Phonological Awareness in Foreign Language Learning: Japanese Learners' Articulatory Accuracy of Spanish Liquids

Doctoral Dissertation

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(外国語学習における音韻意識
--日本人学生のスペイン語の流音の調音精度--)

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PHONOLOGICAL AWARENESS IN FOREIGN LANGUAGE LEARNING: JAPANESE LEARNERS' ARTICULATORY ACCURACY OF SPANISH LIQUIDS

A dissertation submitted to the Faculty of the Graduate School of International Cultural Studies of Tohoku University in partial fulfillment of the requirements for the degree of Doctor of International Cultural Studies in the International Graduate Program in Language Sciences

By

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Doctoral Dissertation Abstract

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Graduate School of International Cultural Studies

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1. Introduction

In Linguistics, Phonological Awareness (PA) is a person's sensitivity to the structure of sounds in oral language (Anthony & Francis, 2005); however, in the field of Foreign Language Education (FLE), PA is an instructional approach, especially for young kids, that accompany the students in their path of learning how to read and manipulate segments of speech, including words, syllables, and phonemes (Gillon, 2004); normally at the stage of kindergarten or at the first years of elementary school.

Unfortunately, the terms *phonological awareness*, *phonetic awareness*, *phonemic awareness* and even *phonics* have been used interchangeably during the history of oral linguistic research. Phonological awareness is a broader term including all the other terms and it can be defined depending of the phonological level it is being analyzed. Bernhardt and Stoel-Gammon's model (1994) explains how PA is divided in these levels in relation to its development process: word → syllable → onset-rime → segmental. Furthermore, Phillips *et al.* (2008) and Anthony *et al*. (2003) add a continuum (no-sequential-stage) view to Bernhardt and Stoel-Gammon's model, meaning that students do not need to master a skill of a level before they develop the next level skill, but that they can develop them at the same time.

On the other hand, Phonetic Awareness mainly oversees the articulatory aspect of the speech; whether or not learners are aware of the place and manner of articulation, voicing, lips use, muscular tension, and other specific concerns. Phonemic awareness, relates to how learners segment, blend and manipulate phonemes in order to create and modify word or phrase phonological structures (Gillon, 2004). Finally, phonics is a learning method to help students understand the relationship between phonemes and morphemes through sound patterns in prints, mainly with the purpose of preparing learners to be able to accurately read such patterns (Burns *et al*., 2003).

Japanese and Spanish are certainly two very different languages, in regard to their origin, grammatical structure, lexicon, writing systems, among many other areas. However, at the phonological level, Japanese and Spanish have some similarities (Ueda, 1977), both have 5 vowel sounds, share the same stops, share most of the fricatives, and more. Spanish phonological system has 3 liquid sounds. The rhotic [r] is an alveolar apical voiced trill which is one of the three liquid consonant sounds, very distinctive of Spanish language, that any average Spanish speaker can distinguish; besides the other apical rhotic (tap) [ɾ] and the only lateral [l]. Both Spanish rhotics are only found in contrastive distribution in intervocalic position, while in other word positions they are in complementary distribution; trill [r] prevails in word initial position and in onsets following [n], [l] and [s] segments. On the other hand, Japanese has only one liquid sound, generally uttered as an apico-alveolar tap [ɾ] (Hattori, 1951) and it occurs only in a CV onset structure.

Japanese language does not have distinctive liquid segments, but the Spanish sound inventory has three ([r], [ɾ] and [l]), and despite that there are several allophones of the Japanese liquid [ɺ], they do not trigger any miscommunication in all their possible

deviations. However, it is important that Spanish FLLs are able to identify the importance of these distinctive segments, as it could lead to misunderstanding, as in the case of the following minimal pairs:

***pe<u>l</u>o* [l]** (hair) - ***pe<u>r</u>o* [ɾ]** (but) - ***pe<u>rr</u>o* [r]** (dog)

No tengo ni un pelo (I do not even have a hair)

No tengo ni un pero (I do not even have a 'but' [objection])

No tengo ni un perro (I do not even have a dog)

Furthermore, due to some phonological correspondence in both languages, the three liquid segments had to be considered in this study, in order to be able to contrast the only Japanese liquid segment with the two Spanish ones sharing similar phonological categories and the trill segment which does not share any other category besides its manner of articulation.

2. Objectives

This study intends to increase awareness of the impact that PA training methodology has on the articulatory accuracy of liquid segments, of Japanese students of Spanish as a FL. In order to achieve this, the use of traditional instructional methodology for language learning and PA training (using active learning methodology) will be compared in regard to the phonological accuracy achievement of students.

Furthermore, the traditional PA model (Bernhardt and Stoel-Gammon, 1994) which is used to assess and, into a larger extent, instruct language learners has remained unchanged over the years, mainly due to its relation to the acquisition of reading skills in young kids (Badian, 1998; Smith, Simmons, & Kame'enui, 1998; Shaywitz, 2003). However, some insights will be given in regard to the footpath followed for young

learners versus how certain stages of the model could be skipped in the PA training of young-adult/adults subjects.

Finally, the phonological interferences, within the range of liquid segments, Japanese students struggle with while learning Spanish as a FL will be analyzed and schematize in order to address the phenomena from not only a pedagogical approach but also from a scientific/phonetical perspective, so that it is possible to identify the key areas of phonological improvement students need to focus on and maximize the effort in their FL learning process.

3. Research Questions

Based on the research described in the chapters of this paper, the main research questions were: 1) Do students improve their phonological accuracy of the Spanish liquids in a natural FL environment and without any explicit phonological training? 2) How much could phonological awareness affect the phonological accuracy of FLL after one single PA training intervention? 3) What are the phonological interferences involved in the articulation of the Spanish liquids in the reading process of FL students?

4. Research Hypothesis

The null hypothesis (H0), to be rejected later on in the discussion of this paper, states: Students learn liquid segments in a natural FL environment without any specific phonological training; and the alternative hypothesis (H1), which is the main proposal of this research work, states: Phonological Awareness training can significantly improve phonological accuracy of FLL.

5. Participants

Subjects recruited were 123 Japanese university students (18+ years old) learning Spanish as a Foreign language and being within their first year of language training. From the students recruited 118 were selected; the rest were not included due to several factors . The subjects were divided into two groups: the Control group or GA and the Phonologically Trained group or GB. Each group consisted of 59 students; GA: 27 male and 32 female, and GB: 29 male and 30 female. Both GA and GB were subdivided into two subgroups (GA1, GA2, GB1 and GB2 respectively); each subgroup represented a university Spanish course (i.e. 4 class groups in total).

6. Data Collection

During two terms, the control group (GA) was assessed in multiple ways, which included a number of audio/video recordings, mainly for evaluating students' reading and pronunciation skills. As a matter of confidentiality, all recordings were collected in audio format. Such audios were oral examinations based on a set of given texts studied during their program, where structures, vocabulary and others were previously analyzed in class, so that students were familiar with them at the time of recording. As a result, an actual 7-months span of 12 audio sets per student were analyzed for GA, with a total of 2987 audios of lexical units.

The PA Trained group (GB) was assessed before and after the training session. For assessing students before the training, a similar methodology used for GA was chosen. Later on, the students were trained in a 20-minute theoretical-practical session, where they were phonologically instructed on the Spanish liquid segments [ɾ], [l] and [r]. The session was prepared and carried out using an active learning methodology, with activities such as crowdsourcing, fishbowl and peer reviewing. After the session,

each student had a 5-minute one-to-one interview session with Spanish native speakers, in order to reinforce the content learned in the PA training, using re-modeling, minimal pairs and reading activities. At the end of the interview, after students recognized the studied segments in certain lexical units (words) they were asked to utter and differentiate the contrastive segments: [ɾ], [l] and [r] in some selected lexical units. Finally, students' utterances were analyzed by the direct perception method using a checklist, where some lexical units were selected from the whole set used in the interview session. In total, considering the analysis before and after PA, there were 2063 audios of lexical units analyzed for GB.

7. Phonological Accuracy Analysis

For GA, each audio was analyzed by the direct perception method, supported by a speech analysis software (PRAAT) as recommended by Pearce (2011). This software allows researchers to not only identify sounds more accurately but gives a whole spectrum of phonological information that can be included for further analysis. From the audio sets, 7 lexical units with the target segment [r], 14 for the segment [l], and 13 for the segment [ɾ] were identified; such lexical units had different utterance distributions varying from 1-4 times per unit.

For GB, audio samples containing the segment [r] were selected from the pool of oral examinations available previous to the PA training, and underwent a similar analysis than the samples analyzed for GA. Different lexical units (4-5) were assessed for both groups for each of the target segments (with different utterance distributions, varying from 1-3 times per unit), this was because the assessment texts varied in GB1 and GB2. For the interview session (post training), five lexical units were selected from the sample, all of them were previously reviewed by students during the course of the

term subject and had equal distribution and frequency per student. Checklists were used to determine articulatory accuracy per student and per group.

8. Phonological Interferences Analysis

Even though, most of the recording were analyzed with the direct perception method, the speech analysis through PRAAT helped to precisely identify all the segmental categories through spectrograms, whether they came from the target segment or some phonological interferences. Also, at least 10% of the audios were randomly chosen to undergo this analysis to verify the accuracy of the direct perception method. After analyzing all the recordings, the interferences found were organized in three groups: segmental (L1 segment is transferred directly into L2), allophonic (certain features of the L1 closest segment are transferred into L2 as another segment in the L2 phonological inventory) and others (mainly coming from a pre-existing L2). Within these three groups, four main interferences were found: [ɺ] which is the main Japanese segment, [ɾ] and [l] which come from the Spanish inventory but share certain features with the former, and [ɹ] which was the most frequent and significant interference in this group. The groups and interferences were organized as follows (with their phonological categories): Segmental: [ɺ] : alveolar - lateral - flap; Allophonic: [ɾ] : alveolar - flap , [l] : alveolar - lateral - approximant; Others: [ɹ] : alveolar - approximant, [d]: alveolar - occlusive, [n]: alveolar - nasal.

9. Results

The phonological accuracy rate varied during the 7-month learning span (see Figure 1A, 1B & 1C) for GA, from the first assessment session ($\overline{x}$ = 18.98 for [r] segment; $\overline{x}$ = 46.19 for [l] segment; $\overline{x}$ = 41.36 for [ɾ] segment) to the last ($\overline{x}$ =27.16 for [r] segment; $\overline{x}$ = 29.53 for [l] segment; $\overline{x}$ = 96.43 for [ɾ] segment). Each one of the oral

assessments analyzed was represented with the lexical unit(s) found in the assessment texts. Both subgroups followed a relatively similar progression, independent of the segment, even though GA1 performed slightly better than GA2 only for segment [r]; however, considering their final accuracy rates for all segments, such small differences had no statistical significance between both subgroups ([r]: $p = 0.918$; [l]: $p = 0.400$; [ɾ]: $p = 0.115$).

GB was measured similarly to GA in terms of phonological accuracy before PA training and the rates were considered as the initial individual achievement; moreover, the results after the PA training were added as the final individual achievement. As expected, the general phonological accuracy rates, as well as the individual achievement rates, increased significantly after the PA training.

From the results, it was possible to notice how significant the impact of PA training was when comparing GA and GB's accuracy means. Although both groups started in a very similar articulatory rate, the line progression of phonological articulatory improvement of the target segment is consistent with the results found, considering that there was only a single PA intervention during the process. Therefore, comparing the accuracy improvement means, at least for the segments [r] and [l], and considering the liquid segments as a whole learning set, the null hypothesis of phonological improvement in a natural FL environment during the learning process is rejected ($p < 0.001$), proving that phonological training needs to be included within the FL learning span.

GA vs GB phonological accuracy rates

Segm	Subgroup	General Achievement Mean		Initial Individual Achievement			Final Individual Achievement		
		Initial	Final	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)
[r]	GA	18.98	27.16	7.69	38.46	53.85	0.00	69.49	30.51
	GB	14.58	72.54	5.08	33.90	61.02	66.10	11.87	22.03
[l]	GA	46.29	29.53	8.47	54.24	37.29	0.00	100	0.00
	GB	29.10	100	0.00	77.97	22.03	100	0.00	0.00
[ɾ]	GA	41.36	96.43	28.82	52.54	18.64	10.17	89.83	0.00
	GB	66.22	98.64	18.64	81.36	0.00	96.61	3.39	0.00

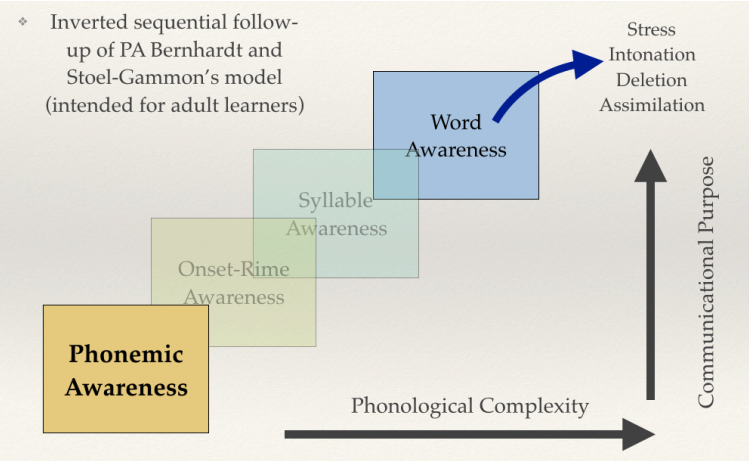
10. Discussion & Conclusions

Based on the results found, there is a high significant relation between PA training and the phonological accuracy performance of learners. The more students are aware of the phonological mechanism of their L1 and target FL, the more their phonological accuracy will improve, as it was possible to notice in the results of this study in regard to the Spanish liquid segments. Moreover, it is necessary more evidence to project this results into long-term phonological accuracy performance, which needs to include other group of segments as well. For it, the design and development of a model that fits these needs has to be implemented in the learners' learning and assessment processes.

Taking into account the impact PA training could have based on this study results, the logic of the phonological acquisition pathway seems to have a greater effect into this age range and satisfy their linguistic needs with an inverted sequential follow-up of Bernhardt and Stoel-Gammon's PA model, which is originally intended to

interpret the development of phonological skills in young learners, in respect of their L1, but that can also be applied to unfold the phonological evolution in acquiring a foreign language. Therefore, taking into account the continuum view (Phillips *et al*., 2008; Anthony *et al*., 2003) of the model, the methodology to be chosen will depend on the learners' phonological needs, rather than an unidirectional pathway, starting to sequentially address the levels in an ascending order, from segmental → onset-rime → syllable → word → syntactical structures, within the methodological planning of the learning process for young adult learners.

Proposal of the Bernhardt and Stoel-Gammon's phonological acquisition model inversion.



In this study, university students were assessed in the FL phonological acquisition of the Spanish liquid segments. Here, it was possible to unveiled how a PA intervention affects students' phonological skills within their first year or language learning. Even though a traditional teaching approach can also contribute in certain extent to the acquisition of sounds, the liquid segments in this case (specifically the [ɾ] segment), it was possible to prove how PA gives students a comprehensive understanding of the articulatory processes of both, the sounds and their phonological contexts, and how it improves the learners' articulatory accuracy by polishing the speakers' utterances to reach a 100% rate in the pronunciation of the target segments.

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CHAPTER I

INTRODUCTION TO PHONOLOGICAL AWARENESS

1.1 Research on Phonological Awareness

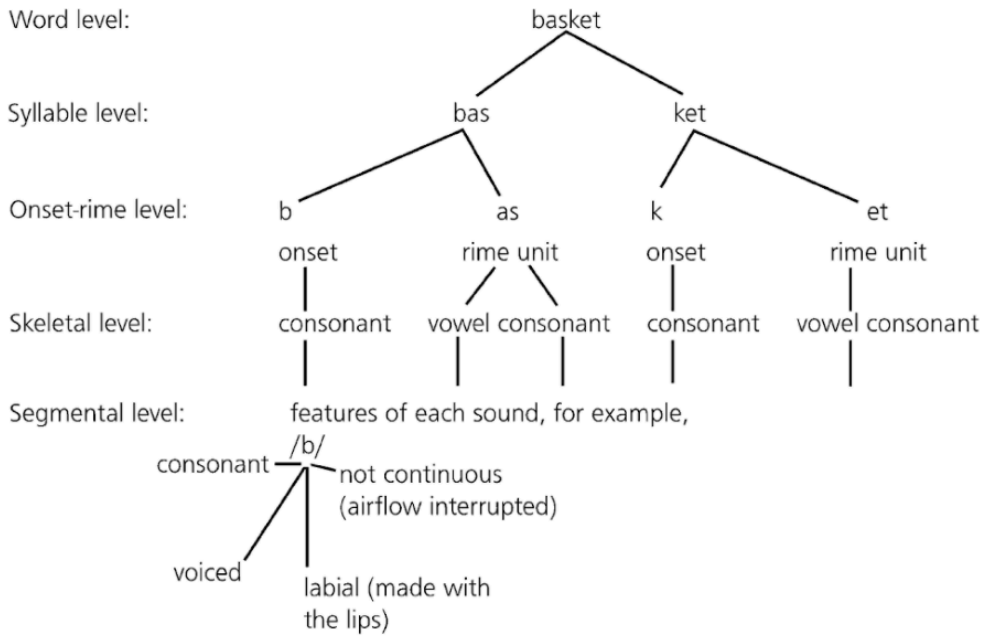
Second Language Acquisition (SLA) processes acknowledge the fact that Second Language Learners (SLLs) will substitute or transfer sounds in order to simplify speech; and use similar sounds from L1 when some sounds from L2 are not present in their phonological system (Crystal, 1987). Thus, phonological interference is defined by Berthold *et al*. (1997) as items used by a foreign language speaker which contain certain elements from their first language, including from single speech sounds (phonemes) to other prosodic features. Furthermore, Trubetskoy (2005), after studying the perceptive operational processes in SLA, added to the equation his well-known "phonological filter" proposal that stands for the speaker's inability to perceive non-native segments, opposed to the solely idea of the articulatory inability in the utterance of a foreign language sound. SLLs will face these phenomena in all their range: the distribution and number of phonemes in the contrastive systems, syllable structure, allophonic variations, prosodic shortening and lengthening, diachronic usage, among others.

Furthermore, Flege's Speech Learning Model (Flege, 1987, 1995) states that SLLs will be more likely to distinguish L1 and L2 sounds when they are less similar in their phonological categories. In this way, SLLs will be able to establish one or some new L2 categories of a given L2 sound only if they can perceive the main differences

with their closest counterpart in their L1; if not, such sound might be assimilated within a single L1 category and therefore interfere in the learning process of the corresponding L2 category (Altmann & Kabak, 2011).

In Linguistics, Phonological Awareness (PA) is a person's sensitivity to the structure of sounds in oral language (Anthony & Francis, 2005); however, in the field of Foreign Language Education (FLE), PA is an instructional approach, especially for young kids, that accompanies the students in their path of learning how to read and manipulate segments of speech, including words, syllables, and phonemes, normally at the stage of kindergarten or at the first years of elementary school. Unfortunately, the terms phonological awareness, phonetic awareness, phonemic awareness and even phonics have been used interchangeably during the history of oral linguistic research and, even though it seems possible to find some more consensus today about them, there is still some ambiguity in their use, especially in the education field, where authors use these terms unorthodoxly.

