. However, other Catalan dialects such as Valencian, which belongs to the western group of Catalan dialects, do not use this *e neutra* in non-stressed position. So, for instance, a Valencian speaker would pronounce the word *cremat* as /cre'mat/ without using the schwa sound. (Prieto i Vives: 2004, p.227).

3.1.5. Vowel Reduction in Catalan

Vowel reduction is a feature of all Catalan varieties and refers to “the neutralization of some vowel contrasts in unstressed syllables” (Max W. Wheeler: 2005 p.52). In Catalan, the stress of the vowel determines its quality. Thus, the vowel quality changes if such vowel is in a stressed position or in an unstressed one. Moreover, since lexical words have usually only one stress, the effects of vowel reduction are mainly displayed in inflected and derived words. For instance, in the case of the Central Catalan and the Majorcan dialect, when the vowels /e/, /ɛ/ and /a/ are in a non-stressed syllable, these are produced as the neutral sound /ə/. So, the vowel sounds /e/ (cec /'sek/), /ɛ/ (sec /'sɛk/) and /a/ (sac /'sak/) which in stressed position have all their characteristic vowel sounds would undergo a process of vowel reduction when forming a derivative and would turn into the schwa vowel /ə/ (Prieto i Vives: 2004, p. 232-33). The process would be the following:

Noun	Vowel	Transcription	Derivative	Transcription
cec	/e/	/'sek/	ceguesa	/sə'ɣzə/
sec	/ɛ/	/'sɛk/,	segueu	/sə'ɣew/
sac	/a/	/'sak/,	sacada	/sə'kaðə/

Regarding the derivative of the above examples, now the vowels corresponding to the primitive noun are in an unstressed position. As can be noticed, when these vowel sounds are in a non-stressed position in the derivative they turn into the neutral sound /ə/. In English, the distribution of the stressed and non-stressed syllables in a word determines the main accent of the word and the schwa sound always appears in the non-stressed position, which in these examples coincides with these Catalan varieties. Thus, in these derivatives the main accent of the words falls on the second syllable, and the schwa is found in the first syllable.

Furthermore, in the following examples of Majorcan vowel reduction, it can be seen how the vowels /ɛ/, /e/, /ə/ and /a/, which are in stressed position in the root words, become an /ə/ when being in an unstressed position in the derivatives. There is also

a displacement of the main accent of the words which in the derivatives falls on the second syllable.

Base form	Transcription	Meaning	Base + stressed suffix	Transcription	Meaning
gel	/ˈʒɛl/	ice	gelat	/ʒəˈlat/	ice cream
perdre	/ˈpɛrðrə/	lose	perdem	/pɛrðəm/	We lose
pera	/ˈpɛrə/	pear	perera	/pɛˈrərə/	pear tree
pedra	/ˈpɛðrə/	stone	pedrera	/pɛˈðrərə/	quarry
banya	/ˈbanə/	He bathes	banyam	/bəˈɲam/	We bathe

Regarding other eastern Catalan varieties such as Central and North Catalan and the Balearic dialects of Minorca and Ibiza, they also experiment the phenomenon of vowel reduction in the derivatives. Thus, as in the Majorcan dialect, these non-high unrounded vowels (/ɛ/, /e/, /ə/ and /a/), are neutralized as a schwa in unstressed position. Nonetheless, if we compare the eastern phonetic transcription of the words from the above board with that of the Majorcan dialect, there is a significant difference in pronunciation concerning the stressed vowel in all of them except for the word *gelat*. The comparison of the Majorcan phonetic transcription of these words with the rest of Catalan eastern varieties can be observed in the board below. (Max W. Wheeler: 2005 p.54).

Word	Majorcan	Other eastern varieties
gelat	/ʒəˈlat/	/ʒəˈlat/
perdem	/pɛrðəm/	/pɛrðɛm/
perera	/pɛˈrərə/	/pɛˈrɛrə/
pedrera	/pɛˈðrərə/	/pɛˈðrɛrə/
banyam	/bəˈɲam/	/bəˈɲɛm/

It can be observed that even though all eastern varieties undergo the process of vowel reduction in the non-stressed syllable, it is only the Majorcan dialect that also shows

the schwa sound in the stressed position. Thus, in Majorcan, the words *perdem*, *perera*, and *pedrera* have the schwa in both stressed and unstressed positions. This particular fact implies that the Majorcan dialect displays, in general, a major use of the schwa sound in its word inventory.

3.1.6. Catalan Diphthongs, triphthongs, and hiatus⁶.

A diphthong is a group of 2 consecutive vowels which are pronounced within the same syllable and one of them is an atonic (without accent or stress) *i* or *u*. This atonic *i/u* works as an intermediate sound between a consonant and a vowel and they are called *graduals* or *aproximants* (semivowels).

Catalan diphthongs are divided into two groups: *diftongs decreixents* and *diftongs creixents*.

The *diftongs decreixents* are the ones in which *i/u* appear after a vowel. The following Catalan words constitute examples of these types of diphthongs:

- **mai** (never), **remei** (remedy), **noi** (boy), **cuina** (kitchen), **pau** (peace), **veure** (to see), **viure** (to live), **pou** (well, shaft), **duu** (3rd p.s. of the verb *to carry*).

The *diphthongs creixents* are the ones in which *i/u* comes before a vowel and after *g/q*. The following words are examples of *diphthongs creixents*.

- *gual* (entrance, access), *aigües* (water), *pingüí* (penguin), *paraiguot* (big umbrella), *pasqua* (Easter), *freqüent* (frequent), *adeqüi* (3rd p. s. subjunctive of the verb *to adapt*), *quota* (membership fees).

In a *diftong creixent* *i/u* can also be at the beginning of a syllable or a word, as in the next examples:

⁶ The information of this section has been summarized from the dossier of *Fònètica Catalana* de Anna Maria Ribas Margarit which can be found at the following internet address http://www.annaribas.cat/01_fonetica/FONETICA%20CATALANA.pdf

- *noia* (girl), *hiena* (hyena), *iodo* (iodine), *pouar* (extract water from a well), *clauer* (key ring), *iuca* (cassava).

A *Catalan triftong* (triphthong) is a group made of three consecutive vowels which belong to the same syllable and two of them are *i/u*. Some examples would be the following:

- *iai* (grandfather), *Paraguai* (Paraguay), *fèieu* (2nd p. s. past of the verb *to be*), *creueu* (2nd p. p. present of the verb *to cross*), *liqüeu* (2nd p. p. present of the verb *to blend*), *miau* (miaow), *guaitar* (lean out), *pouaire* (someone who cleans wells, shafts).

A hiatus is formed by two vowels which are together but belong to different syllables. Thus, both vowels constitute a syllabic nucleus of their correspondent syllables. Usually, a hiatus contains the *i* or *u* between a consonant and a vowel. Here are some examples:

- *di-a-ri* (journal), *Ma-ri-a*, *di-e-ta* (diet), *i-di-o-ma* (language), *e-va-cu-ar* (evacuate), *cru-el-tat* (cruelty), *a-e-ro-port* (airport), *te-a-tre* (theater), *ge-o-gra-fi-a* (geography), *co-a-li-ci-ó* (coalition).

The combinations of the vowels *i* and *u* *with* dieresis are also hiatus. Some examples are *ve-ï-na* (neighbor), *ca-fe-ï-na* (cafein), and *pe-ü.c.* (bootee). Also, there is a hiatus when *i* and *u* belong to tonic syllables and carry a tilde as in *Llu-ís*, *con-du-ís*, and *a-gra-í-em*.