Phonological awareness is a broader term including all the other terms and it can be defined depending on the phonological level it is being analyzed. Bernhardt and Stoel-Gammon's model (1994) explains how PA is divided in these levels in relation to its development process: word → syllable → onset-rime → segmental. Gillon[1] (2004) explains how each one of those levels works and is acquired during the learning process and schematize the progress in a hierarchical flux from a more complex phonological unit until the most simple ones (i.e. phonemes) and, in a broader extent, their phonological features, such as place of articulation, manner, voicing, and so on.

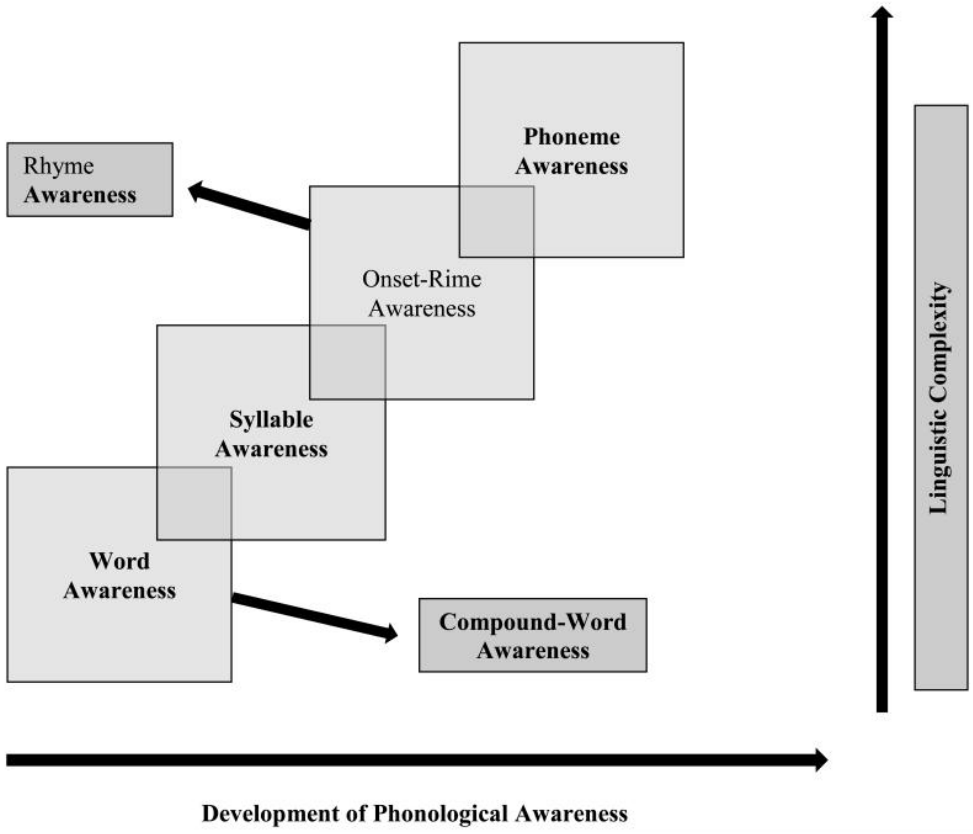


[1] Phonological structure example applying Stoel-Gammon's model (Gillon, 2004)

In this model, the sequence of PA development starts from the word manipulation skills. Learners are able to combine words to form a compound word and divide of delete one lexical unit contained in a compound word in order to utter the remaining unit. Then, it moves to the syllable level, where students are capable of count or divide syllables within a word and to join syllables to form a word. Following these two levels, the onset-rime level comes along; young learners are able to match words that rhyme with each other, recognizing when the coda and/or rime in a syllable matches another one in a different word or grouping words with the same onset and nucleus. Finally the smallest sound units come in; here, students are able to distinguish, associate, manipulated articulate single segments, this level is the one phonemic awareness focuses on.

Furthermore, Phillips *et al.* (2008)[2] and Anthony *et al*. (2003) add a continuum (no-sequential-stage) view to Bernhardt and Stoel-Gammon's model, meaning that students do not need to master a skill of a level before they develop the next level skill, but that they can develop them at the same time. As seen in the the figure below, each one of the levels is overlapped, meaning that it is possible to learn different phonological skills in parallel. It is certain that smaller sound units represent a higher cognitive complexity respect to language, and children naturally acquire this explicit knowledge in later stages in their literacy process. However, this continuum helps us understand that Stoel-Gammon's hierarchy is not applied in terms of learning capability, as students can learn a varied set of phonological skills at the same time, but only in how complex the explicitness of the phonological acquisition of a language is for young learners.

Adding this continuum provides a new aspect to the process, as it shows the opportunity the phonological acquisition could have in foreign language instruction, as the learning flux does not follow a fixed hierarchy pathway but surrounds a dynamic flexibility in the instructional process. Therefore, the linguistic complexity in which each level is addressed is dependent on the learner's (phonological) needs rather than the structural functionality of the language being taught. This developmental aspect of the model enhances the individuality of the learners' strengths and focuses on their weaknesses, so that the instruction time within a classroom could be used more efficiently.



[2] Developmental Continuum of Phonological Awareness model (Phillips *et al*, 2008)

Phonemic awareness, then, relates only to how learners segment, blend and manipulate phonemes in order to create and modify word or phrase phonological structures (Gillon, 2004). Thus, students must learn to isolate these sounds, one from another, and to categorize them in order to understand how words are spelled. It is this explicit, reflective knowledge which is the main focus of development for phonemic awareness. It is a conscious awareness of phonemes, which is different from the intrinsic sensitivity that enhance speech production and reception (Evans, 1998), and, therefore, speech as a whole.

On the other hand, Phonetic Awareness mainly oversees the articulatory aspect of the speech; whether or not learners are aware of the place and manner of articulation, voicing, lips use, muscular tension, and other specific concerns. Phonological rules,

within this area, limit speech-sound production for biological and environmental reasons, which are due to the limitations of the human articulatory-motor production system (Evans, 1998). Other boundaries on human speech ability is related to the way our brains classify and perceive phonemes, the minimal units of sound that make a difference to meaning.

Finally, phonics is a learning method to help students understand the relationship between phonemes and morphemes through sound patterns in prints, mainly with the purpose of preparing learners to be able to accurately read such patterns (Burns *et al*., 2003). However, the latter is a common methodology used in languages with a low degree of grapheme-phoneme correspondence, as it is the case of English, but not of Japanese and Spanish, which have high phonemic orthographies. Moats & Tolman, (2009) argue that PA instruction is usually confused with phonics instruction, when PA instruction only qualifies as phonics instruction when it involves teaching students to blend or segment the sounds in words using letters. Nevertheless, students may be taught to manipulate sounds in speech without any letters as well, and this does not qualify as phonics instruction.

Traditionally, and perhaps because some foreign languages own well defined phonemic orthographies, many language instructors tend to reduce or omit language pronunciation contents in their classes, mainly because they consider it as the least valuable compared to other language skills (Elliot, 1995). This is the reason why learning a foreign language (FL) for young adults has resulted in students being forced

to utter a certain number of foreign sounds without instruction or knowledge about them.

Trubetzkoy (1971) explains how FL learners struggle by trying to deal with such a load of phonological information carrying on a 'phonological filter' from their mother tongue (L1), resulting most of the time in direct phonological transfers from their L1 or in phonological interferences; moreover, depending on which pair of languages the learners go through as L1 and L2 (i.e. FL), the level and complexity of this phonological phenomenon can widely vary in their oral performance. Thus, Dziubalska-Kołaczyk *et al* (2013) emphasize the importance of PA training of a FL, as well as of L1, so that students are able to overcome several pronunciation problems that are likely to become more evident later in their oral performance.

Even if a FL student has phonological awareness skills in their mother tongue, it does not mean they will also be able to transfer such skills to their L2, or if it is the case, to L3 or L4 (Durgunoglu & Onëy, 2002). This has always been an indicator leading to unintelligible speech coming from articulatory inaccuracy and has produced a feeling of frustration and disappointment in both, the FL learner and the interlocutor; therefore, it is recommended to start developing PA skills in students within the first stages of the learning process (Kenworthy, 1987), in order to avoid an eventual counter-productive motivational effect in the learner.

Other definitions of PA differ basically in the phonological awareness skills that are being integrated or excluded. These skills are recognized by the phonological task being addressed and the dimension of the sound unit that is involved within it. Within

the word awareness unit level, for instance, there are two main structures being addressed, syllables or intra-syllabic units; and for the onset-rime unit level, the initial single or cluster consonantal sounds involved and the core vowel and posterior single or cluster consonantal sounds. Therefore, when focusing on the different unit levels it is possible to define, utilize and apply what phonological awareness is into different literacy curriculum and methodology, highlighting the process of phoneme-grapheme (sound-letter) correspondence or rime analogies (Anthony & Francis, 2005).

PA is vital in the process of pronouncing new words, and it is even more important in early stages of L1 phonological acquisition. Treiman (1991) explains how children use different methods in order to achieve such phonological aim; the first one is related to memorized associations between previously learned printed words and their actual pronunciation; and the second is related to uttering (speaking out) the new words by phonologically building them from their graphemic representations. In this way, young learners use their alphabetic knowledge and phonological awareness to decode unknown words.

The method of simply exposing students to an L2, without explicitly teaching them the sounds and how they are different or similar to the sounds of the L1, can cause problems in their understanding as a reader and in their abilities as a writer. This same issue can be found in the methodology of teaching Spanish as a FL. Moreover, Japanese speakers who learn Spanish as a FL need explicit instruction on the Spanish sounds in order to contrast them to the ones in the Japanese system and, therefore, will be able to

properly utter, read and even write the language they are aiming to learn. That is the main function and significance of Phonological Awareness.

Condemarin (1996) highlights that the interest in developing phonological awareness in children is based on numerous studies that demonstrate a positive correlation between the learner's ability to discriminate the elements that make up speech and his or her success in reading and writing. As before mentioned, phonological awareness is a metalinguistic ability, which introduces the learner into the system of speech sounds, through the functions that fulfill the words, rhymes, syllables and phonemes, and their combination, in all the possible phonological levels.

Reading must be taught and practiced, fundamentally, as an act of constructing meanings with a clear purpose for the student. Here, the development of phonological awareness is a complementary process that is of great interest, since it facilitates understanding insofar as it favors fluent reading. Thus, children learn to discriminate the initial and final sounds of words, learn to identify a phoneme with its corresponding grapheme, etc.

The cognitive knowledge of the phoneme is very necessary to understand the alphabetic principles but sometimes such knowledge is not obvious for FL learners, since the processing of oral language requires an implicit knowledge of phonological structure, that is, phonological awareness (Singorini, 1998). As PA is the ability that allows the students to be aware that words are made up of sounds and that these can be graphed, it helps them to realize that the combinations of these spellings form words.

This metalinguistic ability allows people to realize the minimal sound units (phonemes), which constitute the words and enables the realization of a series of voluntary operations, such as altering, varying, substituting, mixing or omitting the phonemes of a word. In other words, it is the ability that makes it possible to recognize, identify, manipulate the sounds that make up words. This awareness is the capacity of recognizing, perceiving and utilizing the phonetic components of oral language and the mastery of various processes that individuals can consciously perform on oral language.

This ability to perceive the relationship between letters and sounds of words has two potential benefits for the FL learner. The first reinforces the individual knowledge of letter-sound (grapheme-phoneme) relationships and the second, helps to reinforce the memorization of the word as a whole, so that they can recognize it accurately when they find it written in future learning.

If there is no good development or stimulation of this skill, the next learning stages will be limited, along with its components. Therefore, it will affect the level of oral phonological awareness and the interaction with written language, a process that is carried out with the help of the teacher, who provides the key concepts to establishing dynamic associations between them.

According to Melby-Lervåg *et al* (2012), phonological awareness has specific areas of development where the first skills that are developed are words and syllables, followed by initial sounds and rhymes, and ending with phonemes. These are: auditory awareness (to become aware of the world of the sounds in which you are immersed); auditory memory (ability to evoke, verbal reproduction and retention); auditory

discrimination (ability to differentiate the same or different sounds); initial sounds (ability to discriminate speech sounds, which should not be presented in isolation, on the contrary, should be within a context of familiar words); final sounds or rhymes (after discriminating the initial sounds, you must exercise the final sounds of the words).

Within these areas, the one that will be aimed more specifically in this study is the phonemic one. Phonemic awareness can be defined as the specific ability to focus on and say phonemes in words expressed orally. That is, phonemic awareness allows a person to hear and repeat the individual sounds that are part of a syllable or a word in a language. Then, the phonics method connects the sounds to the graphemes in different ways in both languages.

1.2. Phonological Awareness in Foreign Language Acquisition

Phonological awareness has been one important core of research in the last decades, in regards to language acquisition and proficiency, and several studies also discuss how phonological awareness could be key for second language acquisition, especially in terms of developing the fundamentals for language literacy (Wagner & Torgeson, 1987). Gerber & Leafstedt (2005) sustain that PA helps and enhance the development of linguistic skills, learners become able to boost their skills in order reach language proficiency. Language instructors with enough phonological awareness training can use the learners' L1 PA skills and knowledge in other to make relations between what the understand and manage with the new phonological system in the target FL, as well as the links with its orthographic system.

Young learners certainly learn languages in a different way than adults do. Phonological awareness knowledge can help instructors achieve the desired linguistic goals in their adult students in a foreign language as well it does with children in their L1 (Marinova-Todd *et al.*, 2000). Even though there are several studies focused on phonological awareness in bilingual students, considering a wide range of languages and phonological systems, there is not enough research in how to harness this phonological knowledge in order to be applied in second language acquisition, and what are the methodological techniques for teachers to use in order to apply such knowledge with older students learning a certain foreign language.

Gerber & Leafstedt (2005) affirm that learning an L2 is much simpler for learners than when they learned their L1, as they could use all their previous linguistic knowledge as a basis for learning a new language. The key elements of phonological awareness have been extensively studied and defined, so that it is possible to understand how PA is used in the development of language skills (Wagner & Torgeson, 1987); therefore, when following the phonological awareness patterns in L1 language acquisition, instructors and researchers could use the same methodological footpath in order to be used effectively in second language learning practices. Gerber & Leafstedt (2005) also found that phonological awareness tasks in paired languages are comparable and there are several correlations that have been significant in the language learning process; hence, proving that PA has a high positive effect on second language acquisition. As this link between PA and FL acquisition can be established, it is possible to find new methodological understanding in language instruction so that students can acquire the necessary phonological skills in a foreign language more effectively.

Independently of which language we focus on, all languages display a sound system, phonological patterns and rules and implement different techniques to develop systems of speech. Considering these elements, that are extensively studied throughout language learning, it is possible to prepare and design the sufficient instruction methods for students to acquire a foreign language, by understanding the similarities and differences of the phonological systems in which an language teaching scenario is set; not leaving behind the similarities that can be found between the orthographic components of the languages involved in the process, if existing.

In that respect, phonological awareness becomes a key component in language training. Several studies pairing languages show that PA skills can be transferred to a foreign language being learned, if they have been acquired during learners' first language acquisition. De Sousa *et al*. (2010) mention that students seem to have greater learning skills in the first levels of a foreign language when they have previous phonological knowledge, and when they are able to identify the correlations between their L1 and their target language in a certain phonological level. Farver *et al*. (2009) also show in their study that PA has a high impact on foreign language acquisition and that FL learners under PA training are able to transfer their phonological skills from their L1 to the target FL, being highly effective at improving outcomes.

The (American) National Education Association (2007) experts found that students learning a new language are more successful if they have PA skills and are able to recognize segments that are shared in both of the languages they are dealing with (L1 and FL) in the learning process, in a way that researchers believe it is possible to predict

how fast students can acquire language skills based on the PA levels they manage. A study performed by Yeung & Chan (2013) showed how PA test results had a strong correlation with reading and spelling skills; students with weak PA experienced slower language acquisition rates and lower outcomes for FL learning. However, there are also some studies suggesting that the correlation between PA and FLA is not always reciprocal, and not all skills can be transferred effectively from L1 to L2, as some skills (including PA skills) can have an impact on different other language skills and do not always facilitate or ease the language learning acquisition process. (Fabiano-Smith & Goldstein, 2010).

As PA demonstrates to be the ability of understanding and manage the basic and fundamental components of a language, it is possible to use this resource as a tool to acquire a FL faster and, therefore this benefit should carry the responsibility to FL instructors to change their teaching practices in order to include and boost PA instruction in their classrooms. The more instructors are aware of the benefits produced by PA instruction, the more programs and school with pride the enough resources to develop methodologies and materials, in order to provide students with the necessary skills for succeeding in their language acquisition plan. In that matter, more research should be carried out to include as many different language systems as possible and the possible correlations among them.

In this last matter, another important aspect of discussion related to PA and FLA is the transference and interference produced when pairing different languages in a learning process. Usually, a given L1 will intrinsically influence the acquisition and production of a L2 (FL) being learned. This transference can have a positive of negative

impact on the learner, depending on how the FL instruction is orientated towards linguistic goals. Interference coming form L1 in the area of phonological acquisition can create several difficulties for learners, such as mispronunciation or misinterpretation and also has an effect of phonological memory, which is key for phonological processing. However, PA knowledge can also be transferred from L1 to a FL. Gerber and Leafstedt (2005) measured PA skills of Spanish (as L1) and English (as FL) students and found that the understanding of the predictive relationship of phonological patterns and decoding between the two languages, linked to the graphemic representation of both language systems, made students improve their phonological skills in their FL.

The more the orthographies of the languages involved are alike, the easier students will be able to transfer their PA skills from L1 to FL. Le Roux *et al*. (2917) found that the success students are capable of transferring their PA skills depends not only on the level PA they might have but also on the particularities of the language systems learners deal with. Even though PA skills development is parallel when comparing alphabetic languages, the rate of development and level of attitude vary. This fluctuation is based on the divergencies in the linguistic features of the languages in question. The simpler the phonological structure of a language, the less capable learners would be, in terms of PA, for transferring their skills into a new language.

1.3 Research input on Phonological Awareness Instruction

Phonological awareness instruction is very important for oral communication; it is also a significant part of the set of the skills to be learned for acquiring

communicative competence. In order to overcome possible communicational problems, FL teachers (Spanish, in this case) should convince their learners that the aim of pronunciation is not to gain a native accent but to help them pronounce correctly enough to be easily and comfortably understood by other speakers (Ur, 1984). According to Harmer (2007), simply knowing where the sounds are produced in the mouth and which syllables are stressed in words improves learners' comprehension and understandability.

When it comes to the instruction of pronunciation, Bueno (2013) emphasizes that it is highly important to decide which is the level of phonetic precision that the learners are to acquire, in order to adapt the required methodology to the objectives. This can guide, narrow down or lead the teaching work, and will be directly proportional to the students' objectives and the aims of the institution in which the learning program is taking place. When carrying out a contrastive analysis and a study of the students' interlanguage, it is necessary to make a forecast of the errors that could be committed, and this will be easier to do if the instructor has the necessary knowledge about the student's L1, since a contrastive analysis has a predictive character and can, therefore, guide the way in how to address the pronunciation problems.