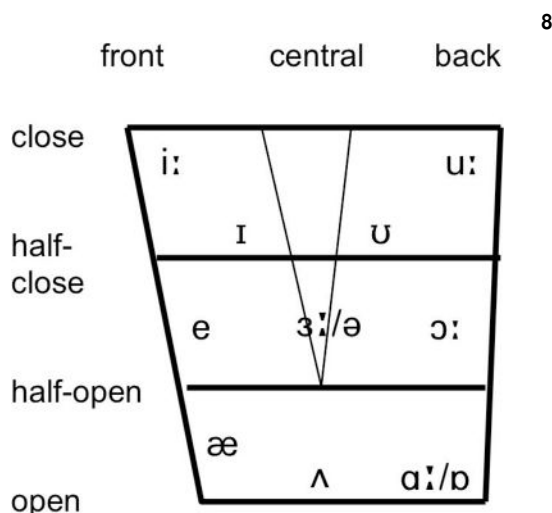
3.2. English

This section briefly describes the whole inventory of the English vowels, and subsequently, focusses particularly on the English schwa, the main topic of this work.

3.2.1. English vowels

Quadrilateral Vowel

In English, there are 12 monophthongs, which are vowels that have a single perceived auditory quality and are commonly represented in the vowel quadrilateral⁷.



3.2.2. English short vowels⁹

The English 7 short vowels are the following:

- /ɪ/: Centralized, fairly front and close unrounded vowel¹⁰. Examples: /bn/, /fi/
- /e/: It is a front vowel. The lips are slightly spread. Ex: /men/, /bet/
- /æ/: fairly open front unrounded vowel. Ex: /mæn/, /kæt/
- /ʌ/: open-mid back unrounded vowel. Ex: /kʌt/, /kʌm/
- /ɒ/: Between open-mid and open. Lips slightly rounded. Ex: /gɒt/, /ðɒŋ/
- /ɔ/: fairly back fairly close rounded vowel. Ex: /pɒl/, /pɒt/
- /ə/: “schwa”, mid central unrounded vowel. Ex: /əbaʊt/, /ə'gri/, /'deɪtə/

⁷ The **vowel quadrilateral** is a graphic representation of the position of the tongue in the articulation of vowels. The two dimensions of the vowel quadrilateral chart the front-to-back part of the tongue in relation to the height of the tongue, with its shape mirroring the range of positions which the tongue can assume. English vowels fall between /i:/ in high front position and /ɑ:/ in low back position.

⁸ Image obtained from the notes of the subject *Pronunciación de la lengua inglesa*.

⁹ The information about the vowel features has been extracted from the subject *Variaciones fonético fonológicas*.

¹⁰ The terms *rounded* and *unrounded* refer to the position of the lips. Thus, in *rounded vowels*, the lips have a round position, such for the production of the /u/. On the other hand, in *unrounded vowels*, the lips are not rounded and can be in a neutral position with no movement as for the production of the English /ə/, or they can be spread with a slight smile, as for the production of the English /i/. (Notes from the subject *Pronunciación de la lengua inglesa*).

3.2.3. English long vowels

The length of English vowels changes depending on the type of sound that follows the vowel, and also the presence or absence of stress has an impact on the length of the vowel. Thus, in English, the following five vowels tend to be long:

- /i:/: close front unrounded vowel. Ex: /pi:s/, /mi:n/.
- /ɜ:/: open mid-central unrounded vowel. Ex: /bɜ:d/, /pɜ:s/.
- /ɑ:/: open back unrounded vowel. Ex: /kɑ(r)/, /hɑ: /hɑ:f/.
- /ɔ:/: open-mid back rounded vowel. Ex: /hɔ:s/, /fɔ:s/.
- /u:/: close back rounded vowel. Ex: /fud/, /'lu:zə/

These 5 long vowels are also different in quality from the 7 short ones. Thus, if similar pairs of long and short vowels are compared, such as /i/ and /ɪ/, /u/ and /ʊ/, or /ɑ/ with /æ/, it is possible to notice differences in quality as well as in length. Nevertheless, Peter Roach, in his book *English Phonetics and Phonology* (2009: p. 16), states that “perhaps the only case where a long and a short vowel are closely similar in quality is that of /ɔ/ and /ɜ/. Hence, taking this fact into account, it is feasible to think that, not only the Majorcan *e neutra* in non-stressed position has a great similarity to the unstressed English schwa, but also the Majorcan *e neutra* in stressed position has a similar correspondence in length and quality to the long vowel /ɜ/. In this work, the majority of examples regarding the production of the schwa are based on the Majorcan variety of Catalan, since Majorcan is a dialect which shows a great use of this sound. Moreover, the practical approach of this paper will be carried on in a Majorcan *EOI* and the students and teachers that will participate on the activity will be Majorcan.

3.2.4. Strong and weak vowels

Strong vowels are those which mainly occur in stressed syllables, even though in some cases they can appear in unstressed syllables. On the contrary, weak vowels are those that can only occur in unstressed syllables.

3.2.5. Diphthongs and Triphthongs

Diphthongs are sounds that involve a movement from one vowel to another in which the first part of the diphthong is larger and stronger than the second one. When producing a diphthong, vowels change in quality and, consequently, have two qualities. In English, there are 8 diphthongs which can be divided into closing diphthongs or centring diphthongs. Closing diphthongs move from a more open position to a closer one and are the following: /aɪ/, /eɪ/, /ɔɪ/, /aʊ/ and

/əʊ/. Centring diphthongs move from a more external position and are /ɪə/, /eə/, and /ʊə/.

As for triphthongs, they are composed of the closing diphthongs followed by the schwa, resulting in the following combinations: /aɪə/, /eɪə/,

/ɔɪə/, /aʊə/ and /əʊə/.

Since the configuration of the closing diphthongs and the triphthongs involve the use of the schwa, it is also possible to find similar combinations in Catalan which keep the same /ə/ sound in the formation of Catalan diphthongs. In Catalan, it is possible to find a similar configuration of sounds in the following *diftongs creixents*¹¹: *qüe*, *güe*, and when *i* and *u* are between vowels. Concerning the transcription of the following words, in Catalan, /j/ and /w/ are semivowels that have vocalic features but present a superior constriction than vowels¹². Some examples would be the following:

- *qüe*: *qüestió* (question) /kwəstió/
- *güe*: *aigua* (water) /ájɣwə/
- *oia*: *noia* (girl) /nóɣə/
- *eia*: *deia* (he said) /dɛɣə/
- *eue*: *veuen* (They see) /vəwən/

Thus, if the examples above are observed, the last sound of each of the diphthongs corresponds to the schwa vowel. It is also possible to find English

¹¹ http://aplicacions.llengua.gencat.cat/itineraris-aprenentatge/suficiencia/sc1/sc152/sc152_03.htm

¹² Lloret, M.-R. (2011). *La fonologia del català*. Barcelona: Santillana. Consultat a http://www.ub.edu/GEVAD/wp-content/files_mf/1335261573340295_Fonologia1.pdf

words that use these same combinations of sounds. The following board compares the above Catalan words with English words that show the same vowel dispositions.

Catalan	English
questió /kwəstió/	tour /tʊə(r)/, lure /lʊə(r)/
noia /nójə/	weird /wɪəd/, fierce /fɪəs/
deia /dəjə/	player, /'pleɪə(r)/
veuen /vəwən/	slower /sləʊ/

3.2.6. English Schwa

The schwa vowel /ə/ is the most frequently used weak vowel in English and it occurs in unstressed syllables. It is mid in quality (between close and open), and central (between front and back), as can be seen in the quadrilateral vowel presented in the section 3.2.1 of this paper. It is described as lax, that is to say, not articulated with much energy. (Roach: 2009, p. 65).

In English, the only case in which it is possible to find a schwa in a stressed syllable is when this vowel is part of a diphthong or a triphthong. Some examples would be the following: chair /tʃeə(r)/, cheer /tʃɪə(r)/, sure /ʃʊə(r)/, fire /faɪə(r)/, flour /'flaʊə(r)/, fuel /'fjuəl/.