When teaching speech sounds, in a phonemic level, we need to consider both consonants and vowels. Each speech sound is characterized by a group of features, such as frication, nasalization, occlusion, etc. or voiced and unvoiced, or aspirated and unaspirated, and so on. Speech sounds that are similar in place and manner of articulation are the most easily confused (Moats & Tolman, 2009) and, therefore, will

represent a greater effort in differentiating those segments when instructing students. If learners are left on their own to realize what the identity of speech sounds are in every word, they may not be capable of detecting all the features that distinguish certain sound units without explicit instruction. Furthermore, speech sounds are not articulated separately (i.e. in isolation); they are coarticulated in every single word utterance, and thus, considering learners approach to a new language without previous explicit phonological knowledge, even in their L1, many of them will have some difficulty segmenting sounds in other to acquire all the necessary features to discriminate one foreign sound from the other. Direct teaching has been an important methodology over the years because it enables students to form accurate concepts of speech sounds that will attach to their learning of new words and will help to their reading and writing skills (Moats & Tolman, 2009).

One of the difficulties in acquiring phonological awareness is that the sound of any given phoneme can differ significantly, from word to word and speaker to speaker. These variations, which usually do not alter the written norm nor the given meaning of it but only the way they are uttered, includes into the picture an allophonic scene that needs to be consider when teaching certain language variety (Evans, 1998). For example, in the case of Spanish, the pronunciation of the word *pollo* (chicken) can vary from [poʃo], [poʌo], [poʒo], [poʝo] and [pojo], among other varieties, depending of the region in which Spanish is being spoken. Furthermore, phonemes are not isolated sound units that work on their own and can be ultimately learned in isolation, but they are co-articulated and appear in certain structural contexts forming syllabic units. For example

the word *dedal* is not a group of single distinct sounds we utter separately (i.e. /d/, /e/, /d/, /a/, /l/), but the utterance includes the reciprocal influence of the consonant sounds with the vowels and the articulatory effect that it involves (i.e. [deˈðal]).

Moats & Tolman (2009) argue that any type of instruction that could enhance phonological awareness is significant for students who are not aware of the internal phonological details within spoken words, independent of their age. They sustain that a well-designed language lesson must consider, even if small, certain pronunciation item, that involves brief, direct practice of specific phonological skills, such as syllabic structures, phoneme recognition and segmentation, phonological patterns, among others. It is possible to include this item in any section of the lesson, even as a warm-up exercise, that can precede a main activity, such as reading, spelling, vocabulary or conversation practice. Instruction in phonological awareness, as any other component of a language lesson, needs to be engaging, systematic, appropriate to the age of the learners and display a number of possible strategies to develop the necessary phonological skills in the students.

There is a significant reduction and ease in regard to the reading/speaking difficulties when phonological instruction is present within the language learning process, whether it is the learners' first language or a foreign one (NICHD, 2000; Gillon, 2004). Teaching explicitly and directly phonological skills to students helps with the coding learning process of a given language, so that it is recommended that initial language programs (in at least A1 and A2 levels) include this type of instruction in its curriculum

In regard to the phonological levels that need to gather more attention in the phonological instruction, Snider (1995) suggest that working in in less complex phonological levels, such as rhyming or onset and rime may facilitate instruction in more complex skills. He sustains that integrated instruction, in the activities such as segmenting and blending, seems to provide a great benefit to reading acquisition. Blending phonemes into words and segmenting words into phonemes contribute directly to learning to read and spell correctly. Snider (1995) emphasizes that these two phonemic awareness skills provide the biggest contribution to the phonological learning acquisition process than any of the other activities under the phonological awareness umbrella, so that phonological awareness instruction planning needs to aim to systematically, and as early as possible, move language learners toward the phoneme level mastering these two activities.

Beside content, another issue that requires attention in phonological awareness instruction is curriculum design. Many instructors fail not in what they teach but in how they teach it and the methodological planning and effort that it requires in order to achieve educational goals. Chard & Osborn (1998) designed certain principles to be applied in order to increase students' success in acquiring phonological skills:

- Start with continuous sounds rather than stop sounds
- Carefully model each activity as it is first introduced
- Move from larger units to smaller units
- Move from easier tasks to more complex tasks
- Consider using additional strategies to help struggling learners

As any other opponent of language teaching, gathering all possible information that could make a contribution to a better and more comprehensive understanding in regard to the contents, methodology, program duration and assessment within the phonological skills that need to be developed in the learners of a language program is critical for ensuring instructors can effectively teach PA in the classroom.

CHAPTER II

SPANISH LANGUAGE INSTRUCTION

2.1 Active Learning methodology

Active Learning is an instructional approach in which learners can dynamically engage and participate in their learning process. This teaching methodology can be very varied and can be used in any educational context and discipline. Usually, learners work in small or large groups in different activities; however, individual work can also be involved. Many educators think that all types of learning are active in essence and that students are able to engage in a lesson, regardless if they only listen to a lecture; however, Chickering & Gamson (1987) argue that students cannot only listen but also expand their active role with other activities, such as discussion, problem solving, extensive written production, reading out loud, in groups or personally, and so on. Also, considering Bloom's taxonomy (1956), the cognitive level in which this engagement need to occur, needs to be higher than in passive learning, and must include tasks developing creativity, analysis, assessment, synthesis and reflective skills. Siraeva (2018) contributed to this matter, putting a higher emphasis on the know-how of the knowledge and not only in what is done: "active learning involves students in two aspects – doing things and thinking about the things they are doing".

This wide range of teaching strategies stand in contrast to a traditional teacher-centered model, in which only a few students are able to interact with the instructor in asking or responding to directed questions, and where students are only passive

recipients of knowledge or listeners in a lecture (Faust & Paulson, 1998). In a lecture model, students themselves consider their role as receivers of information and, in the same way, instructors see themselves as the providers of such information. This one-way line of knowledge flux allows students to only acquire certain lower-order of thinking skills under Bloom's taxonomy, and does not let students develop other higher skills which are vital to not only acquire knowledge, but also to use it.

Barnes (1989) stated but also proved background principles of active learning that helped understand where activities need to be planned towards, so that students could experience knowledge and apply it into different contextual situations. These seven principles are describe in the table below:

Principle	**Description**
Purposive	The relevance of the task to the students' concerns.
Reflective	Students' reflection on the meaning of what is learned.
Negotiated	Negotiation of goals and methods of learning between students and teachers.
Critical	Students appreciate and review different ways and means of learning the content.
Complex	Students compare learning tasks with complexities existing in real life and making reflective analysis.
Situation-driven	The need of the situation is considered in order to establish learning tasks.
Engaged	Real life tasks are reflected in the activities conducted for the sake of learning.

These principles built a theoretical background for the switch education needed to have in order to improve students skills and outcomes. In the traditional methods (under the "objectivism" paradigm), where students spend most of their time listening

or watching to a lecture and most of their work is individual, the outcomes have been proved to be lower and inferior compared to active learning methodology (under the "constructivism" paradigm), where students actively engage with the knowledge being learned through solving problems, brainstorming, discussion, etc.

Programs based on active learning methodology aim students are able to apply the knowledge they are acquiring in a real life situation, whether it is for their personal every-day life on in a work or community setting, contribution to society and fulfilling their role in the contexts they are involved in. The Council for the Curriculum, Examinations and Assessment [CCEA] (2007) in the UK has researched for decades what was the shift in learning that needed to happen in order to achieve the aforementioned goal, preparing students for a life-long learning journey, for both teachers and students and summarized those roles in the following grids:

	Passive learning traditional methodology	**Active learning methodology**
TEACHERS	Teacher-centered classroom	Learner-centered classroom
	Product-centered learning	Process-centered learning
	Teacher as a 'transmitter of knowledge'	Teacher as an organizer of knowledge
	Teacher as a 'doer' for learners	Teachers as an 'enabler', facilitating learners in their learning
	Subject-specific focus	Holistic learning focus

	Passive learning traditional methodology	Active learning methodology
STUDENTS	Being passive recipients of knowledge	Active and participatory learners
	Focus on answering questions	Asking questions
	Being ‘spoon fed’	Taking responsibility for their own learning - reflective learners
	Competing with one another	Collaborating in their learning
	Wanting to have their own say	Actively listening to opinions of others
	Learners of individual subjects	Connecting their learning

An active, high engaging, and participatory learning environment involves that the teachers/instructors have a shift in their teaching practices and towards learning, from a teacher-centered model to a learner-centered approach. Also they have to dedicate more time and efforts in focusing their practices into the process of the learning goals, rather than the product or result. The changes allow teachers to have an introspective view of their role, and not only of the underlying learning and teaching principles and methods.

The role the teachers assume in an active learning environment, as facilitators, requires to support learners in their path of learning and developing skills, in tasks such as solving problems, team work, community decision-making, and so on. It is normal that in this type of environment, the facilitator role of the instructors assume certain

function in the activities students perform, in order to fulfill certain learning goal or to challenge students cognitive structures. These functions can include being neutral before certain matter, letting students discover by themselves all the possible aspects of it; intendedly assuming a contrary side or opinion from their students' one; taking part of the debate and support certain group in the classroom; informing students of the official regulatory statements given by an official organization or statutory laws; challenging students through questioning so that they have to defend and justify their point of view; among others (CCEA, 2007).

Strong evidence based on decades of research and commitment to education improvement show that there are several benefits in using active learning methodology, which include the increase of learning motivation in students, a decline in course failure, the improvement of students' relational and social skills, the enhancement of information transfer and retention, the improvement of students' critical thinking, etc. (Prince, 2004). Kuh *et al*. (2017) analyzed high impact practices through the National Survey of Students Engagement (NSSE) for about two decades, in thousands of students and their engagement and persistence in their learning processes. The results showed that practical, integrative and active learning experiences lead to high levels of student achievement and personal development. They also reflected on the use of these practices and concluded that they mark an important development in students' success, meaning a high development in "academic achievement, engagement in educationally purposeful activities, satisfaction, persistence, attainment of educational objectives, and

acquisition of desired learning outcomes that prepare one to live an economically self-sufficient, civically responsible, and rewarding life".

2.2 Teaching aspects of Spanish pronunciation instruction

Spanish as a Foreign Language (SFL) has been part of the most famous languages taught since the XVI century. The current reality is that the interest in learning the Spanish language is growing not only in Europe, but in all the world. Students' main interest is the development of oral communication, an aspect that will allow them to get inserted into the international markets with greater perspectives, or simply for cultural and leisure reasons.

Throughout the teaching of Spanish as a foreign language many methods have been presented and applied; however, none of them seems to fully comply with the objectives of foreign students entering the SFL classroom, that is, learning to communicate both by speaking and by writing. Therefore, if the activities conducted inside and outside the classroom focus only on teaching grammatical rules, and do not include several speaking methodologies in order to achieve the communicational goal, it is not feasible that the students acquire such skills. That is the main and most important issue in the matter of teaching FL pronunciation.

Within this perspective, applying the most appropriate method in the classroom is the key to success, not leaving such methods to improvisation, chance or goodwill. They derive from a professional knowledge about the subject. This is the challenge of those responsible for the task of teaching a FL to the growing number of students

around the world. This circumstance forces us to be aware of and to reflect on how to teach a language, as well as on the appropriate training for the future and current educators, a fact that has not been properly addressed in none of the cases, and that is reflected daily in the classrooms, where the students do not seem to be achieving a pronunciation level according to their expectations and, of course, their needs.

In regard to pronunciation, Richard and Schmidt (2002) define it as the way sounds are produced and it also considers the way sounds are understood by the listeners. They argue that pronunciation is a very important part of the language because mispronunciations make it difficult for listeners to understand the meaning of sentences correctly. Furthermore, Harmer (2007) states that pronunciation is not only the way the sounds of a language are made, but also includes word and sentence stress, pitch and intonation, and other features in order to convey meaning. If learners' pronunciation is weak it can have a negative effect on their language ability. Incorrect pronunciation leads to misunderstanding and might threaten communication. In contrast, listeners might consider speakers' language ability easily and effectively when there is a good pronunciation, regardless of possible grammatical mistakes; moreover, bad pronunciation confound them and results in misunderstanding even if speakers have advanced grammar or vocabulary (Pourhosein, 2012).

In regard to teaching pronunciation, many teachers and language instructors tend to be afraid of including pronunciation methodology into their classrooms because they do not feel competent in that area. However, Poch (2004) explains that is not necessary to be an expert in phonetics and phonology to do so. It is important to be clear about

some concepts of teaching didactics in a FL; that is, to know, for example, to differentiate between 'teaching pronunciation' and 'teaching phonetics', matters that are intimately related, but different, so it is essential to go through them in order to overcome such a fear of incompetence. On the other hand, teachers must be very clear that there are different dialects of Spanish and that, therefore, there is not a single possible pronunciation in many of the existing segments; it is also important to consider where the teacher of a given classroom is from, in case of being a native speaker, or what Spanish dialect they learned during their language training, in case of being non-native Spanish language teacher.

Regarding the teaching of phonetics, Llisterri (2003) explains that it consists of an explicit reflection on the system, usually carried out within the framework of philology studies and with it the aim is that the future specialist acquires a formal and detailed knowledge of the articulatory, acoustic and perceptual characteristics of the segmental and suprasegmental elements of the language. It is a task that, for Llisterri, will hardly be carried out by the SFL teacher if it is not at very advanced levels.

Pronunciation is the support of oral language, both in its production and in its perception, which makes it provide intelligibility to the learner’s oral utterance and facilitate listening comprehension. In fact, the students with a high level of phonological competence usually have a high level of listening comprehension. This is because phonological competence is also present in writing and reading, manifested in the inner voice of the writer and the reader. The communicative competence is a complex puzzle of competences in which pronunciation is one more piece, with as much importance as

any other. In fact, phonological competence occupies its own space in communicative competence, since it is inserted within all the other linguistic competences.

Cassany *et al.* (1994) argue that pronunciation should be approached more consistently and systematically, starting from the first FL courses, and without having to theorize about phonetics or phonology. In fact, there is a high level of confusion within the classroom when facing these two teaching approaches, because often their differences are not clearly distinguished. However, teaching pronunciation is certainly not the same as teaching phonetics. Although both disciplines are closely related, they are different subjects and it is fundamental to separate them. Phonetics is an interdisciplinary science that studies sounds, isolated and in contact, and relies on writing. Pronunciation, on the other hand, is the production and perception of speech, and therefore it is applied exclusively through the use of oral language. The former was practically out of the teaching of foreign languages practices for some years, and when it came back to prominence, it started to be included only in a communicative aspect, but with the support to a greater or lesser extent of written texts.

It is necessary that the instruction in pronunciation adopts, to the extent that it is possible, the principles and practices that have been applied in recent years in the teaching of L2. For this, it is fundamental that it assumes the current vision of the language and its learning, based on a communicational approach. However, current teaching practice does not seem to realize its importance. In the case of Spanish, to observe and recognize poor pronunciation in a student of SFL, it is enough to provide the necessary attention, a fact that most of the current teachers do not perform. Poch

(1999) explains this issue in two factors; in the first place, the existence of a series of prejudices about phonetic aspects (or pronunciation) of Spanish. It is true that the orthographic system of Spanish is much simpler than that of other languages, such as English or French, but to affirm that Spanish does not present pronunciation problems and that phonetic correction is unimportant due to the simplicity of its phonological system is a great harm to learning opportunities and a theoretical fallacy.

On the other hand, the fact that the distance between spelling and pronunciation is small does not have to do with the statement that the sounds of Spanish do not involve challenges, since they are almost identical to the sounds of Japanese, for example. All those who at some time have given Spanish classes to foreign students have been able to verify that this is not the case, and that students who speak Japanese as their L1 faced the same difficulties as any other facing the realization of certain sounds. Secondly, there is the belief that in order to deal with pronunciation and correction issues, the teacher must be a specialist in phonetics, a training that SFL teachers and language instructors do not usually have. However, if we consider this statement valid, we would also require specialists in syntax and lexicon to teach grammar, a fact that does not exist. Therefore, it is fundamental to try to determine what phonetic concepts a SFL teacher should acquire, in order to apply the correct teaching methodology in this area and make the corresponding phonetic corrections in the classroom.

Another prejudice about teaching pronunciation is that it is boring. In this regard, it is important to point out that, often, the pronunciation is taught in a boring

way, usually including passive learning methodologies, forgetting the main communicative focus. It is true that the proper contents of pronunciation are abstract (the stress, the accent, the intonation, etc.) and that it can be very difficult to separate the formal component intrinsic to pronunciation; however, we must not forget that every utterance always forms part of a context in which it fulfills an expressive function charged with extralinguistic nuances; the pronunciation also reveals those nuances that help to better understand the meaning of the utterance.

It can be often stated that the main obstacle encountered by a student learning a L2 is neither the vocabulary nor the grammar, but precisely the pronunciation. This phenomenon, which is possible to appreciate at all levels, is more marked in the initial or elementary levels, in which, knowing how to read and write, the student is hardly understood when he speaks, and he can barely understand native speakers. The pronunciation instruction, therefore, should be framed within the necessary oral skills, especially within oral expression and oral comprehension. Certainly, there is no fluid expression if it is not also accompanied by a fluid understanding, and a fluid oral comprehension supposes, in the first place, not the simple identification of the words or grammatical structures, but of the phonic units (the sounds) and above all of the rhythmic and intonational units that are the ones that structure the oral discourse and that allow understanding (Cantero, 2003). Thus, when the teaching of pronunciation is being addressed, necessarily, it means teaching the strategies that would allow the speaker to adequately formulate and understand a genuine and spontaneous oral discourse, as a whole. Therefore, it is essential to know what the mechanisms are to

formulate an oral discourse, that is, how spontaneous speech occurs and how we can segment it. Only then, it can be possible to design effective teaching strategies.

Another important aspect that we must take into account is the perception of language. Poch (2004) focused on the analysis of what is really pronounced in an oral and spontaneous communicative situation in comparison to the real meaning understood by the listener, especially if he is a foreigner. Sometimes, students of a foreign language do not hear what teachers think they should hear, since all the uttered information goes through the phonological filters of their own language, and no native actually pronounces what the phonological systems predict. In fact, sometimes no phoneme is heard in all the lips in the same way. The phonological system has a degree of abstraction and scientific simplification that is not usually taken into account when designing pronunciation objectives (phonology is a discipline in itself theoretical and scientific, not didactic). In the same way that the phoneme represents the ideological item that gives unity to the variety of sounds; sounds, on the other hand, provide the real and concrete form of the theoretical image of the phoneme.

The oral incomprehension of students of a foreign language is not an error of the students themselves or, often, a phenomenon of interference of their mother tongue, but is sometimes conditioned and caused by the phonological and normative teaching approach. It is advisable that FL teachers start from a phonetic perspective, rather than from a phonological perspective; that is to say, that they have a more adequate and precise knowledge of the real production of the natives (the sounds with which the

student is going to face), instead of a schematic knowledge of the abstract units or phonemes.

As for this, the usual practice in the classroom today is precisely the traditional phonetic correction. SL instructors teach how to pronounce one or another word, if necessary they write it on the board, instead of practicing a teaching focused on pronunciation. In addition, very little attention has been paid to the spontaneous conversation in the classroom. The teaching of pronunciation that is practiced in most language centers for foreigners is usually the traditional phonetic correction. This term is full of meaning and connotations: phonetic correction aims at the “perfect” pronunciation, or the closest to it, and loses sight of the communication between speakers. Basically, it consists of correcting the pronunciation errors of the foreign language student (or the native speaker), treating them as a "defective" speaker of that language. The traditional phonetic correction is accompanied by the concepts of error as a basis for intervention, dependence on writing, segmental character of pronunciation, and a traditional application of didactic methodology. Another definition would explain that the phonetic correction consists of correcting the students according to a particular phonic norm, a correct pronunciation model.

A variant of this position is the so-called therapeutic perspective in which the culprits of the “bad” (inaccurate) pronunciation would be the articulatory habits of the student imposed by their mother tongue. Another perspective, called communicative, which does not insist on pronunciation errors, but on the ability to ‘understand and be understood’ in the foreign language. The objective is not to correct but to be able to

‘use' (i.e. utter); it is not to follow rules but to acquire a phonic competence. This last perspective is part of the communicative approach, and aims that students not only have knowledge about the foreign language, but also have the ability to apply and use them in a conscious manner, both in grammatical and written as in oral competence; which will allow the learner to achieve real communication, and it is in here where new methodological approaches take place, such as PA training.

The teaching of pronunciation in general has had an unequal importance within the methods and approaches of foreign language teaching: from the prominence that it occupied in the reformist movement to the secondary role it has had after the introduction of the communicative approach. If we compare pronunciation with other linguistic levels, we will understand why some authors consider it the "Cinderella" of foreign language teaching (Kelly, 1969). The change of focus in the teaching of Spanish Language affected considerably the pronunciation instruction, since techniques of structural methods were rejected and no others, designed from the communicative point of view, were proposed. The result of these contradictions is an unsystematic presence in the teaching of the phonological component of Spanish language learning manuals. Therefore, in the current teaching of foreign languages it is common to relegate the pronunciation, and especially the prosody, to a second place of relevance due to the following reasons (Cortés, 2002):

1. Lack of awareness of the importance of intonation by material designers and teachers.

2. Inappropriate teacher training in the phonics field and, above all, in the didactics of pronunciation.

3. Little attention to suprasegmental phenomena, as the main focus tend to be the traditional segmental phonology, centered basically only in phonemes.

4. The belief that intonation is a complex phenomenon, difficult to describe or even impossible to teach.

5. The belief that the acquisition of intonation is learned simply by listening to Spanish language in class.

Furthermore, there is a limited amount of resources, not only teaching pronunciation in Spanish but also assessing this skill in learners and provide a throughout understanding of the phonological levels students need to achieve during their learning path. The Common European Framework of Reference for Languages (CEFR, 2002) divides the communicative competences of the language into six different competences. Among the competences, phonology includes, on one hand, the knowledge and skills in the perception and production of sounds, phonetic features, composition and phonetic reduction and, on the other, the phonetics of sentences (prosody), which consists of the accent and rhythm of sentences and intonation. The paper shows a total of 32 holistic and analytical scales of language level descriptors, but only one of them incorporates the skills of pronunciation.

It seems that the CEFR established the levels by giving priority to fluency versus correct or perfect pronunciation. Learners, at the initial levels (A1 and A2) and at level

B1, are expected to have a "foreign accent" that they do not lose until level B2, when "they have acquired a clear and natural pronunciation and intonation" (CEFR, 2002). Only from this level on, there is reference made to intonation. In addition, for the CEFR, the C1 level is the highest that can be achieved in pronunciation, unlike other components of the language, in which a learner can reach C2. This means that pronunciation and intonation are not evaluated the same as the other components of the language. It seems, therefore, that for the CEFR the perfect pronunciation and intonation are unattainable and/or unnecessary.

In the Curriculum Plan of the Instituto Cervantes (2007), unlike the other inventories that respect the six levels established by the CEFR, the treatment of the phonic aspects is carried out by grouping the six levels in the three stages (A, B and C), arguing that it would be "technically very difficult to establish a more detailed gradation". The main objective in phase A (A1 and A2) is to recognize the phonic patterns of Spanish and produce their basic patterns, while in stage B it is necessary that the learners progressively adjusts their pronunciation to that of Spanish and are be able to express certain moods with it. In the refinement phase, stage C, the learners' pronunciation should resemble a native speaker, taking into account the appropriateness of the intonation to moods, pragmatic intentions and know-how to modify the tempo and articulation according to the communicative situation. The inventory of "Pronunciation and prosody" includes the following elements: 1) The basis of articulation, 2) The intonation, 3) The syllable and the accent, 4) The rhythm, pauses and time (CEFR, 2007) .

The Instituto Cervantes' scales of qualification of the oral expression and interaction tests in the Spanish as a Foreign Language Certification (DELE, for its acronym in Spanish) exams, do not make any reference to the pronunciation and prosody in the holistic scales but in the analytical ones. These contain in A1 and A2 the criterion of pronunciation apart from coherence, correction and range, and in levels B1-C2 the criterion of pronunciation is replaced by fluency. Intonation is referred to within the coherence category at levels C1 and C2.

Given that the phonological scales seem scarce, Horner (2014) proposes some descriptors that seem more detailed compared to the existing scales. All six levels show the phonological skills learners should achieve while leaning Spanish as a foreign language:

A1	Sufficient command of sounds to be understandable, but not all of the time and with some difficulty. Sufficient command of word stress to be understandable, but not all of the time and with some difficulty. The interlocutor will need to ask for repetition or clarification.
A2	Sufficient command of sounds to be understandable, but with some difficulty. Sufficient command of word stress to be understandable, but with some difficulty. The interlocutor may need to ask for repetition or clarification.
B1	Sufficient control of sounds to be understandable. Sufficient control of word stress to be understandable. Mispronunciations occur, but only occasionally interfere with understanding.
B2	Speaker is understood. Mispronunciations occur but do not interfere with understanding. Sentence stress is used but not always successfully. Basic intonation patterns are used, but not successfully all the time.

C1	Speaker is easily understood. Mispronunciations are rare. Sentence stress is used successfully most of the time. Intonation is used but not always effectively.
C2	Speaker is easily understood. Mispronunciations are rare. Sentence stress is used successfully most of the time. Intonation is used successfully most of the time.

Therefore, considering the lack of instruction teachers have and their reluctance of including pronunciation into their lessons, the impediment of materials not including enough pronunciation features in regard to all phonological levels and skills, the scarcity of clear and on point phonological descriptive scales to understand the achievement goals learners need to aim during their learning process and all other possible and discussed factors, it is noticeable that there is a lot of work to be done in this area and more research need to be carried out in order to have a broader view of how to approach the challenge of including Spanish pronunciation into language lessons.

2.3 Dialect varieties in teaching Spanish as a FL

It is likely that the first of the questions on which SFL teachers should reflect on is what pronunciation should they teach in their classes. It would be false to say that there are 'good' pronunciations and 'bad' pronunciations of Spanish, but what is certain is that all varieties have their 'standard' with certain characteristics. The factors that determine what this prestige-like pronunciation are usually not linguistic but, in general,

historical, economic and social. In effect, no language or linguistic variety has more interest than another for its study, nor are they better than the others.

The CEFR (2002) indicates that "dialect and accent" are an important part of the sociolinguistic competence, which are interpreted as the community and individual linguistic habits that indicate the social and geographical origin, that is, the sociocultural level and the dialect or variety. It is important to highlight, within the umbrella of the this competence, the linguistic markers of regional and national origin, which are later accompanied by concrete examples of dialectal variation for Spanish in the lexical, phonological and prosodic levels.

It is expected that every Spanish teacher, based on their geographical origins, will speak a specific variety of the language they teach and, therefore, it will be the one their students will be taught. This is a usual situation, and whether an SFL instructor decides to teach their own dialect or a standardized variety of the Spanish pronunciation system, both would be completely acceptable. The knowledge of the standard, then, must serve in a way that the Spanish teachers establish, with respect to themselves, their students' pronunciation variety and even their own, and so that they can give the students the pertinent explanations. In this situation, Poch (2004) explains that SFL teachers will display on their pronunciation the characteristics of the Spanish spoken in the area they were born or the variety they learned. It is normal and logical that such teachers do not modify their pronunciation to give their class, but they should know the standard to know how to locate, with respect to it, their own linguistic variety.

There are two other important aspects to consider. First, the need that, in order to achieve a native or almost native Spanish competence, the students follow a given variety, at the level of their active Spanish, even if it is spoken by a small minority. The same happens with any other language; even in English, for example, where it is recommended to decide which variety to follow (American, British, Australian, etc.) and to stick to that given variety as much as possible. It is unrealistic to believe students can learn all varieties and that teachers can cover all possible differences among them. And second, that students follow a given variety within the first months of contact with Spanish, since at the beginning of learning is when a learner creates the phonetic, morphological, lexical and syntactic framework around which the student will organize the data of the input to which it is exposed.

Although initially it is more convenient to limit the teaching to a single normative variant, it will be essential to consider also the regional and social varieties, as well as the variety features with a wide territorial extension, not for students to incorporate them into their oral production, but to broaden their knowledge and thus improve their understanding of Spanish. All these aspects are important when teaching SFL, since they will help learners understand how variable and flexible Spanish could be in regard to the different linguistic aspects, specially the phonological one; moreover, they take us away from the idea that a certain Spanish dialect is better than others.

In the case SFL students out of the Spanish-speaking community, in a country whose official and vernacular language is not Spanish, the needs and expectations of the students are decisive. These factors should not be understood only as what the students

want, but also what is reasonably convenient for them in their specific circumstances. As before mentioned, the standard should be considered relevant in any language instruction program, and such relevance is shown in several ways. Furthermore, the standard is systematic and basic, somewhat invariable and easy to learn, and it allows learners to implicitly access all the possible norms, at least in a strict sense, since it contains such common features.

So, what should be the chosen one? Any, in response to different conditions: prior knowledge by closeness with a Spanish-speaking country (e.g. the Caribbean variety for Haiti), presence of immigrant communities from that source and abundance of that variety in the environment (e.g. the Mexican variety for the southwestern zone of the United States of America), special significance for historical links (e.g. one of the Spanish varieties for Portugal, in which the first condition is also met), recognized prestige (e.g. the Castilian variety or another Spanish variety for England), economic interests (some Spanish-American varieties for Japan), etc.

PA training, in this respect, becomes a great tool in regard to the necessary phonological knowledge to acquire a given language dialect, because it can describe the small nuances within the phonological changes produced in all geographical varieties. Moreover, PA training gives, until some extent, phonological independence to the learners, so that they can continue developing their linguistic path in whichever language variety they feel fit best for their needs or interests.

2.4 Comparison between Spanish and Japanese liquids

Japanese and Spanish are certainly two very different languages, in regard to their origin, grammatical structure, lexicon, writing systems, among many other areas. However, at the phonological level, Japanese and Spanish have some similarities (Ueda, 1977); both have 5 vowel sounds, share the same stops, share most of the fricatives, and more. Nevertheless, as in any other pair of languages, there are some segments not shared in both sound systems, which is the main subject of this study. Considering the phonetic level, there are also several differences, such as the case of the Japanese syllable structure, which certainly interferes in the pronunciation of SLLs (Carruthers, 2005).

In regard to the Spanish syllable structures, even though they are mainly formed by a CCVCC pattern, they tend to prefer simple onsets, mainly CV (55.81% in frequency) and CVC (21.61%). Cluster onset and coda structures are commonly formed by liquids. For Spanish onsets, there are only single consonant elements or paired consonant clusters (CC), where liquids always take the position of the second consonant element in the cluster. In the case of codas, even though most part of the syllabic structures are coda-less, to find liquids in post-nuclear position is possible, but not frequent, except for the liquid word final position, considering that a great number of such words are loanwords from many languages (Proctor, 2010).

Spanish phonological system has 3 liquid sounds. The rhotic [r] is an alveolar apical voiced trill which is one of the three liquid consonant sounds, very distinctive of Spanish language, that any average Spanish speaker can distinguish; besides the other

apical rhotic (tap) [ɾ] and the only lateral [l]. Both Spanish rhotics are only found in contrastive distribution in intervocalic position, while in other word positions they are in complementary distribution; trill [r] prevails in word initial position and in onsets following [n], [l] and [s] segments. On the other hand, Japanese has only one liquid sound, generally uttered as an apico-alveolar tap [ɾ] (Hattori, 1951) and it occurs only in a CV onset structure. However, it is possible to find the segment [r] in free variation, but culturally its utterance bears a strong 'gangster' stereotype for listeners and is sometimes being used by Tokyo-area male speakers to connote 'toughness' (Vance, 2008); however, because of its connotation of 'vulgarity', it tends to be avoided (Labrune, 2012). According to Ladefoged & Maddieson (1996) and Akamatsu (1997), the notation of [ɾ] as a tap [ɺ] is described as being a central indeterminate, so that for notation purposes, this phonological representation will be used.

Japanese language does not have distinctive liquid segments, but the Spanish sound inventory has [r], [ɾ] and [l], and despite that there are several allophones of the Japanese liquid [ɺ], they do not trigger any miscommunication in all their possible deviations. However, it is important that Spanish FLLs are able to identify the importance of these distinctive segments, as it could lead to misunderstanding, as in the case of the following minimal pairs:

***pe<u>l</u>o* [l]** (hair) - ***pe<u>r</u>o* [ɾ]** (but) - ***pe<u>rr</u>o* [r]** (dog)

No tengo ni un pelo (I do not even have a hair)

No tengo ni un pero (I do not even have a 'but' [objection])

No tengo ni un perro (I do not even have a dog)

Furthermore, due to some phonological correspondence in both languages, the three liquid segments had to be considered in this study, in order to be able to contrast the only Japanese liquid segment with the two Spanish ones sharing similar phonological categories and the trill segment which does not share any other category besides its manner of articulation. However, even though [r] is not part of the formal Japanese phonological system, Japanese speakers are not completely unfamiliar with this segment, as it could be found in Tokyo's Shitamachi dialect, making a variant of 'vulgarity' (Labrune, 2012, p. 92); or used sometimes by male speakers to connote 'toughness' (Vance, 2008), and therefore, its use tends to be avoided.

Young children learning Spanish as a first language tend to take longer in acquiring liquid sounds compared to other consonant segments, because it involves a more complex articulatory lingual coordination (Proctor, 2010). Therefore, it is expected for FL learners to take some time in acquiring such phonemes into their phonological repertoire, especially the trill segment [r], due to its intrinsic complexity (Hammond, 2000). However, adult university learners are likely not to have this required time of phonological acquisition, due to the reduced length of the language learning programs they study (unless their major consists of a given foreign language). The time invested teaching foreign sounds can play a big difference in students' motivation and further beyond if learners will be able to get closer to a more native pronunciation (Gilakjani *et al.*, 2011). In this case, as liquids are acquired significantly later in life, adult student tend to substitute the target rhotics with the rothic repertoire available in their L1 and do not succeed much in uttering laterals in coda positions (Proctor 2010).

CHAPTER III

METHODOLOGY

3.1 Objectives

This study intends to increase awareness of the impact that PA training methodology has on the articulatory accuracy of liquid segments, of Japanese students of Spanish as a FL. In order to achieve this, the use of traditional instructional methodology for language learning and PA training (using active learning methodology) will be compared in regard to the phonological accuracy achievement of students. Even though the methodology applied is not the main focus of this study, active learning techniques were chosen in order to maximize students' participation and because they are not only student-centered but also highly motivational (Mccarthy & Anderson, 1999).

Furthermore, and as explained in chapter 1, the traditional PA model (Bernhardt and Stoel-Gammon, 1994), which is used to assess and, to a large extent, instruct language learners, has remained unchanged over the years, mainly due to its relation to the acquisition of reading skills in young kids (Badian, 1998; Smith, Simmons, & Kame'enui, 1998; Shaywitz, 2003). However, some insights will be given in regard to the footpath followed for young learners versus how certain stages of the model could be skipped in the PA training of young-adult/adults subjects.

Finally, the phonological interferences, within the range of liquid segments, which Japanese students struggle with while learning Spanish as a FL, will be analyzed

and schematize in order to address the phenomena from not only a pedagogical approach but also from a scientific/phonetical perspective, so that it is possible to identify the key areas of phonological improvement students need to focus on and maximize the efforts in their FL learning process.

3.2 Research Questions

Based on the research described in the previous chapters and challenging the traditional methodological view of teaching pronunciation in a language learning setting, the following questions came up to be addressed within this research paper:

1. Do students improve their phonological accuracy of the Spanish liquids in a natural FL environment and without any explicit phonological training?

2. How much could phonological awareness affect the phonological accuracy of FLL after one single PA training intervention?

3. What are the phonological interferences involved in the articulation of the Spanish liquids in the reading process of FL students?

3.3 Research Hypothesis

The traditional common sense would alert that following any FL learning methodology would help students learn, improve and develop the necessary skills to achieve language proficiency. There are several studies in how this can or cannot work in a varied range of skills, such as grammar, reading, writing and so on. This time, as the focus of this paper is the learners' phonological skills, we wanted to challenge the

effectiveness of the traditional methods in comparison to the explicit training of phonological awareness skills in an active learning methodology setting. Therefore, the null hypothesis (H0), to be rejected later on in the reflection and discussion of this paper, and the alternative hypothesis (H1), which is the main proposal of this research work, are described as follow:

H0: Students learn liquid segments in a natural FL environment without any specific phonological training.

H1: Phonological Awareness training can significantly improve phonological accuracy of FLL.

3.4 Participants

Subjects recruited were 123 Japanese university students (18+ years old) learning Spanish as a Foreign language and being within their first year of language training (considering that only 1 year of FL training is required in their university program; further levels are optative courses). From the students recruited 118 were selected; the rest were not included due to several factors (lack of material, absences to activities, quality of material recorded, among others).

The subjects were divided into two groups: the Control group or GA and the Phonologically Trained group or GB. Each group consisted of 59 students; GA: 27 male and 32 female, and GB: 29 male and 30 female. Both GA and GB were subdivided into two subgroups (GA1, GA2, GB1 and GB2 respectively); each subgroup represented a university Spanish course (i.e. 4 class groups in total). Even though each subgroup did

not consist of an equal number of male and female subjects, both GA and GB seemed to have a statistically fair number of both genders (Table 1); nevertheless, the distinction between GA and GB was analyzed in terms of the gender variability.

Table 1. *Participant distribution by gender*

Gender	**Group A : control**		**Group B: phonologically trained**	
	males	female	male	female
GA1	8	18		
GA2	19	14		
GB1			23	8
GB2			6	22
SUBTOTAL	27	32	29	30
TOTAL	59		59	

3.5 Assessment Criteria

Both the control group and the trained group were assessed throughout their Spanish course, under the corresponding university course syllabus, which included periodic vocabulary quizzes, compositions, oral presentations and reading video recordings. For the latter, a communicative approach was used in order to assess the students' progress, considering the assessment of fluency, pronunciation and intonation, among others. No examination was specifically prepared to assess the students out of their planned curriculum for both GA and GB (before training), except for the 5-minute one-to-one interview session used to assess students' achievement after PA training, where the main and only criteria considered for assessment and analysis was the students' phonological accuracy of the liquid sounds.