English schwa is produced with a narrow opening of the mouth. In her book *Teach yourself English pronunciation*, Eva Estebas states that “it is the sound that requires less effort in production since, apart from the slight mouth opening, no other articulatory movement is required”. Taking this into account, it is feasible to think that this effortless realization of the sound will be relevant to determine the stressed time nature of the English language, since the schwa sound will allow the amount of time between accented syllables to reduce in natural speech. Also, Estebas gives some tips to accurately produce the schwa. She tells us that the /ə/ is similar in quality to the /ɜ/ vowel, but much shorter; and also, compares the schwa sound with that of the Catalan *e neutra* that can be found in words, such as *hola* (hello) or *mare*. Similarly, this neutral /ə/ sound

at the ending of the English diphthongs /ɪə/, /eə/, and /ʊə/ and the 5 English triphthongs (/aɪə/, /eɪə/, /ɔɪə/, /aʊə/ and /əʊə/) is also produced with almost no movement of the articulators, apart from a narrow opening of the mouth. According to Estebas, “the main problem that Spanish speakers find in the production of these triphthongs is the final sound, that is the /ə/ vowel, which is usually pronounced as /a/ (as in *loyal*) or /e/ (as in *tower*) followed by the Spanish /r/ when the *r* is present in the spelling”. The same problem for Spanish speakers applies to the English diphthongs that end in the /e/ sound. Nevertheless, Majorcan learners of English as a SL, should not have this problem since the *e neutra* (schwa) is also part of their inventory. Thus, Majorcan learners of English should be aware of this similarity between both sounds and take advantage of it when learning English pronunciation. As has already been stated, the schwa is a very recurrent phoneme and also plays a major role at a supra-segmental level. Thus, being able to identify it and produce it can make a big difference for Majorcan speakers that learn English. However, not all Catalan varieties have this *e neutra* sound. The empirical section of this present paper will evaluate the perception and production of the schwa on behalf of Majorcan speakers who learn English. The Catalan *e neutra* will be taken as their major reference in order to perceive this sound and produce it more accurately.

3.3. Similar correspondences between English and Catalan vowels¹³

This section gives some examples between the English short and long vowels and the Catalan vowels.

- /i:/ and /ɪ/: The long vowel /i:/ is more similar to the Catalan /i/; however, the English short vowel /ɪ/ is more centralized and has to be produced in a more relaxed way.
- /e/ and /æ/: English /e/ is practically identical to the Spanish one. However, the English /æ/ is more open than the Catalan /e/. The

¹³ The information from this section has been extracted from the book *Fonètica aplicada catalana* de Joan Julià-Muné (2005). According to the author of the book, his examples are based on studies of Gibson (1994) and Wells (2005).

Majorcan variety of Catalan uses a far more open /e/, and, consequently, the pronunciation of this Majorcan /e/ is closer to the English /æ/.

- /ʌ/ and /ɑ/: English /ʌ/ is between the Catalan *e neutra* /ə/ and the English /ɑ:/.
- /ɒ/ and /ɔ/: English /ɒ/ is almost as close as the Catalan /o/. On the contrary, the English /ɔ/ is much more open than the Catalan one and is more similar to the Majorcan variety of Catalan, which also displays a more open disposition in this vowel.
- /u/ and /ʊ/: English /u/ is more similar to the Catalan /u/, but English /ʊ/ is more centralized.
- /ɜ/ and /ə/: English /ɜ/ is similar to the Catalan *e neutra* in strong syllables, and the English /ə/ is close to the Catalan *e neutra* in weak syllable.

In the following board, some English minimal pairs¹⁴ are given to compare these English vowels with Catalan words in order to highlight the sounds that are similar in both languages.

English Vowels	English Minimal pairs	Approximate Catalan Vowel sounds
/i:/	seen /sin/	Fill (son) /fíʎ/
/ɪ/	sin /sɪn/	
/e/	bed /bed/	home (man) /óme/ paper (paper) /pəpé/
/æ/	bad /bæd/	café (coffe) kəfé
/ʌ/	Cup /kʌp/	cap (head) /cáp/

¹⁴ A *minimal pair* is a pair of words which have the same sounds except for one. If this sound causes a difference in meaning (semantic difference), it is a phoneme, and if it does not, it is an allophone which is a possible realization of a given phoneme. (Information from the notes of *Pronunciación de la lengua inglesa*).

/ɑ:/	Carp /kɑ:p/	
/ɔ:/	Cord /kɔ:d/	Bossa (bag) /bósə/
/ɒ/	Cod /kɒd/	corda (rope) /kóðə/
/u:/	Fool /fu:l/	full (sheet) /fúl/
/ʊ/	Full //fʊl/	
/ɜ:/	Fur /fɜ:(r)/	jaqueta (jacket) /ʒəkétə/
/ə/:	For /fə(r)/	la Definit article (the) /lə/

The pronunciation given of the word *home* (man) corresponds to the Valencian variety of Catalan. The Valencian pronunciation of the /e/ is identical to the Spanish one. However, this same word in the Balearic Islands would be pronounced as /ó mə/, that is to say, with a schwa vowel in the weak syllable. For the word *paper* /pəpé/, this pronunciation corresponds to the Majorcan variety. The realization of the /é/ sound is identical to the Spanish *e*. It can be observed that this word has also a schwa in the first weak syllable. However, the second strong syllable displays an *e tancada* and carries more prominence. Also, the written word has a tilde (swung dash) to indicate the way in which the word should be pronounced. Similar words containing this English /e/ sound would be *manera* (way) /mánéɾə/, *carrera* (race) /kəréɾə/, *temps* (time) /téms/, *adéu* (goodbye) /əðéu/.

Regarding the word *café* /kəfé/, the pronunciation of this /é/ would be close to the English /æ/. This sound corresponds to the Catalan *e oberta* and it is also very typical in Majorca. Similar words containing this *e oberta* would be *esquerra* (left) /əscéɾə/, *govern* (government) /góvɛn/, *terra* (land) /tɛɾə/, *biblioteca* (library) /bibliotɛcə/.

Also, the /ɒ/ vowel of the word *corda* /kóðə/ is the Catalan *o oberta* and is very similar to the English /ɒ/. It is also very common in Majorca. Similar words containing this *o oberta* would be *però* (but) /pəó/, *resposta* (answer) /rəspóstə/, *boira* (fog) /bóɾə/, *albercoc* (apricot) /əwβəɾkɔs/.

In relation to the word *jaqueta* /ʒəká tə/, it is important to notice that this 'ə' sound corresponds to the Catalan *e neutra* in stressed position. The phonetic transcription provided corresponds to the Majorcan dialect in which it is also possible to find it in a strong syllable, even though its appearance is much more frequent in weak syllables. Similar words containing this *e neutra* in stressed position would be *esquena* (back) /əscé nə/, *beure* (to drink) /bə wɪə/, *empresa* (enterprise) /əmpɪə zə/, *creure* (to believe) /kiəwɪə/.

4. English and Catalan schwa at a supra-segmental level

This section will present various features of the /ə/ sound at a supra-segmental level in both languages and establish a comparison between the two languages. Some examples will be given to analyse the implications that the English schwa and Catalan neutral /ə/ have at a sentence level.

4.1. Stress-timed languages¹⁵

Stress timed languages are those which use stress to determine the timing of speech. English is a stress timed language and the weak forms contained in a phrase between one stress and the next one will be responsible to determine the amount of time needed to produce such phrase. On the other hand, there are languages in which each syllable is perceived as having an equal duration. These kinds of languages are called syllable-timed languages. Spanish and Italian belong to this category. (Ashby: 2011, p. 165-66).