3.6 Data Collection

The control group (GA) did not receive any kind of PA training, learning under a language-learning traditional methodology and following the informed university course syllabus. During two terms, students were assessed in multiple ways, which included a number of audio/video recordings, mainly for evaluating students' reading and pronunciation skills. As a matter of confidentiality, all recordings were collected in audio format. Such audios were oral examinations based on a set of given texts (Excerpt 1) studied during their program, where structures, vocabulary and others were previously analyzed in class, so that students were familiar with them at the time of recording. Students were able to record their oral examinations as many times as they considered necessary (within a given time) and, therefore, submit the version they felt satisfied with. As a result, an actual 7-month span of 12 audio sets per student were collected and analyzed.

Excerpt 1. Reading Assessment Text Sample

01	Ramos:	Sí, pasen
02	David:	Buenas tardes, señor Ramos.
03	Ramos:	Buenas tardes.
04	David:	Quiero presentarle a la nueva estudiante, Silvia López.
05		Silvia, el Señor Ramos es el director de la escuela.
06	Silvia:	Mucho gusto, señor Ramos.
07	Ramos:	Es un placer, Silvia.
08		Bienvenida a Montebello High.
09		Eres de Ecuador, ¿verdad?
10	Silvia:	Sí, señor, de Quito.

From the 12 audio sets, 7 lexical units with the target segment [r], 14 with the segment [l], and 13 with the segment [ɾ] were identified; for the [r] segment , all the lexical units were included, and for the [l] and [r] segments, only the single utterance CV/VCV-syllabic structure (initial or middle position) units were selected, and more complex structure units were dismissed. Such lexical units had different utterance distributions varying from 1-4 times per unit (Tables 2A, 2B and 2C). For each segment, a different number of utterances were found ([r] = 743; [l] = 1,295; [ɾ] = 949); Most of the lexical units vary on the number of utterances due to the lack of complete material from students, poor quality of the audios or omissions of the utterance of the lexical units in the recordings. Some lexical units show a higher utterance frequency rate due to being assessed more than once within the 12 audio sets, or within the same script in one single assessment.

Table 2A. *GA Lexical Units Frequency for [r] segment*

Lexical units	**Group A : Average Frequency**	**Group A : Total Utterances**	
		GA1 (26)	GA2 (33)
restaurante	4	99	129
Ramos	3	78	99
Rico	2	50	62
Riqui	1	26	31
guitarrista	1	25	32
Rosa	1	25	32
aburridas	1	26	29
SUBTOTAL	13	329	414
TOTAL		**743**	

Table 2B. *GA Lexical Units Frequency for [l] segment*

Lexical units	**Group A : Average Frequency**	**Group A : Total Utterances**	
		GA1 (26)	GA2 (33)
Lupe	6	150	190
hola	3	75	91
baile	2	48	65
luego	2	48	65
lápiz	1	26	32
escuela	1	26	32
lunes	1	24	31
excelentes	1	24	33
alemán	1	25	32
elegantes	1	25	33
lago	1	26	29
helado	1	26	29
salimos	1	24	32
familia	1	26	28
SUBTOTAL	23	573	722
TOTAL		**1295**	

Table 2C. *GA Lexical Units Frequency for [ɾ] segment*

Lexical units	**Group A : Average Frequency**	**Group A : Total Utterances**	
		GA1 (26)	GA2 (33)
ahora	3	74	91
señorita	2	50	63
gustaría	2	52	62
caramba	1	25	31
interesante	1	25	31
hora	1	25	32
tarea	1	23	32
restaurante	1	25	33
aire	1	24	33
verano	1	26	29
periódico	1	25	29
espérame	1	26	29
enero	1	26	28
SUBTOTAL	17	426	523
TOTAL		**949**	

The PA Trained group (GB) was assessed before and after the training session. For assessing students before the training, a similar methodology used for GA was chosen; students recorded some audios as part of their course oral assessments and such material was revised and classified. The lexical units for both GB1 and GB2 were not the same due to different examinations given to the students. However, from the audio sets recorded and submitted, it was possible to identify a similar amount of utterances for both groups which would allow a reasonable comparison between them. In the same way, not all the lexical units had the same utterance frequency, as seen in Tables 3A, 3B and 3C.

Table 3A. *GB Lexical Units Frequency for [r] segment before PA training*

Lexical units	**GB1: Average Frequency**	**GB1 Total Utterances** GB1 (31)	**Lexical units**	**GB2: Average Frequency**	**GB2 Total Utterances** GB2 (28)
pizarra	1	31	*Raul*	1	28
borrador	1	31	*regular*	1	28
terrible	1	31	*recreo*	1	28
Ramos	1	31	*aburrido*	2	56
perro	1	31	-	-	-
SUBTOTAL	5	155		5	140
TOTAL	**295**				

Table 3B. *GB Lexical Units Frequency for [l] segment before PA training*

Lexical units	**GB1: Average Frequency**	**GB1 Total Utterances** GB1 (31)	**Lexical units**	**GB2: Average Frequency**	**GB2 Total Utterances** GB2 (28)
mochila	3	93	*escuela*	1	24
lista	1	30	*León*	1	26
escuela	1	31	*López*	4	112
Lupe	2	59	*Lupe*	3	78
López	2	62	*hola*	1	28
SUBTOTAL	9	275		10	268
TOTAL	**543**				

Table 3C. *GB Lexical Units Frequency for [ɾ] segment before PA training*

Lexical units	**GB1: Average Frequency**	**GB1 Total Utterances** GB1 (31)	**Lexical units**	**GB2: Average Frequency**	**GB2 Total Utterances** GB2 (28)
caramba	1	31	*señorita*	1	27
mira	1	30	*quiero*	2	56
señorita	1	31	*eres*	1	28
eres	1	30	*morena*	3	78
quiero	1	31	*mira*	1	28
SUBTOTAL	5	153		8	217
TOTAL	**370**				

Later on, the students were trained in a 20-minute theoretical-practical session as described in Section 3.9, where they were phonologically instructed on the Spanish liquid segments [ɾ], [l] and [r]. The session was prepared and carried out using an active learning methodology, with activities such as brainstorming, fishbowl and peer reviewing.

After the session, each student had a 5-minute one-to-one interview session with Spanish native speakers (two licensed language instructors), where students were able to reinforce the content learned in the PA training, using re-modeling, minimal pairs and reading activities. At the end of the interview, after students recognized the studied segments in certain lexical units they were asked to utter and differentiate the contrastive segments: [ɾ], [l] and [r] in some selected lexical units. Finally, students' utterances were analyzed by the direct perception method using a checklist, where only five lexical units were selected from the whole set used in the interview session. As it

was a controlled examination environment, it was possible to sustain a fixed number of utterances per lexical unit (Table 4).

Table 4. *GB Lexical Units Frequency for all segments after PA training*

Lexical units			**Group B : Average Frequency**	**Group B : Total Utterances**	
[r] segment	**[l] segment**	**[ɾ] segment**		GB1 (31) x 3	GB2 (28) x 3
Ramos	*lunes*	*para*	1	93	78
rico	*lana*	*pero*	1	93	78
aburrido	*solo*	*señorita*	1	93	78
perro	*pelo*	*tarea*	1	93	78
r̲estaurante	*pala*	*hora*	1	93	78
		SUBTOTAL	5	465	390
		TOTAL		**855**	

3.7 Phonological Accuracy Analysis

For GA, each audio was analyzed by the direct perception method, supported by a speech analysis software (PRAAT) as recommended by Pearce (2011). This software allows researchers not only to identify sounds more accurately but also give a whole spectrum of phonological information that can be included for further analysis.

Then, after the articulatory accuracy was determined per lexical unit and per segment, the data was schematized and rates of accuracy frequency were estimated per subgroup and as a whole. Such rates were compared along the learning process and it was possible to estimate the improvement mean of each GA group. Fisher's exact tests

were conducted to verify the statistical significance for both group performances and if there were any differences between male and female subjects.

For GB, audio samples containing the target segments were selected from the pool of oral examinations available previous to the PA training, and underwent a similar analysis to the samples analyzed for GA. Different lexical units (4-5) were assessed for both groups for each of the target segments (with different utterance distributions, varying from 1-3 times per unit); this was because the assessment texts varied in GB1 and GB2. Articulatory accuracy rates were also estimated. A chi-squared test for independent samples was carried out to ensure there was no difference between GB1 and GB2 articulatory accuracy performances.

For the interview session (post training), five lexical units were selected from the sample; all of them were previously reviewed by students during the course of the term subject and had equal distribution and frequency per student. Checklists were used to determine articulatory accuracy per student and per group. Following the same pathway, chi-squared tests for independent samples were conducted to determine whether there was any statistical significance between both groups (GB1 and GB2) and also between male and female subjects. Finally, in order to analyze how significant the impact of PA training was within the GB group, a paired unilateral *t* test was performed considering the articulatory accuracy rates before and after the training.

Finally, both GA and GB were compared in terms of their articulatory accuracy rates, considering both the initial and final means, in order to analyze in parallel the articulatory accuracy improvement of both groups and the impact of PA training in a FL

phonological environment. A t-test for 2 independent means was conducted to verify the significance of the impact of PA training on the groups' articulatory accuracy improvement.

3.8 Phonological Interferences Analysis

Even though most of the recording were analyzed with the direct perception method, the speech analysis through PRAAT helped to precisely identify all the segmental categories, whether they came from the target segment or some phonological interferences. Also, some of the audios were randomly chosen to undergo this analysis to verify the accuracy of the direct perception method.

Through these spectrograms, it is possible to clearly see how the segment [ɾ] shows one single flap in its articulation (Image 2), whereas the trill [r] vibrates in multiple periods when being uttered (Image 1). Despite the fact that neighboring vowels can affect the way certain sounds are articulated, creating multiple allophonic deviations, such phenomenon will not be covered in this study, but it will be considered for possible allophonic utterances within the articulatory accuracy ratio.

Image 1. PRAAT Spectrogram of 'rico' - segment [r]

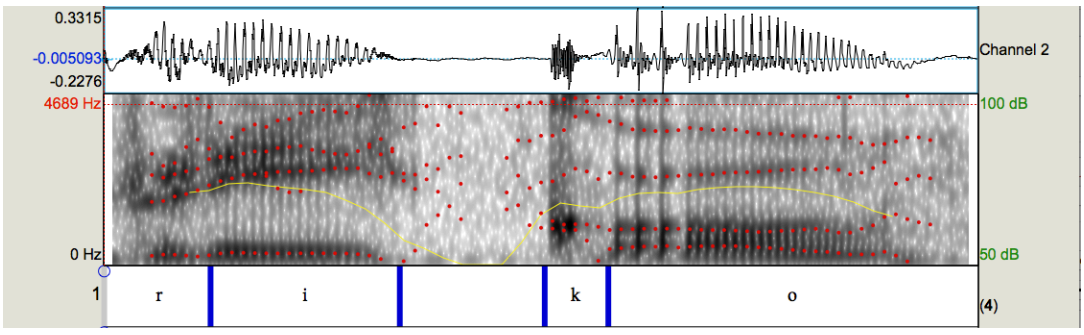
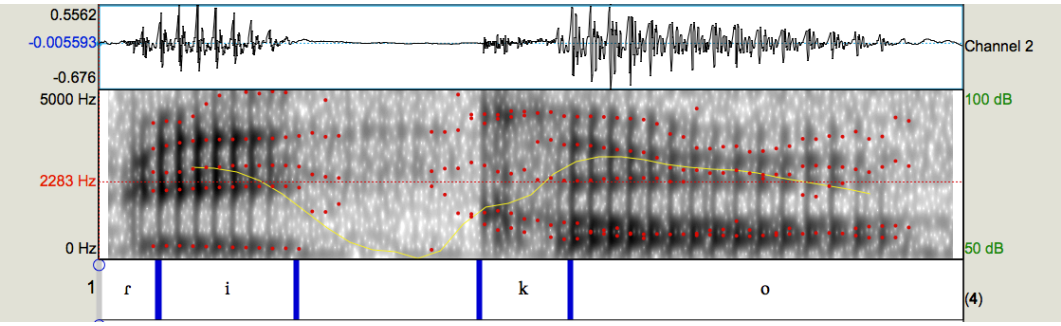


Image 2. PRAAT Spectrogram of 'rico' - segment [ɾ]



After analyzing all the recordings, the interferences found were organized in three groups: segmental (L1 segment is transferred directly into L2), allophonic (certain features of the L1 closest segment are transferred into L2 as another segment in the L2 phonological inventory) and others (mainly coming from a pre-existing L2). Within these three groups, four main interferences were found: [ɺ] which is the main Japanese segment, [ɾ] and [l] which come from the Spanish inventory but share certain features with the former, and [ɹ] which was the most frequent and significant interference in this group. The groups and interferences were organized as follows (with their phonological categories):

Segmental: [ɺ] : alveolar - lateral - flap

Allophonic: [ɾ] : alveolar - flap

[l] : alveolar - lateral - approximant

Others: [ɹ] : alveolar - approximant

[d]: alveolar - occlusive

[n]: alveolar - nasal

Interferences with the segment [ɹ] are identified as probably coming from students' former L2 language; as all of them have received a certain degree of foreign

language training (English, in this case), during their secondary education years (being part of the Japanese national curriculum), as well as current credit requirements in their university programs. However, the number of interferences with such a segment is low enough to not further go on with their possible causes and variables.

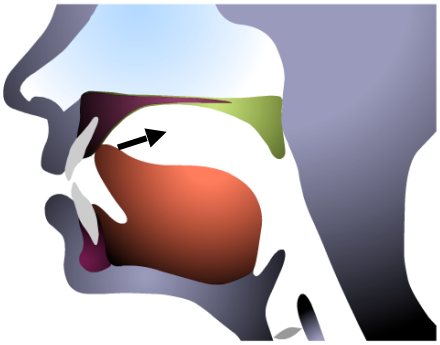
3.9 PA Training Session

All GB subjects, both GB1 and GB2, were trained under the same conditions in their own subgroup sessions. The instruction/intervention consisted in a 20-minute session and it was composed of four parts. First, students were invited to give their ideas (brainstorming) about the process of articulating the target sounds and introspectively analyze the process within the articulatory speech mechanism. All the ideas were quickly noted on the bored so students could have a visual of the main points of the discussion. Then, based on these ideas, the instructor took some minutes to explicitly explain and contrast the articulatory mechanism of each one of the Spanish liquid segments involved ([ɾ], [l] and [r]) and their differences between the Japanese liquid segment and the Spanish ones, and then modeled the articulation of each one of them. Students were asked to try the utterances after the instructor modeling. During this time, students were given a handout[1] with graphical descriptors of the articulatory process for each sound and a brief list of words containing the segments, which were practiced subsequently. The handout graphical descriptors were shown as the example below:

[1] For the complete handout, see Appendix section in this paper.

/ ɾ /: flip slightly & quickly

Ex: para, pero, sobre, martes, cuerda



In the graphical representation of the articulatory mechanism, students were asked to identify each of the organs in the articulation involved and to use them in certain way in order to utter the target segments. In order to develop such a skill, two more active learning methodology activities (as described in chapter 2) were carried out to achieve the intervention goal, which was to make students rationally understand the utterance mechanism of the target segments in order to improve their articulation (i.e. pronunciation). The final two activities were group-based (small groups and in pairs) and were aimed to reinforce the content learned and to practice the target sounds in the classroom. While performing these two activities the instructor monitored the advance and development of them and help groups to properly achieve the intervention goal. The training lesson plan is explained as follows:

PA intervention session for GB students

Activity:	**Brainstorming**: This method is a high stimulating free-thinking resource that help students look for a solution to a problem or in providing multiple ideas in a specific matter. Questions like "How can we…?", "What do we know about…?" or "What do you think about…?" prompts the students' participation and encourages the learners to express themselves in their own cognitive level. The ideas coming up should be written or noted without any comment or argument about them, whether positive or negative, which will be used later on as a basis for a problem-solving activity or a presentation/explanation given by an instructor.	
Time	**Description**	**Expected response**
5 minutes	- Students will be given some questions to think about and all their tentative responses will be written on the board. The questions to be discussed are: 1) What elements do we use in our mouth to make language sounds? 2) Which parts do we use to make the sound [ɾ]? 3) Which parts do we use to make the sound [l]? 4) Which parts do we use to make the sound [r]? 5) What do you think are the main differences in making these sounds?	- Students will be able to freely offer responses without having to fear being "wrong". - From their responses the names of the articulators involve will appear on the talk and, from then on, it will be possible to use such terminology with the students. - Students will reflect about what happens in their oral cavity when trying to utter the target segments and will be more aware of their articulatory mechanism.

Activity:	**Expository Instruction**: Even though there is a high reluctancy to use this method within Active Learning methodologies, this resource is high valued when performed correctly. Engaging students during the instruction, properly using the time in short intervals and continuous interaction (theory/practice-based) are key to succeed in using this modality. "Learning by doing" should be the basis of this strategy, where the instructor explanation should be followed by a practical example or demonstration; in contrast to an traditional expositive lecture, where the instructor uses almost all of the time in the expository item.	
Time	**Description**	**Expected response**
7 minutes	- Students will receive a handout with the graphical descriptor or the articulatory process for each sound. It will also contain a brief list of words examples containing the target segments. - Based on the ideas given by the students in the brainstorming, the instructor will briefly explain the main articulatory process of each one of the target segments. - Then, The instructor will model how to utter the target segments and will ask students to emulate the sounds utterances. - Finally, the instructor will show and model some minimal-paired segment-contrastive lexical units in order to contrast each one of the liquid segments and will ask students to emulate such differences.	- Students will be able to understand in detail which articulators are involved in the utterance of the target segments and how the articulation of them is carried out. - Students will identify each one of the target segment by carefully listening to the instructor and emulating the segments in the word examples. - Students will differentiate the contrast the liquid segments by using their PA skills: discrimination and substitution of segments within a word.

Activity:	**Fishbowl**: A fish bowl is a dynamic group-involvement activity in which a small group of students (usually volunteers) participate "inside" the "fishbowl and the rest of participants join "outside" the fishbowl. The inner-circle students work as showers/doers of a specific assignment or as a discussion group in a given topic, while the outer-circle ones work as the observation group. The students in the outer circle are free to join the inner circle to either replace their classmate or to provide additional evidence to support the explanation.	
Time	**Description**	**Expected response**
4 minutes	- For this activity, the instructor will select a few students (group leaders) who were able to articulate the segments during the modeling in the previous activity. - Then, the instructor will ask these students (inner circle) to show a small group (out circle) how they articulate the target segments and explain in their own words what it is required to make it happen (the setting of the classroom divide the students into small groups per table and allow such interaction). - Finally, students will give some feedback to each other. In case there are questions, they can ask either the inner circle students or the instructor.	- Students will engage in a group interaction with their classmates and will be able to use their phonological awareness knowledge explicitly. - Listeners (outer circle) will be able to understand and mimic the modeling students from a different perspective. - Students will give and receive general feedback in terms of their utterance attempts.

Activity:	**Peer reviewing**: This method allow students provide their peers with feedback on their work, whether they are papers, lab reports, presentations or any other class performance or concrete product. It is important to structure the activity correctly, so that students understand the framework of their classmates work. It is also recommended to provide a rubric where the descriptors of the performance expected are clearly expressed and do not lead to confusion. Finally, students should provide with constructive and supportive feedback to their peers, in order to encourage their efforts in the learning experience.	
Time	**Description**	**Expected response**
4 minutes	- In this activity, students will work in pairs. They will practice together the given set of words while checking their partner pronunciation, helping them make any correction if necessary. - Pair who still struggle in their performance will be able to ask support to the instructor, who will provide any extra insight required to help students achieve the set goal for the lesson. - Students will be able to use the handout to read the examples given or any other material from the class. - Students will provide verbal feedback to each other.	- Students will have further practice in a more personalized way, so that students who did not feel comfortable in speaking in the bigger group could be confident enough to work in pairs. - Student struggling in the activity will feel more confidence in asking for support as the activity aims for individual performance. - Students will also give and receive a more personal feedback by their peers, in terms of their utterances of the target segments.

After the session, students gave a very positive oral feedback and showed willing to continue further phonological training. Also, they mentioned that being explicitly explained about how to articulate segments that seemed so similar or have a high degree of difficulty for them as Japanese native speakers, was very helpful in terms of cognitive processing and comprehension. Unfortunately, the feedback was not recorded and there will not be further analysis of the emotional reception and motivational impact of the intervention session, as it was not part of the purpose or objectives of this research paper, and might be a research opportunity for future projects related to PA teaching methodologies.

CHAPTER IV

RESULTS

4.1 GA Results

The phonological accuracy rate varied during the 7-month learning span (see Figure 1A, 1B & 1C) for GA, from the first assessment session ($\bar{x}$ = 18.98 for [r] segment; $\bar{x}$ = 46.19 for [l] segment; $\bar{x}$ = 41.36 for [ɾ] segment) to the last ($\bar{x}$ =27.16 for [r] segment; $\bar{x}$ = 29.53 for [l] segment; $\bar{x}$ = 96.43 for [ɾ] segment). Each one of the oral assessments analyzed was represented with the lexical unit(s) found in the assessment texts. Both subgroups followed a relatively similar progression, independent of the segment, even though GA1 performed slightly better than GA2 only for segment [r]; however, considering their final accuracy rates for all segments, such small differences had no statistical significance between both subgroups ([r]: p = 0.918; [l]: p = 0.400 ; [ɾ]: p = 0.115).

Figure 1A. *GA Phonological accuracy rate / learning span for [r] segment*

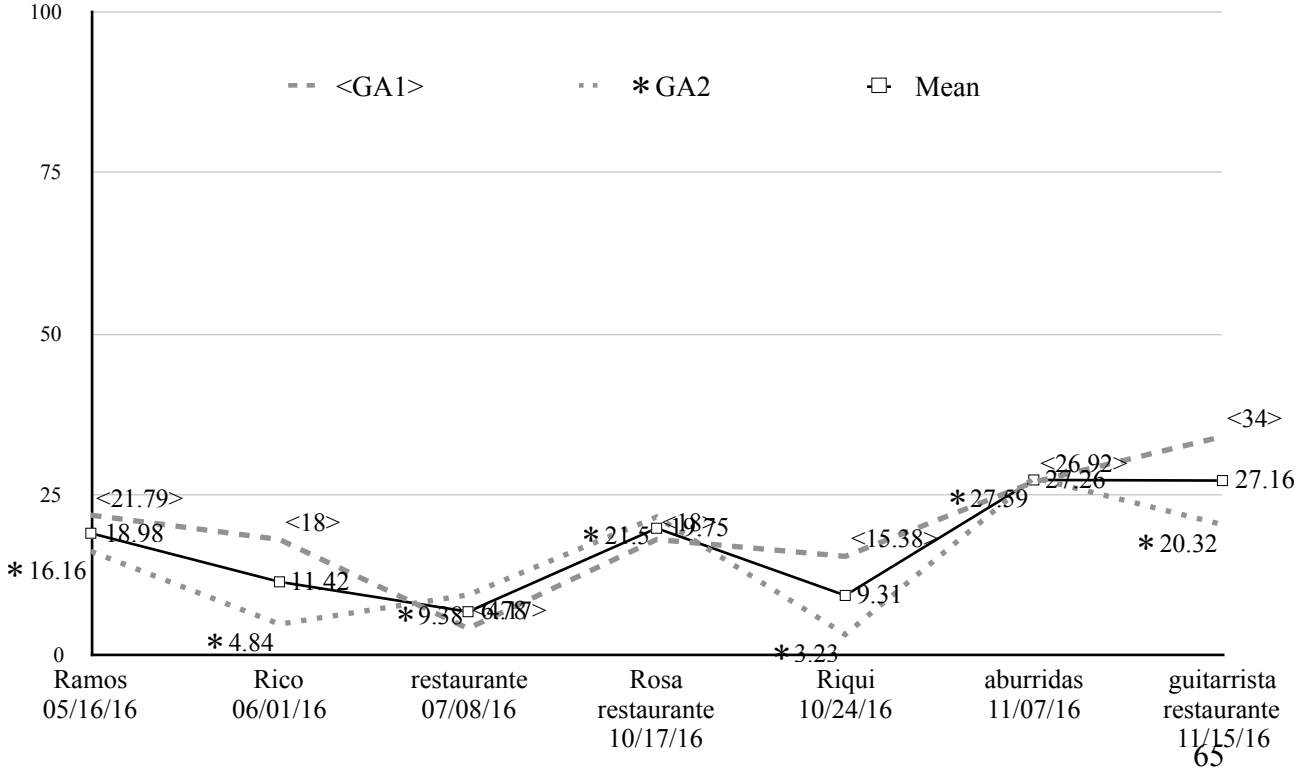


Figure 1B. *GA Phonological accuracy rate / learning span for [l] segment*

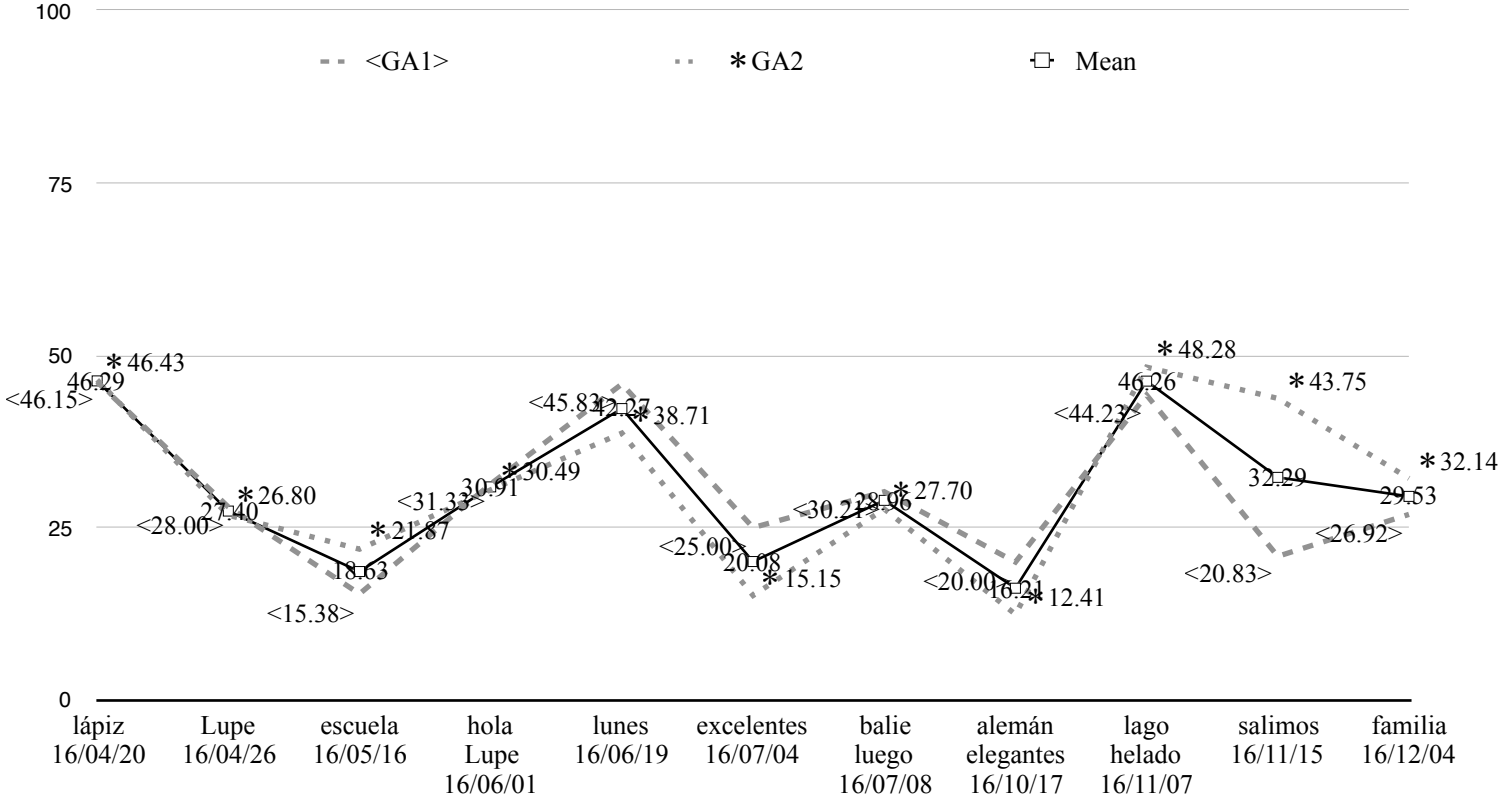
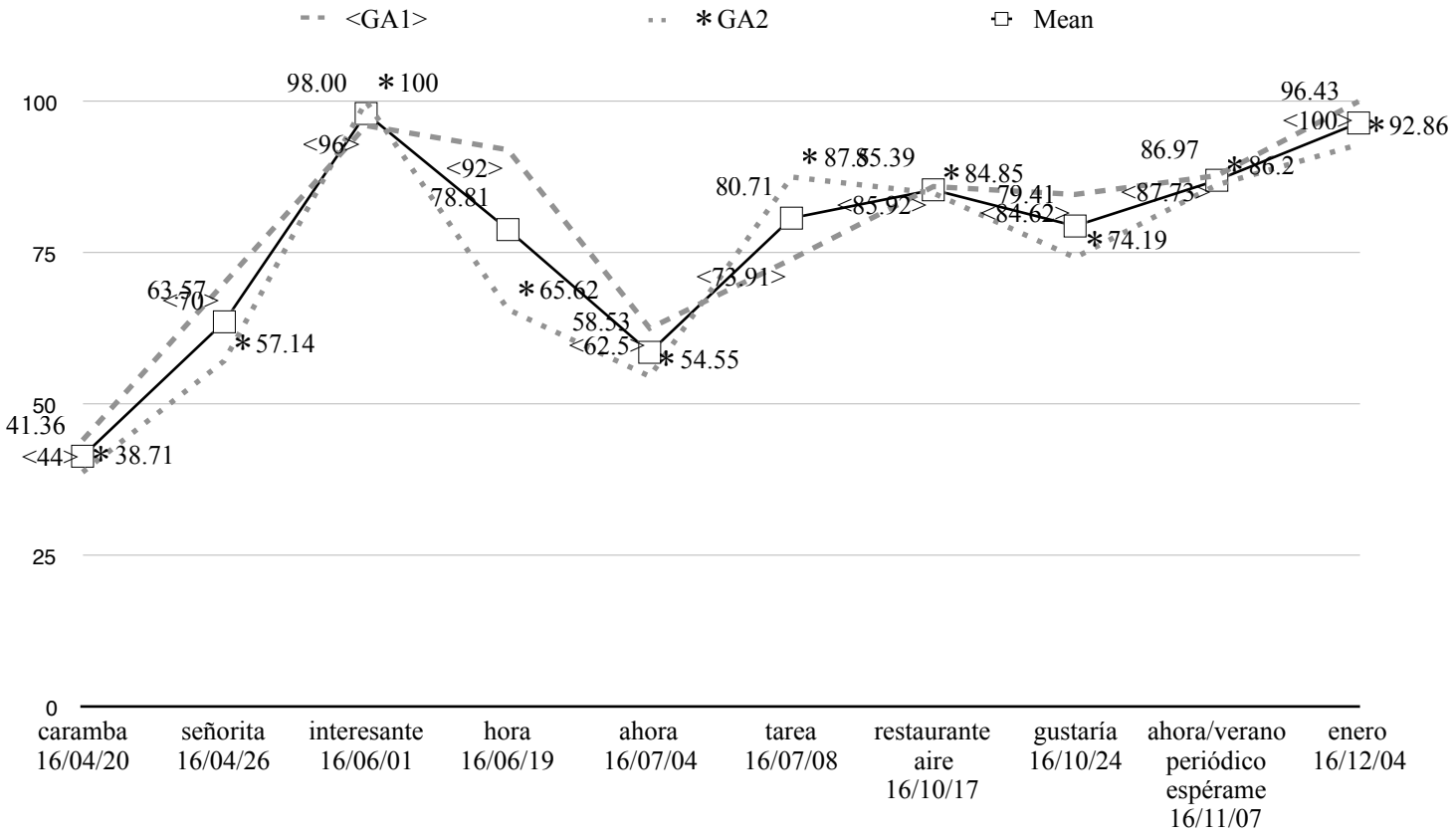


Figure 1C. *GA Phonological accuracy rate / learning span for [ɾ] segment*



As it is seen in Figures 1 (A, B & C), the improvement progression in the phonological accuracy rate for segment [r] is very low, no progression whatsoever for [l] and a significant improvement for segment [ɾ]; this is possibly caused by the similarity in phonological categories (point and manner of articulation) between the Spanish [ɾ] and the Japanese [ɺ], being both are alveolar flaps, which might give certain advantage to language learners in achieving the resulted phonological accuracy after the learning span, even without any PA training. Despite the difference in performance among the three segments, the rates showed a normal and sustained performance during the learning span for all segments, having only a few peaks above and below the average for the segment [ɾ] in the lexical units *interesante* and *ahora*.

Considering an individual achievement level (see Table 5), 30.51% of GA subjects could not utter the target segment [r] in any of the assessment sessions (inaccurate subjects). Moreover, there were no accurate subjects after the learning span. From the other 69.49% of subjects who could partially utter this target segment in at least one or more sessions, only a 36.59% was above its accuracy mean ($\bar{x} = 24.76$); in this regard, all subjects who could not utter the segment were discarded, because there was no accuracy involved whatsoever. In relation to gender distribution, there was no statistical difference in their phonological accuracy performance ($p = 0.190$). Finally, only an 8.18% of general accuracy improvement could be found for the segment [r] after the whole FL learning span.

Table 5. GA g*eneral and individual phonological accuracy rates*

Segm	Subgroup	General Achievement Mean		Initial Individual Achievement			Final Individual Achievement		
		Initial Assessments	Final Assessment	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)
[ɾ]	GA1	21.79	34.00	7.69	38.46	53.85	0.00	73.08	26.92
	GA2	16.16	20.32	3.03	24.24	72.73	0.00	66.67	33.33
	GA	18.98	27.16	7.69	38.46	53.85	0.00	69.49	30.51
[l]	GA1	46.15	26.92	11.54	53.84	34.62	0.00	100	0.00
	GA2	46.43	32.14	6.06	54.55	39.39	0.00	100	0.00
	GA	46.29	29.53	8.47	54.24	37.29	0.00	100	0.00
[ɾ]	GA1	44.00	100	30.77	53.85	15.38	11.54	88.46	0.00
	GA2	38.71	92.86	27.27	51.52	21.21	9.09	90.91	0.00
	GA	41.36	96.43	28.82	52.54	18.64	10.17	89.83	0.00

In regard to the [l] segment, there were no accurate nor inaccurate subjects after the learning span; all subjects (100%) were partially accurate and from them, only a 35.59% was above its accuracy mean ($\bar{x}$ = 30.31). Both subgroups performance varied widely during the learning span, and none of them surpassed the other's performance, except for the lexical unit *salimos*, where GA2 performed slightly better than GA1. In relation to gender distribution between the subgroups, there was no statistical difference in their phonological accuracy performance (p = 0.141). Segment [l] was the only segment which instead of showing an improve in phonological accuracy after the learning span, the general rate of accuracy decreased of 16.76%, taking into account the

first and final assessments of the process; the reasons for this decrease are unknown but might be related to the phonological consolidation of the segment utterance within the possible interferences found and the lack of phonological awareness in the identification and distinction of their other liquid counterparts.

As for the segment [ɾ], there were no inaccurate subjects after the learning span. However, 10.17% of GA subjects reached phonological accuracy after the learning span, and from the rest 89.83% of subjects (partially accurate), a 57.62% was above its accuracy mean ($\bar{x}$ = 78.13); this, being the highest achievement in phonological accuracy for GA in regard to the Spanish liquid segments. The gender distribution between the subgroups showed no statistical significance in their phonological accuracy performance (p = 0.131). In terms of general accuracy, the subjects showed the highest improvement of all the other segments, reaching a 55.07% of increase in accuracy between the first and last assessment of the term.

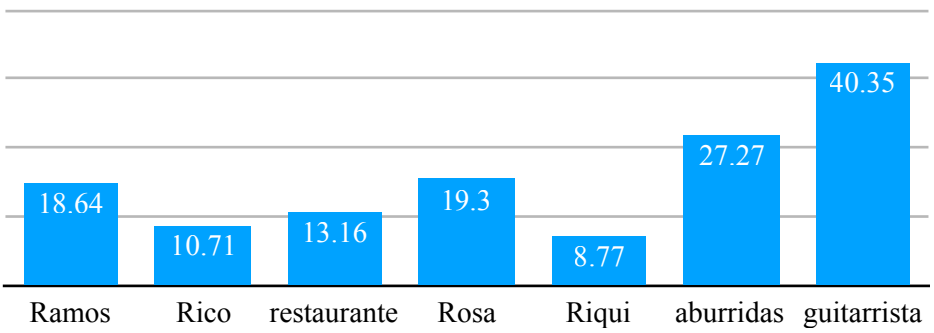
Breaking down the accuracy rates, for the [r] segment, the average articulatory accuracy rate reached $\bar{x}$ = 17.36, leaving a phonological interferences rate of $\bar{x}$ = 71.47, and other variables rate of $\bar{x}$ = 11.17. The rates for each of the interferences can be found in Table 6A. Unfortunately, there is not enough research on allophonic deviations of the Spanish [r] segment throughout Latin America and Spain to acknowledge the whole range of possibilities. However, some of the most known deviations were included in the articulatory accuracy ratio.

Table 6A. *GA rates of accuracy vs. rates of interference for [r] segment*

Segments Uttered	[ɹ]	[ɾ]	[r]	[l]	Other	Total Utterances
TOTAL	171	240	129	120	83	743
%	23.01	32.30	17.36	16.15	11.17	

[r] segment is normally found in initial position (like in *rosa* [ˈrosa]) or middle (like in *perro* [ˈpero]) position, but never in final position; however, when it is located in middle position, it graphemically appears (not including some exceptions, e.g. after n, s, or l) with the double grapheme 'rr'. It was possible to find a slightly better performance in lexical units with [r] in middle position, in the unit *aburridas* [aβu ˈriðas], with an articulatory accuracy rate of $\bar{x} = 27.27$, and *guitarrista* [gitaˈrista] with $\bar{x} = 40.35$ (Figure 2A), which could be comparable with the performance of the lexical units *guitarrista* and *restaurante* that appeared together in the same assessment script (Excerpt 2), but the accuracy ratio of the target segment significantly varied. Nevertheless, the data is not conclusive, due to the lack of more even utterances with initial and middle positions, so that further research needs to be carried out to analyze such phenomenon.