Thus, in English stresses take place at regular intervals. Lexical words are the ones which convey the meaning and normally carry the stress in connected speech. Conversely, functional words such as auxiliary verbs, articles, pronouns and prepositions are usually not stressed. When functional words are produced in connected speech, they are pronounced faster and in their weak form with absolutely no stress. Thus, in English stressed syllables are regularly produced at equal time intervals being the *foot* the unit of rhythm. A *foot* begins with a

¹⁵ Some information of this section has been extracted from the notes of the subject *Pronunciación de la lengua inglesa*.

stressed syllable and includes all the subsequent unstressed ones up to the next stressed syllable but without including it. The following *four-foot* sentence¹⁶ is used to exemplify this:

*Jonathan had *seen *elephants in the *jungle.

/dʒɒnəˈθɒn həd ˈsiːn ˈelɪfənts ɪn ðə ˈdʒʌŋɡəl/

The sentence above has four *feet* and each of them has a different number of syllables in it, as can be seen in the following subdivision:

1st foot: /dʒɒnəˈθɒn həd/: 4-syllable foot. 2nd

foot: /siːn/: 1-syllable foot.

3rd foot: /elɪfənts ɪn ðə/. 5-syllable foot. 4th

foot: /dʒʌŋɡəl/: 2-syllable foot.

Thus, in the sentence above, the English language tends to keep the same amount of time between stressed syllables, which implies that a native speaker of English would employ more or less equal time in producing each foot in natural speech. This tendency to keep the same amount of time between feet is called *isochrony*. Also, as Eva Estebas states in her book *Teach yourself English pronunciation*, this phenomenon has implications on syllable duration.

The unstressed syllables can vary in length depending on the number of intervening syllables between stresses. The higher the number of unstressed syllables between stresses, the quicker they are produced and hence the more compressed they are.

(Estebas: 2014, p. 219)

Another noticeable aspect of this example is the great amount of schwa sounds. The functional words (the verb form *had* and the article *the*) are weak forms which use the /ə/. These words are produced with almost no articulatory movement, a feature that allows speakers to pronounce them faster in order to keep the *isochrony* in the sentence.

¹⁶ Example extracted from the notes of the subject *Pronunciación de la lengua inglesa*.

One important detail that Eva Estebas remarks in her book is that “the distinction between syllable-timed languages is sometimes not that clear-cut. [...] The two types of rhythmic patterns (stressed time pattern and syllable time¹⁷ pattern) have to be regarded as tendencies rather than norms”. Thus, keeping this in mind, it is possible to think that a Catalan variety such as Majorcan, in which the presence of the schwa is abundant also shows a pattern which is closer to a stressed time language than a syllable time one.

Let’s take the following Catalan phrase as an example:

En *Jaume és a la *casa d’en *Toni a *Palma. (Jaume is in Toni’s house in Palma).

/ən 'zɑuməs ə lə 'kɑzə dən 'tɔni ə 'pawmə/

As in the above English sentence, there are not the same number of syllables in each foot.

1st foot: ən zɑuməs ə lə: 4-syllable foot. 2nd foot:

kázə dən: 3-syllable foot.

3rd foot: tóni ə: 3-syllable foot. 4th foot:

páwmə: 2-syllable foot.

This sentence begins with an *anacrusis*¹⁸, thus the first syllable /ən/ is a preposition in a weak form and does not belong to any foot. It is important to notice that, just like in English, the functional words *a* (indefinite article), *la* (definite article), and *en* (preposition) contain the schwa vowel. Thus, the syllables that have this neutral sound will be produced faster and, consequently, the amount of time between stressed syllables will tend to be equal (isochrony).

What is remarkable and relevant here is that in both English and Catalan sentences, functional words in connected speech contain a schwa. Since these functional words are mainly responsible for time reduction between stressed

¹⁷ Syllable time languages are those in which syllables (no matter whether they are stressed or unstressed) tend to be produced at equal time intervals. Spanish or French follow this pattern. (*Pronunciación de la lengua inglesa*).

¹⁸ An anacrusis is one or more unstressed syllables that do not belong to any foot. (*Pronunciación de la lengua inglesa*).

syllables, it is feasible to think that in Catalan this schwa sound plays also a role in keeping a tendency of the language towards a more stressed-time one. Nevertheless, since it is true that not all varieties of Catalan have the schwa vowel in their inventory, this work takes as reference the Majorcan dialect in which the schwa sound is majorly employed.

5. Language-transfer or Cross-linguistic influence

Broadly speaking, language-transfer alludes to the influence of one's native language to the acquisition of the L2 language and this influence can be negative or positive.

People that begin to learn new knowledge or skills tend to use their original cognitive structure. This includes their own L1 knowledge and the abstract thinking which has been developed through their L1. This abstract thinking refers to the way in which people process information. Learners use their prior knowledge linked to their own native language to think, analyse, compare and comprehend. Consequently, learners tend to master the new language using the experience gained in the process of learning their native language (Hao Yu, Chi Ren, 2013).

5.1. Negative-transfer or interference

When the influence of one's native language results in mistakes in the acquisition of a new language, it can be said that there is an interference or negative transfer. Consequently, negative transfer causes trouble in mastering a new language. Negative transfer displays itself in different linguistic areas. Regarding phonetics and phonology, L2 language sounds or combinations of sounds that do not exist in one's own native language lead to problems for learners in the acquisition of these sounds. Also, in respect to other linguistic domains, such as morphology and syntax, negative transfer generates errors in the L2. Moreover, negative transfer also affects the area of pragmatics since translational equivalents do not always fit in the target language environment. (Bardovi-Harlig and Sprouse, 2017).

5.2. Positive transfer of facilitation

If the influence of the native language has a positive impact in the acquisition or use of the L2, it can be stated that there is a positive transfer or facilitation. (Bardovi-Harlig and Sprouse, 2017).

Traditionally, negative transfer or interference has received much more attention than positive transfer. One of the reasons for this focus on negative transfer is that interferences are generally more noticeable than positive transfers. Yet, since there are many similarities between languages, these should not be ignored when learning a SL. As Yu states in his article *The positive role of L1 in the Acquisition of a Second Language*, “it is not appropriate to emphasize the obvious negative transfer and overlook the positive part since cross-linguistic similarity which may generate positive transfer is an integral part of the whole cross-linguistic influence set”.

Learners of English as a second language approach the task of the acquisition of the L2 with their own L1 native language resources. It seems clear that as the process of learning a L2 advances, the influence of the L1 decreases. In other words, “the greater the target language development, the smaller the influence of the native language” (Bardovi-Harlig and Sprouse, 2017). Nonetheless, it is possible to think that positive influence in early stages of learning English as a foreign language could result in a faster assimilation and mastering of the SL. Needless to say, this positive influence can occur at several linguistic levels at the same time (vocabulary, syntax, phonetics, etc...). Pronunciation, according to most teachers and researchers, is one of the areas in which there is a significant influence of the native language upon the new target language. Therefore, having in mind the main hypothesis of this paper, raising awareness in native Majorcan learners of English as a SL of the similarities between the English schwa and Catalan *e neutra* could lead to a faster assimilation of the sound and, consequently, to an improvement of its pronunciation in the target language. The practical approach of this paper aims at evaluating this premise at both segmental level (isolated words) and at a supra-segmental level (connected speech).

Moreover, “the most common phenomenon is the affect of pronunciation of foreign language from their native language” (Hao Yu, Chi Ren, 2013). Thus, from a phonological point of view, the similarities between the English schwa and the Catalan *e neutra* could have an effect on Majorcan students since this /ə/ sound is found in the phonetic inventory of both languages. And, consequently, due to this correspondence, it could be considered a positive transfer. Notwithstanding, from a methodological point of view, since the students mainly process the new language through the phonetic parameters and cognitive structure of their native language, it seems crucial for them to become aware of this phenomenon to fully take advantage of it. Thus, the next practical section aims at making noticeable these similarities through several activities specifically designed with the intention to benefit from this particular phonetic positive transfer of the /ə/ sound.

6. Practical approach

The practical section of this paper is based on a specifically designed test that aims at evaluating the perception and production of the English schwa and the Catalan *e neutra*. Native Majorcan students of English of the EOI will voluntarily do the test. The test will be divided into two main parts and then a survey destined to evaluate the methodological functionality resulting from comparing both sounds will be carried out. Also, the teacher who conducts the test will be asked to evaluate the outcome and the response of the students that participate in the task.

6.1. Perception and production of the Schwa

The test is based on the perception and production on the schwa in both languages. The test is taken in the EOI of Mallorca and the Majorcan dialect will be considered as the Catalan dialect of reference.

6.2. Perception test

The perception part will involve the recognition of the schwa sound in isolated words, both in English and Majorcan. Thus, English and Catalan words which

have up to four syllables containing a schwa in both languages will be presented to students. The teacher who carries out the activity is a bilingual teacher of English and Majorcan, and will also do first a little introduction of the schwa sound to the students before starting the activity. The students will be provided with the written words but not with the phonetic transcription, since the main goal of the activity is to be able to recognize the sound by ear. The words and the sentences provided for the activities will be read out loud several times.

1st Activity

The following set of English and Catalan words will be read out loud to the students, and then, they will be asked to mark the stressed syllable of each English and Catalan word and identify the unstressed schwa sounds in each of them. The following words will be used:

ENGLISH			
1 syllable	2 syllables	3 syllables	4 syllables
the /ðə/ (def. art.)	father /'fɑ:ðə(r)/	devotion /di'vəʊj(ə)n/	motivation /məʊtɪ'veɪ(ə)n/

CATALAN			
1 syllable	2 syllables	3 syllables	4 syllables
la /lə/ (def. art.)	pare /páɾ/	caseta /kəzə'tə/	emperador /əmpəɾə'dɔ/

2nd Activity

The students will be asked to match the following set of English words with Catalan words. Both English and Catalan words contain the centring diphthongs (/ɪə/, /eə/, and /ʊə/). Regarding triphthongs, English words containing the triphthongs /aɪə/, /eɪə/, /ɔɪə/, /aʊə/ and /əʊə/ will have to be matched with Catalan words that have a combination of sounds which sound similar to the English triphthongs. The following words will be used:

Diphthongs	ENGLISH	CATALAN
/ɪə/	ear /ɪə(r)/	noia /n'ɔjə/
/eə/	air /eə(r)/	creació /kreəsió/ ¹⁹
/ʊə/	cure /kjʊə(r)/	qüestió /kwəstió/
/aɪə/	fire °	rondalla /rondáɪə/
/ɔjə/	lawyer /'lɔjə(r)/	joia /'ʒɔjə/
/əʊə/	lower /'ləʊə(r)/	deuen /də wən/
/aʊə/	hour /'aʊə(r)/	cauen /kəwən/
/eɪə/	layer /'leɪə(r)/	deien /deien/

3rd Activity

The students will be asked to mark the schwa sounds in the following English and Catalan sentences:

Suprasegmental Level	
English Sentence	Jonathan had seen elephants in the jungle.
Phonetic transcription	/ˈdʒɒnəθən həd 'si:n 'elɛfənts ɪn ðə 'dʒʌŋɡəl/
Catalan Sentence	Jaume és a la casa d'en Toni a Palma
Phonetic transcription	/'ʒauməs ə lə 'kazə dən 'tɔni ə 'pawmə/

6.3. Production test

In this part of the test the students will produce the words and sentences of the perception test, first in Catalan and then in English. They will be voluntarily recorded when doing the test, and some of the recordings will be analysed with the PRAAT²⁰ program in order to reach some objective conclusions. Then, the students will answer a survey destined to evaluate if the identification of the schwa sound in Catalan has helped them to produce the schwa sound in English.

¹⁹ The combination of the vowels /eə/ is not a diphthong in Catalan. However, since it sounds like the English diphthong /eə/, it is worthwhile for the purpose of this activity.

²⁰ <http://www.fon.hum.uva.nl/praat/>

1st Activity

Students will be asked to produce the following set of Catalan and English words:

	Catalan	English
1 syllable	la	the
2 syllables	pare	father
3 syllables	caseta	Devotion
4 syllables	emperador	motivation

	CATALAN	ENGLISH
/ə/	noia	ear
/eə/	creació	air
/ʊə/	qüestió	cure
/aɪə/	rondalla	fire
/ɔɪə/	joia	lawyer
/əʊə/	deuen	lower
/aʊə/	cauen	hour
/eɪə/	deien	layer

2nd Activity

Students will be asked to produce the following Catalan and English sentences:

Suprasegmental Level	
English Sentence	Jonathan had seen elephants in the jungle.
Catalan Sentence	Jaume és a la casa d'en Toni a Palma

Some of the recordings obtained from the students will be analysed with the PRAAT program in order to reach some objective conclusions.

6.4. Survey²¹

A survey will be carried out among the Majorcan students that have participated in the test with the intention of evaluating their level of awareness in the perception and production of the schwa after doing the activities proposed.

The survey consists of the following 4 questions in which the students will be asked to value from 1 to 10 their level of familiarity with the /ə/ sound, and the usefulness of identifying the similarity of the sound in both languages to help them in the production of the English schwa after being aware of this correspondence.

1. Were you familiar with the English schwa and Catalan *e neutra* before doing the activities?
2. Did the perception test of Catalan and English words and sentences help you to identify better the schwa in English?
3. Did the perception test help you to pronounce better the English words and sentences given?
4. Value the usefulness of identifying the *e neutra* in Catalan in the perception and production of the English schwa.

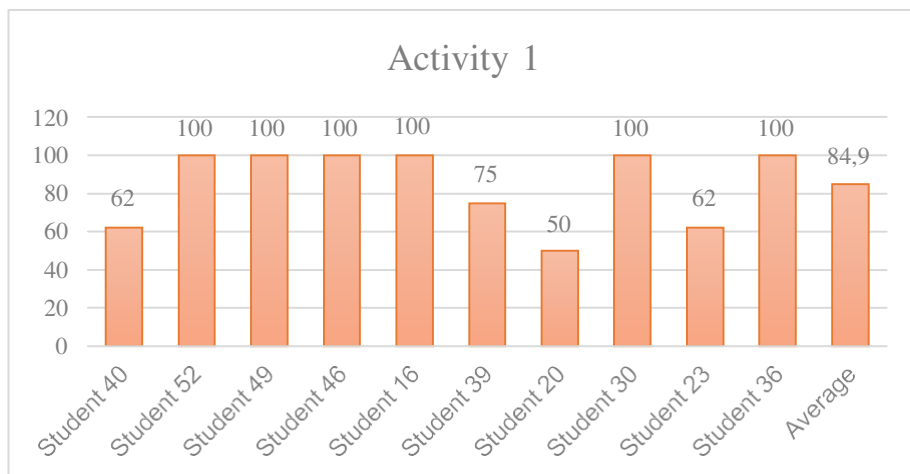
²¹ Anexe 1.9

6.5. Data Analysis

Ten Majorcan native students from the EOI of Palma de Mallorca with ages between 16 and 52 participated voluntarily in the test. The following tables show the statistics derived from the results obtained.