Figure 2A. *GA Phonological Accuracy / Lexical Unit for segment [r]*



Excerpt 2. Assessment Text Sample

Script 11

01 5. 3:00

02 Por la tarde comemos

03 si es posible en un **restaurante** al aire libre.

04 El muchacho que trabaja en el restaurante es muy guapo.

05 6. 7:00

05 A veces hay una fiesta en casa de un amigo.

06 Kati y Daniel bailan muy bien, ¿no?

07 7. domingo 11:00

08 Los domingos siempre salimos de casa

09 un poco antes de las once y vamos a la iglesia.

10 Después paseamos y comemos juntos.

11 8. 6:00

12 Por la tarde, mi amigo Martín me lleva a una discoteca. ¡Cuánta gente hay!

13 Me encanta esta música.

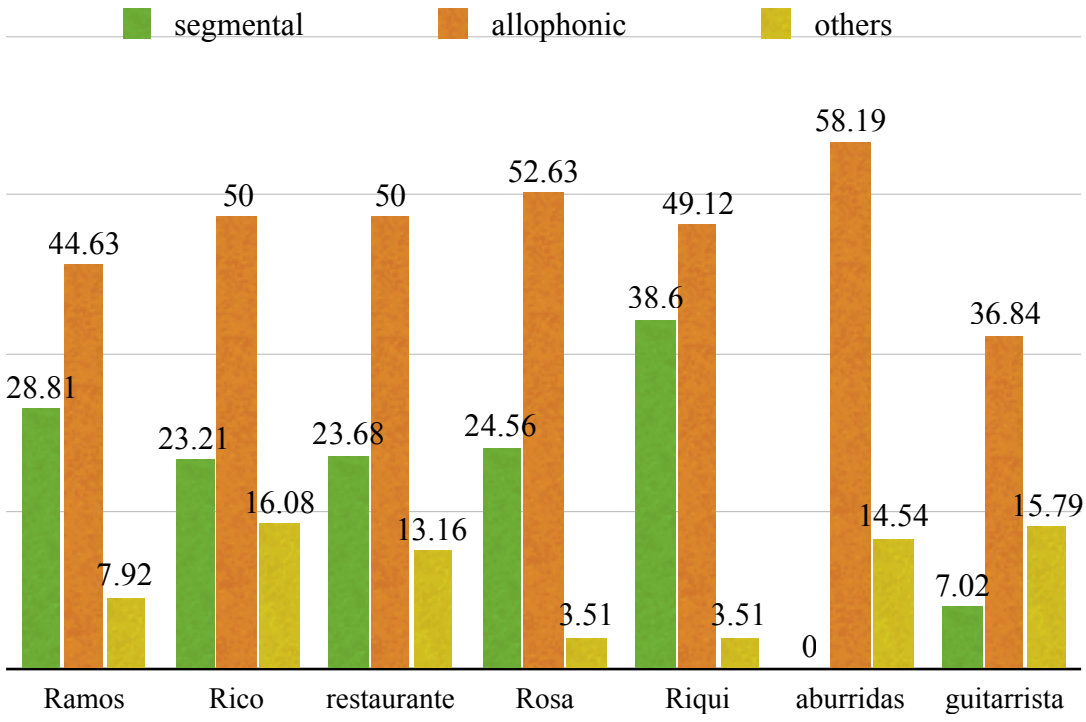
14 El **guitarrista** toca y canta muy bien.

15 Y ustedes, ¿qué hacen un fin de semana típico?

According to Altmann and Kabak's (2011) postulate of SLLs assimilating an L2 sound within a L1 sound, when not able to perceive distinctive categories in L2, the interference ratios per lexical unit (Table 6A) showed SLLs were able to perceive certain but not all distinctive features in the target segment, leading to the use of segments partially sharing such categories; so that [ɾ] and [l] almost prevailed over all possible other interferences. Allophonic deviations on such segments were reduced and categorized within the mentioned segments.

As for the phonological interferences per word (Figure 3A), most of the lexical units with the target segment [r] in initial position showed a very similar and normal variance within the group, being the allophonic interferences the most predominant; however, for the lexical unit *aburridas*, the allophonic interferences were a little bit higher than the average and it was the only lexical unit in which there were no segmental interferences. The allophonic interferences mean was $\bar{x}$ = 48.77, which give account of nearly the half of all utterances for the [r] segment.

Figure 3A. *GA Phonological Interference rates per word for [r] segment*



For the [l] segment, the average articulatory accuracy rate showed a performance of $\bar{x}$ = 30.04, which is significantly higher than the [r] segment, leaving a phonological interferences rate of $\bar{x}$ = 68.42, and other variables rate of $\bar{x}$ = 1.54. The rates for each of

the interferences can be found in Table 6B. In contrast with the segment [r] where the segment [l] was one of the two phonological interferences in the group, with a rate of $\bar{x}$ = 16.15 of the total of utterances, the allophonic interferences in this case were 100% attributed to the segment [ɾ] with an interference rate of $\bar{x}$ = 56.06; and the only other segment in the liquid repertoire, the segment [r], was no included due to its complete absence as an interference in this group.

Table 6B. *GA rates of accuracy vs. rates of interference for [l] segment*

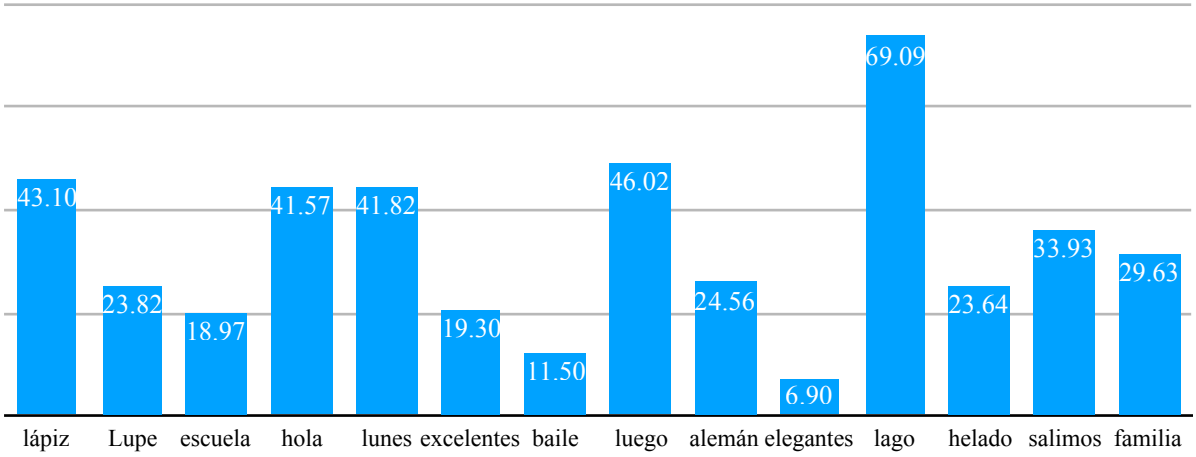
Segments Uttered	[ɹ]	[ɾ]	[l]	Other	Total Utterances
TOTAL	160	726	389	20	1295
%	12.36	56.06	30.04	1.54	

Even though [l] segment can be found in several word positions (initial, middle and final) in the Spanish syllabic structure, both in the onset and coda, only the structures CV and CVC were chosen for this study, due to the complexity and articulatory effort some other structures have for Japanese students, and due to the vowel epenthetic phenomenon occurring in consonants in final position. In order to avoid this phenomenon, all lexical units with compound consonant clusters and final position [l] segment included in the the assessment texts were discarded from the study, and only the most recurrent units (not all) were included.

It was possible to find a slightly better performance in lexical units with [l] in initial position (Figure 2B), like in the units *lápiz* [ˈlapis], *lunes* [ˈlunes], *luego* [ˈluego]

and *lago* ['lago], with an articulatory accuracy rate higher than the average ($\bar{x}$ = 30.99), being the latter the most prominent, with a rate of $\bar{x}$ = 69.09; the exception of the group was the lexical unit *Lupe* ['lupe], possibly due to its highest frequency (Table 2B) in the group. All the rest of units with the segment [l] in middle position did not show any common pattern, regardless of the neighboring vowels the segment adjoined.

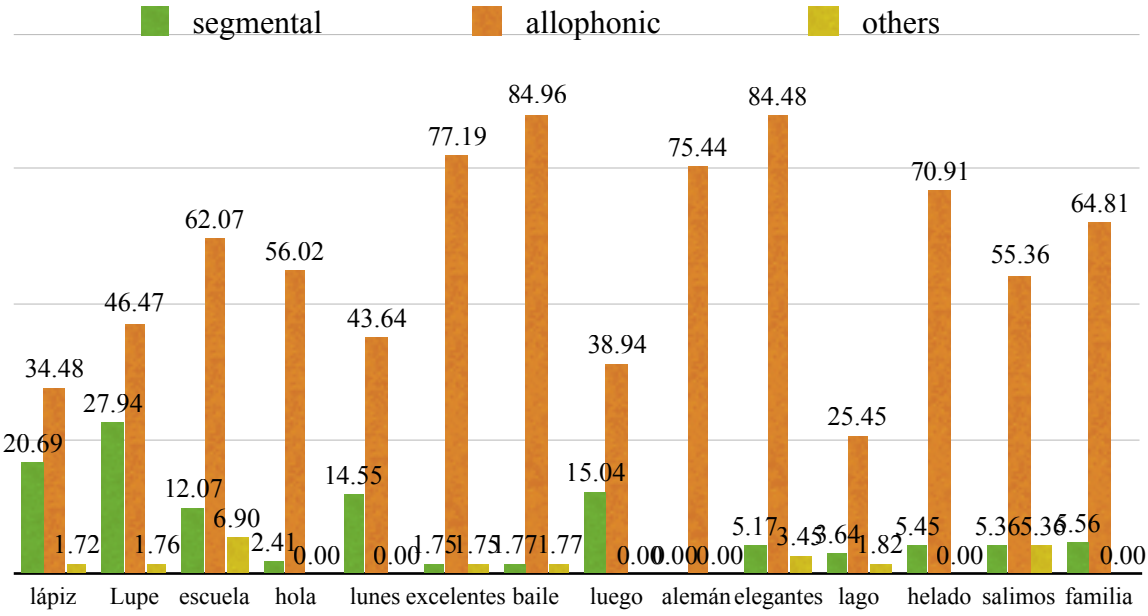
Figure 2B. *GA Phonological Accuracy / Lexical Unit for segment [l]*



In regard to the phonological interferences per word for segment [l] (Figure 3B), the predominance in all lexical units was the allophonic ones, represented by the segment [ɾ], with an interference mean of $\bar{x}$ = 58.59; however, as it is possible to see, in the units *escuela*, *hola* [ola], *excelentes*, *baile*, *alemán*, *elegantes*, *helado*, *salimos* and *familia* more than half of all utterances correspond to the allophonic interference. The few other interferences (at a rate of $\bar{x}$ = 1.54) were attributed to the approximant rhotarization of the liquid segment and very likely misreadings, even though at least 40% of the lexical units did not have any interference in that group. It is very important to highlight the frequency in which Japanese students of Spanish or other foreign

languages tend to assimilate liquid sounds into the [ɾ] segment, which is characteristic of Japanese speakers.

Figure 3B. *GA Phonological Interference rates per word*



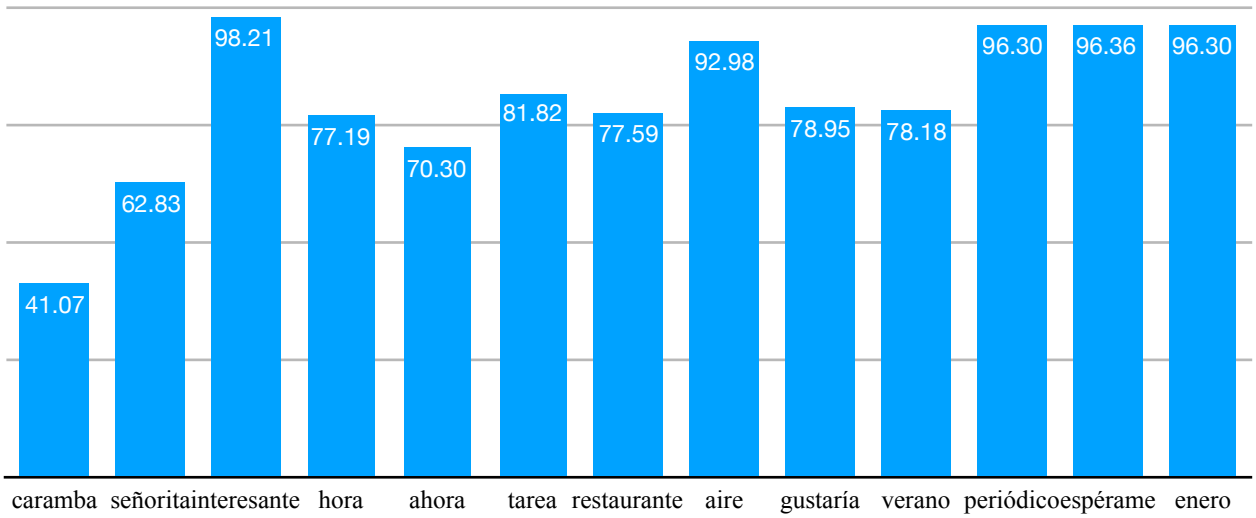
Finally, as for the [ɾ] segment, the average articulatory accuracy rate was $\bar{x}$ = 78.01, which was the highest in the group of liquids, leaving a phonological interferences rate of $\bar{x}$ = 12.78, and other variables rate of $\bar{x}$ = 9.21. The rates for each of the interferences can be found in Table 6C. Similarly to the segment [l], there was only one of the two phonological interferences in the allophonic group, attributed completely to to the segment [l] with an interference rate of $\bar{x}$ = 6.50; and the only other segment in the liquid repertoire, the segment [r], even though was present in the other variables group, only occurred in a $\bar{x}$ = 1.37 rate from all utterances; the rest of the $\bar{x}$ = 9.21 other variables rate, was attributed mainly to the approximant rhotarization of the segment [ɾ].

Table 6C. *GA rates of accuracy vs. rates of interference for [ɾ] segment*

Segments Uttered	[ɻ]	[ɾ]	[l]	Other	Total Utterances
TOTAL	58	720	60	85	923
%	6.28	78.01	6.50	9.21	

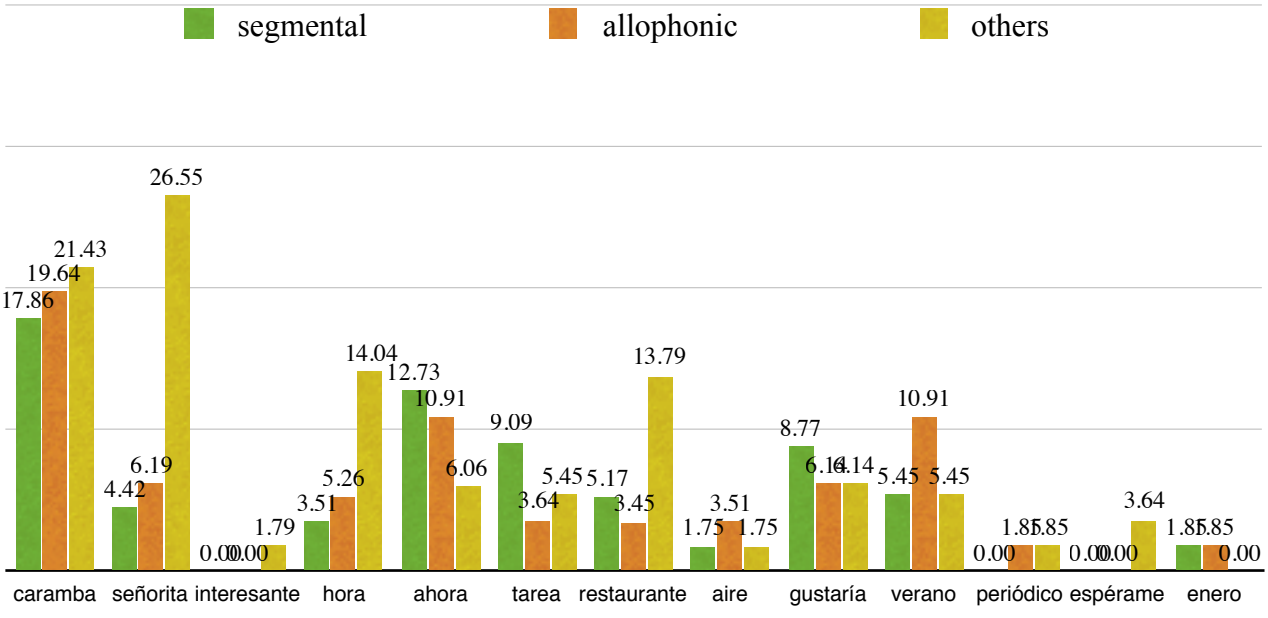
As all the lexical units for this study were intendedly chosen in middle position patterns, it is possible to observe a tendency in performance throughout the learning span (Figure 2C). It was expected that during the first assessments the students had a lower performance due to their first approach to the differentiation of the liquid segments and the phonological consolidation of the single tap; however, for the the rest of the units, the tendency prevailed. From the whole group, the units *interesante* [intere ˈsante], *tarea* [taˈɾea], *aire* [ˈaiɾe], *periódico* [peˈɾjoðiko], *espérame* [esˈperame] and *enero* [eˈneɾo] had a higher accuracy performance rate than the average ($\bar{x}$ = 80.62). Further research would be needed to analyze if the same tendency is found in lexical words with other syllabic structures or word positions.

Figure 2C. *GA Phonological Accuracy / Lexical Unit for segment [ɾ]*



Within the phonological interferences per word for segment [ɾ] (Figure 3C), there were different results than that in the other liquid segments, being the lowest rates of the group. There were no stable patterns found for this target segment and each of the lexical units presented differences in the interferences found. The segmental [l̴] and allophonic [l] interferences did not exceed a ten percent of all utterances each ($\bar{x}$ = 5.43 and $\bar{x}$ = 5.64, respectively), and the highest rate found corresponded the other variables rate ($\bar{x}$ = 8.30), which were mainly attributed to the use of the segment [ɹ] of slight rhoticity of the liquid segment. The units *interesante* [intere'sante], *periódico* [pe 'ɾjoðiko] and *espérame* [es'perame] did not show any segmental interference ($\bar{x}$ = 0), while the units *interesante* [intere'sante] and *espérame* [es'perame] did not show any allophonic interferences either; the unit *enero* [e'nero] was the only one which did not show any interference coming from other variables.

Figure 3C. *GA Phonological Interference rates per word for [ɾ] segment*



4.2 GB Results

GB was measured similarly to GA in terms of phonological accuracy before PA training (Table 7) and the rates were considered as the initial individual achievement; moreover, the results after the PA training were added as the final individual achievement. As expected, the general phonological accuracy rates, as well as the individual achievement rates, increased significantly after the PA training.