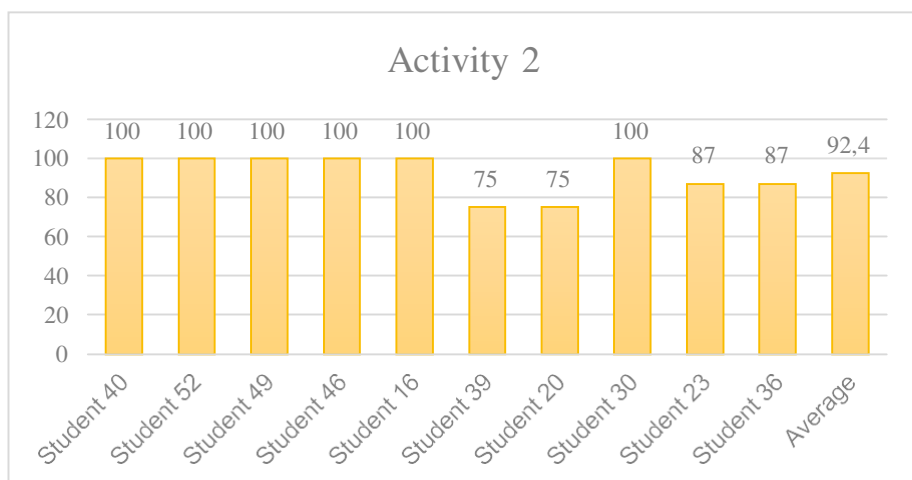
Perception test

Activity 1



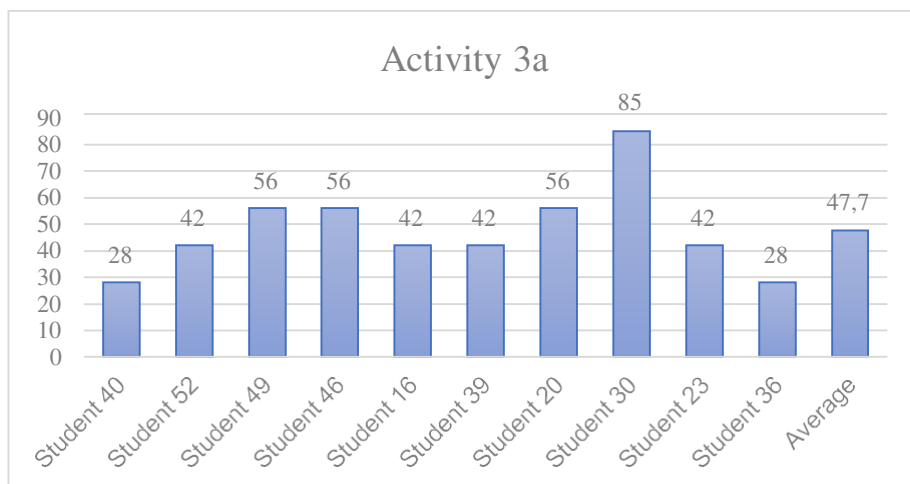
Regarding the 1st activity, 6 of the students got all the answers right, and the other 4 got between a 50% and a 75% of the answers right. Thus, it can be concluded that their general level of awareness in the perception of the sound in isolated words is remarkably high in both languages.

Activity 2



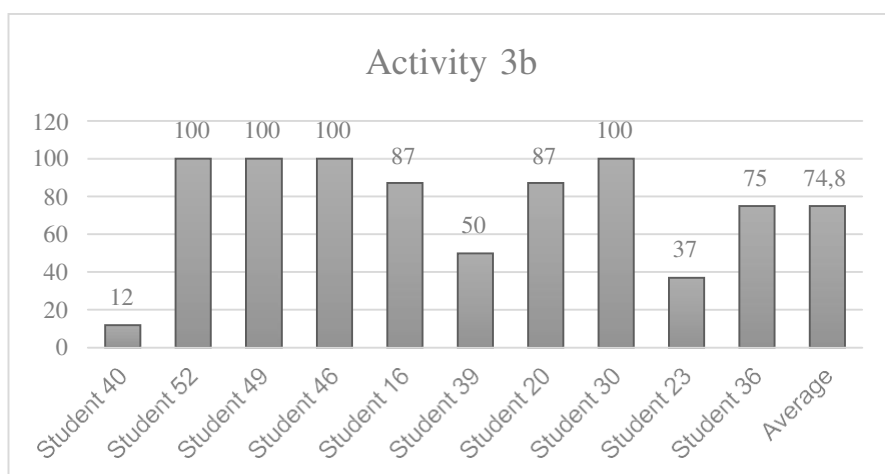
With respect to the 2nd activity, 6 of the students got all the answers right, and the other 4 students got between a 75 and an 87% of the answers right. Hence, all the students performed quite well when matching the Catalan *e neutra* with the English schwa.

Activity 3a



In relation to the activity 3a which refers to the identification of the English schwa in connected speech, the percentage of right answers moves from 28% to 85%. Two students got a 28% of the answers right, four students got a 42%, 3 students got a 56% and only one student scored an 85%. Consequently, it can be stated that when it comes to the identification of the English schwa in connected speech, the students had significantly more trouble in the detection of the sound than in isolated words.

Activity 3b



Nevertheless, regarding the activity 3b which refers to the identification of the Catalan *e neutra* in connected speech, students had less trouble identifying the sound than in English. Four of the students identified a 100% of the *e neutres* in connected speech, and the rest of them got between a 12% and an 87% of the answers right.

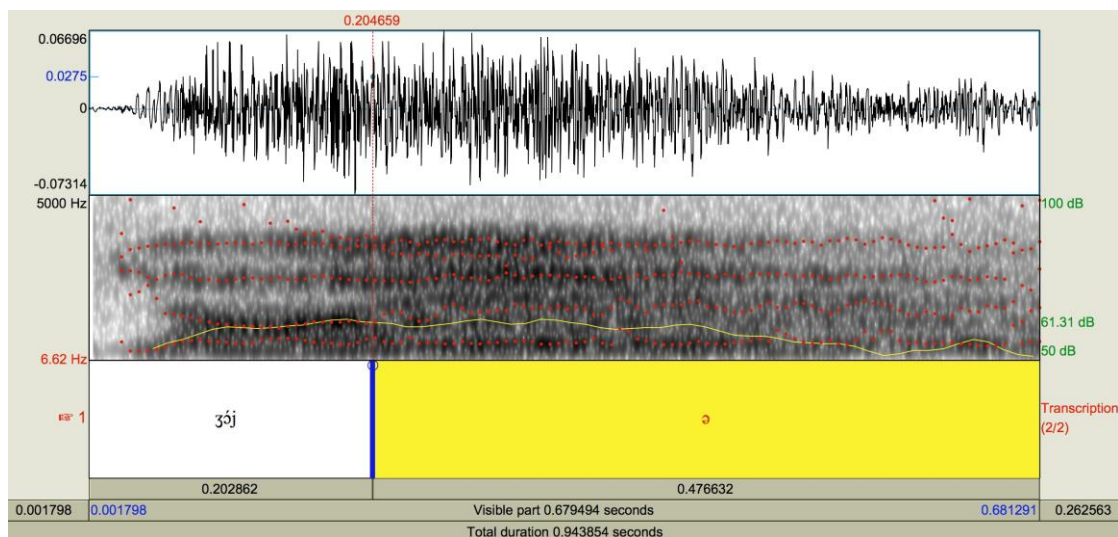
Production test

Four of the students that participated in the perception test took part voluntarily in the recording of the production test. The recordings have been done using a Mac laptop and the Praat program. The students who participated in the production test are 16, 20, 39 and 49 years old.

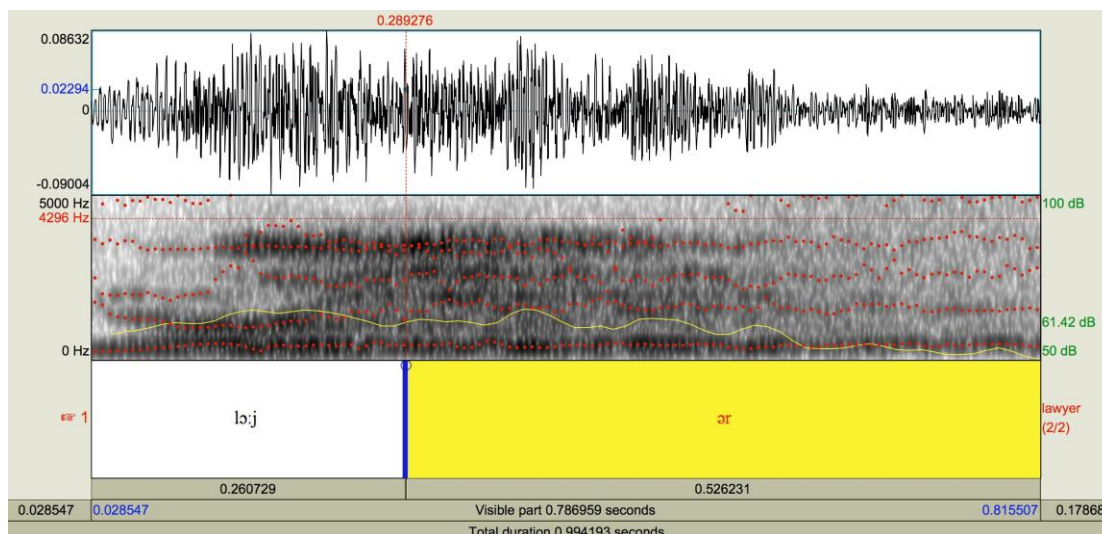
Activity 1

The following two images show the spectrograms of the Catalan word *joia* /ʒó jə/ and the English word *lawyer* /lɔːjə(r)/ uttered by a twenty-year-old male native Majorcan student of intermediate 2 level of English at the EOI of Palma.

Spectrogram of the Catalan word: joia /ʒó jə/



Spectrogram of the English word lawyer /'lɔ:jə(r)/



In both images, it can be appreciated the point in which the transition towards the schwa sound is done. The narrowest point between the first and second formants marks the transition from the sound // towards the schwa sound /ə/. After that point, there is a curve upwards at the second formant in both cases, which indicates the beginning of the production of the schwa sound. Thus, at the beginning of the production of the /ə/ sound, the formant values of both words have been measured and the following results have been obtained:

Catalan word <i>joia</i>		English word lawyer
Time	0.221823	0.303636
Formant 1	519.208129	452.153937
Formant 2	1473.826921	1496.733603

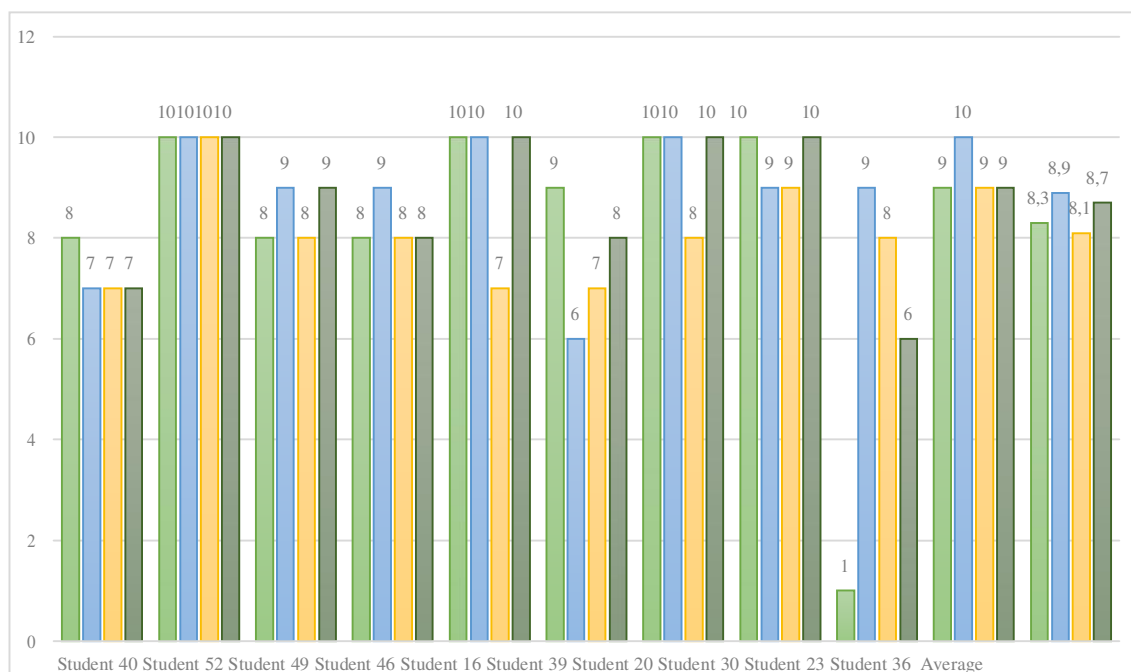
Thus, taking into account this data analysis, the formant values are very similar in both cases, which signifies that the production of the schwa sound is the same in both languages.

Activity 2

In this activity, students were asked to pronounce the English and Catalan sentences proposed. The four students pronounced all the *e neutres* of the Catalan sentence accurately, but failed when pronouncing most of the schwas

in the English sentence which means that when it comes to the production of the schwa in connected speech students had significantly more trouble than producing the sound in isolated words.

Survey



As for the scores obtained in the first question (green line), it can be observed that most of the students were already familiar with the sound /e/ before performing the task. Also, most of them gave values between 9 and 10 to the 2nd question of the survey (blue line). Thus, the students considered that the perception test helped them in the identification of the sound. Regarding the question 3a (yellow line), related to the advantage of previously identifying the sound before producing it, the scores obtained range from 7 to 10, which means that students believed that it is useful to be aware of the correspondence of the sound between languages in order to produce it more accurately in English. Moreover, the scores obtained in question 3b, which range from 6 to 10, reveal that the students valued positively the recognition of the Catalan /e/ *neutra* in order to better identify and pronounce the English schwa.

7. Conclusions

Based on the theoretical research that has been done, it is evident that there exists a similitude in quality between the English schwa and the Catalan *e neutra* as stated by relevant authors such as Estebas, Coe, Wheeler and Muné.

During the process of research, it has been noticed that a correspondence of the English schwa with the Catalan *e neutra* could also be found in diphthongs and triphthongs, and consequently, these combinations of sounds have also been used in the practical approach to elaborate the perception and production activities.

One important fact to highlight is that not all varieties of Catalan share this /ə/ sound. The Majorcan dialect, apart from having the *e neutra* as part of its vowel inventory, also has the peculiarity that this sound can be found in stressed and non-stressed positions, a fact that implies a great recurrence of the sound. This is one of the main reasons why the practical approach of this work has been addressed to native Majorcan students of ESL, since they are supposedly more familiarized with this sound.

Moreover, the schwa sound also plays a major role in determining the nature of a stress-timed language. Thus, it is feasible to think that the Majorcan dialect, which displays a great recurrence of the *e neutra*, could also show a more marked tendency towards a stress-timed language such as English than towards a syllable-timed language such as Spanish. Nevertheless, the demonstration of this premise is beyond the scope of this paper.

The practical approach of this work has been a little experimental study that aimed at finding some evidence of the correspondence of the English schwa and the Catalan *e neutra*. Nevertheless, not all the students that did the perception test participated in the production test. Some of them were reluctant to be recorded. Also, the conditions in which the recordings were done were not the best ones since there was a considerable amount of reverb in the classroom that affected the quality of the recordings. At the same time, the

survey had the purpose of reflecting the students' impressions in relation to this correspondence. The following lines show the conclusions reached after collecting the data from the tests and the survey.

The first activity of the perception test with an 84.9% of the answers right revealed that most of the students were able to identify the schwa sound in Catalan and English and also determine the accented syllables in both languages. The students also got 92.4% of the answers right in the second activity of the perception test which involved the matching of English words containing the schwa with Catalan words including the neutral /ə/. These results show a good level of awareness concerning the perception of this sound in isolated words and a good recognition of the stressed and unstressed syllables in both languages. Nonetheless, regarding the activities 3a and 3b which refer to the identification of the /ə/ in connected speech, the results were considerably lower in English, with a 47.7% of the answers right, than in Catalan with an 84.4% of the answers right. This difference in percentages implies that even though native Majorcan students were able to identify quite accurately the /ə/ sound at sentence level in Catalan, they had considerably more difficulties in the case of English.

Furthermore, the data obtained from the 4 students who performed the first activity of the production test, which involves the production of the schwa in isolated Catalan and English words, show a coincidence of the sound most of the times. This implies that there is a positive transfer from Catalan to English concerning the production of the schwa. Nevertheless, students had more problems when they had to pronounce the schwas in connected speech at sentence level in English than in Catalan, since they failed at producing the schwa in English on many occasions. These results coincide with the perception test which also shows lower percentages when it comes to perceiving the schwa sound at sentence level in English but not in Catalan.

The results obtained in the survey revealed that the students considered that the identification of the schwa in both languages helped them to achieve a better production of the sound in English.

To conclude, after having done the theoretical research, the experimental tests and the survey, it can be said that it is useful to take advantage of the phonological positive transfer of the Catalan *e neutra* when it comes to perceiving and producing the English schwa. This work can constitute a starting point to elaborate classroom activities specifically designed for Majorcan students of ESL with the purpose of achieving a better perception and production of the English schwa.

Bibliography

Alba Juez, Laura, and J. Lachlan Mackenzie. *Pragmatics: Cognition, Context and Culture*. UNED, 2015.

Ashby, Patricia. *Understanding Phonetics*. Hodder Education, 2011.

Atles Interactiu de l'entonació Del Català. <http://prosodia.upf.edu/atlesentonacio/index-english.html>. Accessed 12 Dec.

2017.

Bardovi-Harlig, Kathleen, and Rex A. Sprouse. 'Negative Versus Positive Transfer'.

The TESOL Encyclopedia of English Language Teaching, edited by John I. Liantas et al., John Wiley & Sons, Inc., 2017, pp. 1–6. *Crossref*, doi:[10.1002/9781118784235.eelt0084](https://doi.org/10.1002/9781118784235.eelt0084).

Chacón Beltrán, Rubén. *Sociolinguistics*. Universidad Nacional de Educación a Distancia, 2015.

Diccionari Català-Valencià-Balear. <http://dcvb.iecat.net/>. Accessed 14 May 2018.

Estebas Vilaplana, Eva. *Teach Yourself English Pronunciation: An Interactive Course for Spanish Speakers*. Universidad Nacional de Educación a Distancia, 2014.

‘International Phonetic Alphabet | Definition, Uses, & Chart’. *Encyclopedia Britannica*,
<https://www.britannica.com/topic/International-Phonetic-Alphabet>.

Accessed 15 Apr. 2018.

IPA.

https://www.internationalphoneticassociation.org/sites/default/files/IPA_Kiel_2015.pdf. Accessed 15 Apr. 2018.

Itineraris d'aprenentatge. Suficiència. http://aplicacions.llengua.gencat.cat/itineraris-aprenentatge/suficiencia/sc1/sc15/sc152/sc152_03.htm. Accessed 15 Apr. 2018.

Julià i Muné, Joan. *Fonètica Aplicada Catalana: Dels Fonaments a Les Aplicacions de Les Ciències Fonètiques*. 1a ed, Ariel, 2005.

La Descripció Fonètica i Fonològica Del Català: Els Elements Segmentals.
http://liceu.uab.es/~joaquim/phonetics/fon_cat/fonetica_catala_segmental.html.

Accessed 12 Dec. 2017.

La Fonologia Del Català. http://www.ub.edu/GEVAD/wp-content/files_mf/1335261573340295_Fonologia1.pdf. Accessed 15 Apr. 2018.

Ladefoged, Peter, and Keith Johnstone. *A Course in Phonetics*. 6th ed, Wadsworth/Cengage Learning, 2011.

Lodge, K. R. *A Critical Introduction to Phonetics*. Continuum, 2009. MARGARIT, ANNA MARIA RIBAS. *FONÈTICA CATALANA*. p. 28.

Phonology - Case Studies. <https://www.laits.utexas.edu/phonology/catalan/index.html>.

Accessed 12 Dec.

2017.

Praat: Doing Phonetics by Computer. <http://www.fon.hum.uva.nl/praat/>. Accessed 15

Apr. 2018.

Presentació | *Els Sons Del Català*. <http://www.ub.edu/sonscatala/ca>. Accessed 12

Dec. 2017.

Prieto i Vives, Pilar. *Fonètica i Fonologia: Els Sons Del Català*. 1 ed. en llengua catalana, Editorial UOC, 2004.

Prieto, Pilar, et al. 'Phonotactic and Phrasal Properties of Speech Rhythm. Evidence from Catalan, English, and Spanish'. *Speech Communication*, vol. 54, no. 6, July 2012, pp. 681–702. *ScienceDirect*, doi:[10.1016/j.specom.2011.12.001](https://doi.org/10.1016/j.specom.2011.12.001).

Read 'Biographical Memoirs: Volume 84' at NAP.Edu. www.nap.edu, doi:[10.17226/10992](https://doi.org/10.17226/10992). Accessed 15 Apr. 2018.

Reducció Vocàlica i Els Sons Del Català. <http://www.ub.edu/sonscatala/ca/glossari/reduccio-vocalica>. Accessed 15 Apr. 2018.

Roach, Peter. *English Phonetics and Phonology: A Practical Course*. 4th ed, Cambridge University Press, 2009.

Swan, Michael, and Bernard Smith, editors. *Learner English: A Teacher's Guide to Interference and Other Problems*. 2nd ed, Cambridge University Press, 2001.

Wheeler, Max. *The Phonology of Catalan*. Oxford University Press, 2005.

Yu, HAO, and CHI Ren. *The Positive Role of L1 in the Acquisition of a Second Language*. p. 4.

8. ANNEXES

Annex 1

1. Mark the stressed syllable of the following Catalan and English words and identify the schwa sounds in each of them:

- | | |
|---------------|--------------|
| a) The | e) La |
| b) Father | f) Pare |
| c) Devotion | g) Caseta |
| d) Motivation | h) Emperador |

2. Match the following English and Catalan words that contain a similar combination of sounds.

ENGLISH	CATALAN
ear	creació
air	questió
cure	rondalla
fire	noia

lawyer	deuen
lower	cauen
hour	deien
layer	joia

3. Mark the schwa sounds in the following English and Catalan sentences:

- Jonathan had seen elephants in the jungle
- Jaume és a la casa d'en Toni a Palma.

4. Pronounce the following Catalan and English words:

Noia, ear, creació, air, questió, cure, rondalla, fire, joia, lawyer, deuen, lower,cauen, hour, deien, layer.

5. Pronounce the following English and Catalan sentences:

- a) Jonathan had seen elephants in the jungle
- b) Jaume és a la casa d'en Toni a Palma.

6. Score from 1 to 10 the following items:

1. Were you familiar with the English schwa and Catalan *e neutra* before doing the activities?
2. Did the perception test of Catalan and English words and sentences help you to identify better the schwa in English?
3. Did the perception test help you to pronounce better the English words and sentences given?
4. Value the usefulness of identifying the *e neutra* in Catalan in the perception and production of the English schwa.

This work is mainly focussed on the schwa phoneme. It is a critical review of its singularities regarding English and Catalan, and gives account of its use at segmental and supra-segmental levels. Throughout the essay, several instances are given in order to show the similarities between both languages concerning the schwa. The paper is divided into two major parts: a theoretical and a practical approach. The theoretical one is a critical review of several aspects such as vowel reduction and stress timing, among others. The practical approach, which involves a test and a survey, is based on various activities designed specifically to evaluate the perception and production of the schwa among Majorcan learners of English as a Second Language.