Table 7. *GB general and individual phonological accuracy rates*

Segm	Subgroup	General Achievement Mean		Initial Individual Achievement			Final Individual Achievement		
		Before PA training	After PA training	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)
[r]	GB1	12.90	74.19	3.23	35.48	61.29	70.97	9.68	19.35
	GB2	16.43	70.71	7.14	32.14	60.72	60.71	14.29	25.00
	GB	14.58	72.54	5.08	33.90	61.02	66.10	11.87	22.03
[l]	GB1	19.64	100	0.00	67.74	32.26	100	0.00	0.00
	GB2	38.81	100	0.00	89.29	10.71	100	0.00	0.00
	GB	29.10	100	0.00	77.97	22.03	100	0.00	0.00
[ɾ]	GB1	74.51	98.71	29.03	70.97	0.00	96.77	3.23	0.00
	GB2	60.37	98.57	7.14	92.86	0.00	96.43	3.57	0.00
	GB	66.22	98.64	18.64	81.36	0.00	96.61	3.39	0.00

For the [r] segment, the general phonological achievement followed the same tendency of GA ($\bar{x}$ = 14.58) before the PA training (see Table 8A). From the latter, 47.83% of subjects who could utter the segment in one or more of the assessments were

above this group's accuracy mean ($\bar{x}$ = 37.39). Only 5.08% of this group was phonological accurate in all the given utterances. Even though there was a different predominance in word position of the [r] segment, there was no statistical significance (p = 0.781) between GB1 and GB2 performance, considering their general phonological accuracy rates, $\bar{x}$ = 12.90 and $\bar{x}$ = 16.43, respectively. After the PA training session, GB general articulatory accuracy mean had a sharp increase, from $\bar{x}$ = 14.58 to $\bar{x}$ = 72.54, which translates into an immediate high significant impact on FL learners' phonological acquisition ($p < 0.001$). Moreover, there was no statistical significance comparing both sub-groups (GB1 and GB2), in regard to their accuracy performance (p = 0.701) and gender distribution (p = 0.103). However, by statistically comparing the accuracy rates before and after the PA training there was a high significant improvement in the subjects ($p < 0.0001$).

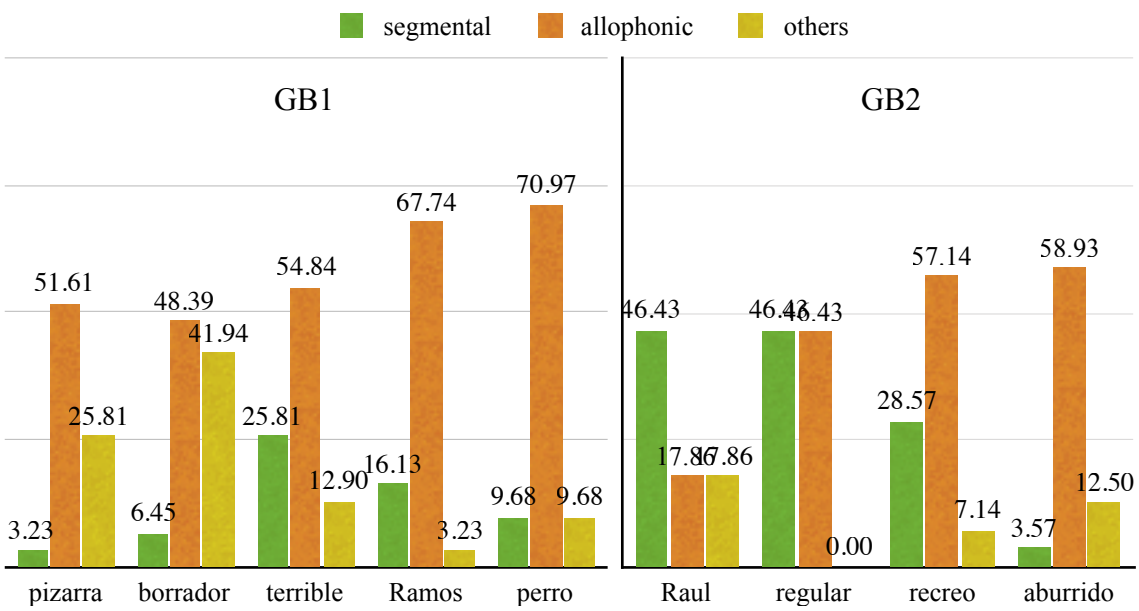
Table 8A. *GB rates of accuracy vs. rates of interference for [r] segment before PA*

Segments Uttered	[ɹ]	[ɾ]	[r]	[l]	Other	Total Utterances
TOTAL	52	116	43	41	43	295
%	17.63	39.32	14.58	13.90	14.58	

In regard to the articulatory interferences found before PA training for segment [r], the pattern followed also the same tendency of GA, being the allophonic interferences the most common ones ([ɾ]: $\bar{x}$ = 39.32; [l]: $\bar{x}$ = 13.90). Almost all the other variables, at a rate of $\bar{x}$ = 14.58, were attributed to the approximant rhotarization of the

target segment with the segment [ɹ]. Even though the sample of recorded material was smaller than the control group, as the learning span did not consider a training and post training assessment for GA, GB had similar results in regard to the articulatory rates. Furthermore, as seen in Figure 4A, in the interferences per word, the allophonic interferences surpassed all other ones in all lexical units; however, segmental interferences showed a higher rate in GB2 compared to GB1 (GB1: $\bar{x}$ = 10.32; GB2: $\bar{x}$ = 31.25). The sizes of the audio sample within each subgroup did not allow to make any comparison between different word position for segment [r]; however, the same tendencies per lexical units can be seen for GB.

Figure 4A. *GB Phonological Interference rates per word for [r] segment before PA training*



As for the [l] segment, this is the only segment in which there were no accurate subjects whatsoever in any of the two subgroups (see Table 7); most of the subjects

were placed at the partially accuracy rate (67.74% and 89.29%) with no statistical difference in their performance before PA training (p = 0.081). Both subgroups had a considerably lower initial accuracy rate compared to GA (GA1: $\bar{x}$ = 46.15; GA2: $\bar{x}$ = 46.43). However, this is also the only segment in which, after PA training, all subjects reached the maximum accurate rate ($\bar{x}$ = 100), leaving no inaccurate or partially accurate subjects, which translates into a high impact in regard to the improvement associated in the phonological accuracy of the learners (starting at a $\bar{x}$ = 29.10 rate). As both subgroups reached the highest accuracy rate, there was no need of comparing them in terms of accuracy performance and gender distribution; however, similarly to the other segments, a paired unilateral t-test result showed a highly significant improvement after PA training (p < 0.00001).

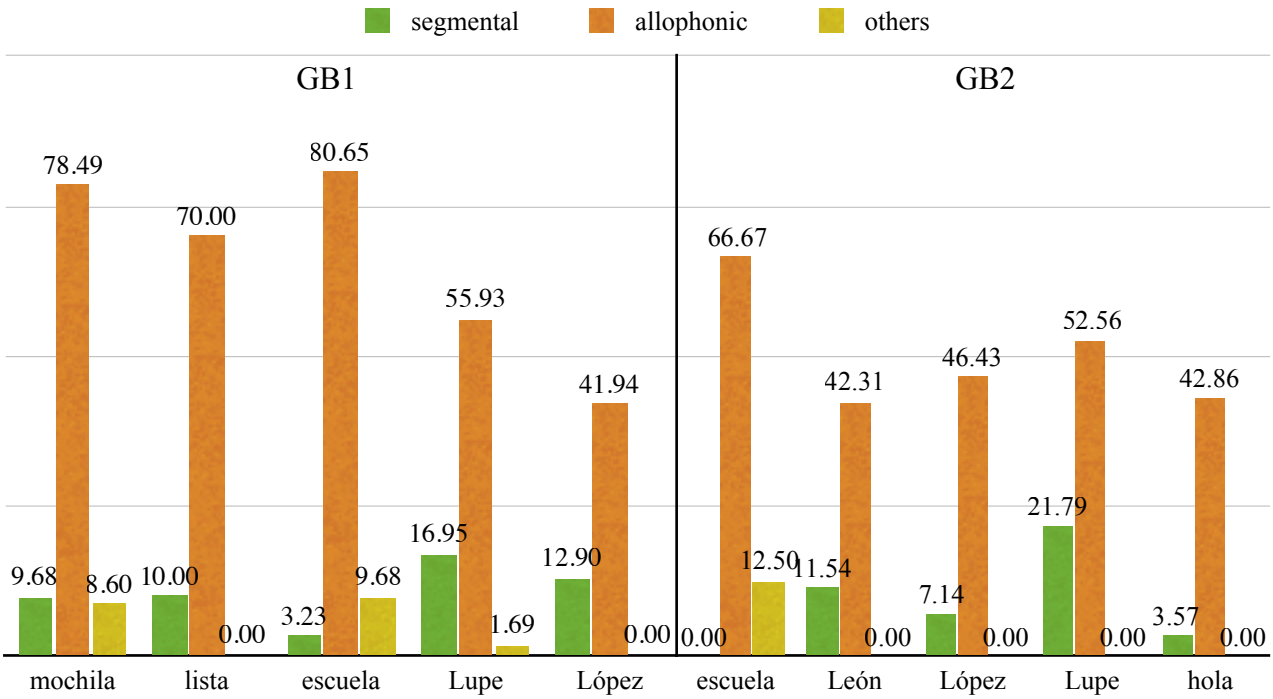
The articulatory interferences for segment [l] (before PA training) were centered mainly at the allophonic group and attributed to [ɾ] segment, with a rate of $\bar{x}$ = 57.09 (see Table 8B), and rates were almost identical to those of GA. The small other variables rate was basically due to misreading of the units and a couple other segments used instead of the target segments.

Table 8B. *GB rates of accuracy vs. rates of interference for [l] segment before PA*

Segments Uttered	[ɹ]	[ɾ]	[l]	Other	Total Utterances
TOTAL	60	310	158	15	543
%	11.05	57.09	29.10	2.76	

Even though the ratio of middle and initial position lexical words was 2:3, there was a slightly higher interference rate in the lexical unit with the target segment [l] in middle position (see Figure 4B), compared to the initial position ones, as the latter had a better accuracy rate per word for GB1 and GB2 (*lista* $\bar{x}$ = 20.00; *Lupe* $\bar{x}$ = 25.42; *López* $\bar{x}$ = 45.16 / *León* $\bar{x}$ = 46.15; *López* $\bar{x}$ = 46.43; *Lupe* $\bar{x}$ = 25.64; respectively), with the exception of the unit *hola* with the highest rate of all the lexical units in the group ($\bar{x}$ = 53.57), possibly due to the frequency and early stage this word appears during the learning span. Moreover, there were very few or none other variable interferences in lexical units with the segment in middle position.

Figure 4B. *GB Phonological Interference rates per word for [l] segment before PA training*



For the [ɾ] segment, even though there were no inaccurate subjects and the general achievement rate including accurate and partially accurate students was

considerably higher than the other two segments, with a general accuracy rate of $\bar{x}$ = 66.22 (see Table 8C), the number for partially accurate subjects (81.36%) moved almost totally towards accuracy (from 18.64% to 96.61% of subjects in the accurate rate) after PA training, leaving only 3.39% of subjects being partially accurate. Despite there was a significant statistical difference between the GB1 and GB2 subgroups in the accuracy performance before the PA training (p = 0.031), both groups reached a similar articulatory rate after the PA training (GB1: $\bar{x}$ = 98.71 and GB2: $\bar{x}$ = 98.57), with no statistical difference between them, both in accuracy performance (p = 0.942) and gender distribution (p = 0.960). Furthermore, a paired unilateral t-test showed the improvement occurred in GB, in regard to this segment, due to the PA training, was highly significant ($p < 0.0001$).

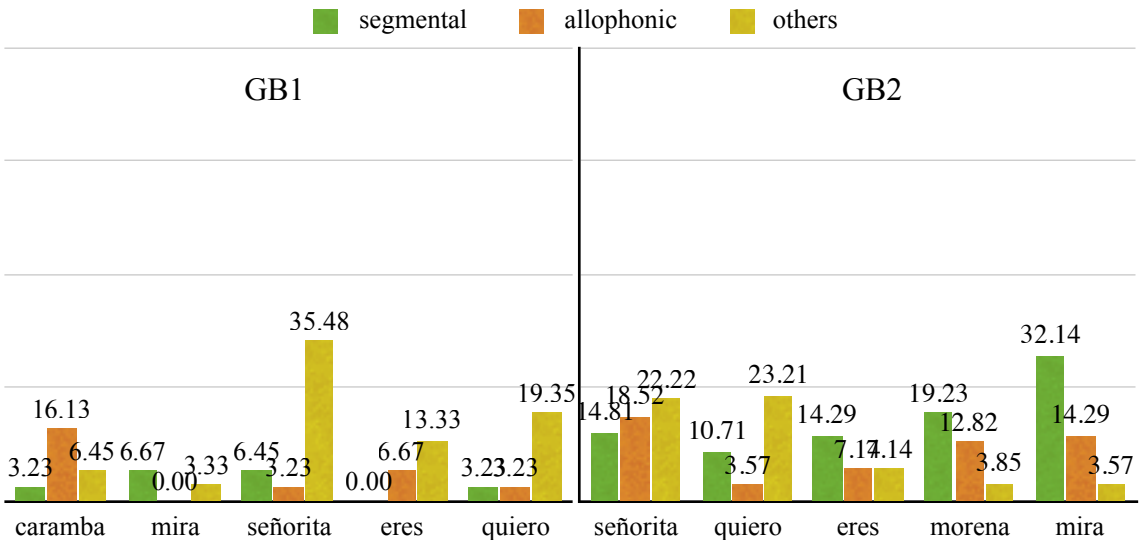
Table 8C. *GB rates of accuracy vs. rates of interference for [ɾ] segment before PA training*

Segments Uttered	[ɻ]	[ɾ]	[l]	Other	Total Utterances
TOTAL	44	245	32	49	370
%	11.89	66.22	8.65	13.24	

The articulatory interferences for segment [ɾ], as it was the segment with the highest phonological accuracy rate in the group, the number of interferences was significantly smaller compared to the other segments (with a total rate of $\bar{x}$ = 33.78). Even though there were no patterns whatsoever in the interferences in this group (see Figure 4C), it is possible to see that the other variables rate was in general terms higher

for GB1 and the segmental interferences (i.e. the [ɹ] segment) was the most predominant for GB2. As GB1 had a better accuracy performance compared to GB2, the rate of interferences per word was very low, with the exception of the lexical unit *señorita* with a rate of $\bar{x}$ = 35.48 (in the other variables group), the highest of the set. It was not possible to analyze different word position for the [ɾ] segment as it always appears in middle position or in consonant clusters; however the latter word position was not included in this study.

Figure 4C. *GB Phonological Interference rates per word for [ɾ] segment before PA training*



In regard to the phonological interferences of the segments for GB after the PA intervention, it is necessary to say that as the assessment was performed only once, the results are not conclusive in terms of the predominance along time of the interference improvement in respect to the previous analysis (before PA training). However, in order

to compare how the interferences were overcome after the PA intervention, Table 9 gives a summary of the accuracy and interference rates for all three liquid segments. In the table, it is possible to see the improvement of the rates if compared to tables 8A, 8B and 8C, and how students were able to clearly differentiate between the [l] and [ɾ] segments and improve significantly the accuracy of the segment [r].

Table 9. *GB rates of accuracy vs. rates of interference for all segment after PA training*

	Segments Uttered	Accuracy	[ɹ]	[ɾ]	[l]	Other	TOTAL Utterances
Utterances per segment	[r]	214	18	36	9	18	295
%		72.54	6.10	12.20	3.05	6.10	
Utterances per segment	[l]	295	0	0	n/a	0	295
%		100	0	0	n/a	0	
Utterances per segment	[ɾ]	291	4	n/a	0	0	295
%		98.64	1.36	n/a	0	0	

In summary, GA results showed that the was no major advance in terms of phonological accuracy of the Spanish liquid segments after a year of language training (considering the first and last assessments as initial and end points of achievement: [r]: from $\overline{x}$ = 18.98 to $\overline{x}$ = 27.16; [l]: from $\overline{x}$ = 46.29 to $\overline{x}$ = 29.53; [ɾ]: from $\overline{x}$ = 41.36 to $\overline{x}$ = 96.43), with the exception of the segment [ɾ], in which there was an important improvement, even though in general terms (i.e. the overall accuracy rates), the complete accurate subjects were only 10.17%. In this way, it is noticeable that a

traditional language training program with no goal or focus on pronunciation does not support students in developing phonological awareness skills that are necessary to acquire the enough phonological competences to reach language proficiency and, in this case, be able to distinctively distinguish among the three liquid segments.

In terms of the phonological interferences found in this group, the general rates were significantly high, at least in two of the liquid segments ([r]: $\overline{x}$ = 82.64; [l]: $\overline{x}$ = 69.96; [ɾ]: $\overline{x}$ = 21.99), considering there was one year of language training. The most common interferences were allophonic (with the exception of the segment [ɾ], where the highest rate was from other variables), which means that there were no phonological differentiation between liquid segments and, therefore, the necessary phonemic awareness skills where not properly develop in the students within the FL learning span and will need further follow up to improve this language impasse, as the no differentiation of these segments could lead to mispronunciations and, in consequence, miscommunication.

In the case of GB, the results after the PA training showed there was a significant advance compared to the initial assessment (considering the general rate before PA training and the assessment after PA training as the points of achievement: [r]: from $\overline{x}$ = 14.58 to $\overline{x}$ = 72.54; [l]: from $\overline{x}$ = 29.10 to $\overline{x}$ = 100; [ɾ]: from $\overline{x}$ = 66.22 to $\overline{x}$ = 98.64); even though for the [ɾ] segment, the initial rate was importantly higher than the other segment in the assessment before PA. Therefore, it is possible to evidence how a simple PA intervention session can influence the development of phonological skills in learners

and improve the utterance outcomes, which translates into better oral proficiency in a long-term basis, if the instruction continues alongside the language learning process.

In regard to the phonological interferences for GB, as seen in table 9, the improvement of the learners in overcoming the interferences that were present before the PA training was significantly high in all segments. The rates show that students achieved phonological differentiation between the liquid segments, allowing them to perceive and use the segments properly for a successful deliver of the communicational goals they intend and will be exposed to in the future. The segment that displayed more difficulty was the segment [r], where the rate of interference remaining was of $\overline{x} = 27.46$ coming mainly from allophonic influence. This means that students require further training in this segment and a proper follow up to achieve such phonological goal. However, that result was expected as described in chapter 2, where it was stated that even native speakers take a longer time in acquire the alveolar trill sound.

Comparing the results for GA and GB, the significance of PA training was demonstrated and how it can affect the phonological accuracy of Spanish FL learners (final rates for GA, under the traditional, not explicit PA training paradigm: [r]: $\overline{x} = 27.16$; [l]: $\overline{x} = 29.53$; [ɾ]: $\overline{x} = 96.43$; and for GB, under active methodology, PA training intervention: [r]: $\overline{x} = 72.54$; [l]: $\overline{x} = 100$; [ɾ]: $\overline{x} = 98.64$). The use of active learning methodology also had an important impact in the students as the traditional teaching model (passive methodology) did not achieve the phonological goals within one year of learning; even though it achieve an important improvement for the segment [ɾ]. In contrast, using active learning methodology, students were able to engage in their

learning process and acquire the require skills in a short time, using the opportunity to not also understand and absolve the knowledge but also to put it into practice, both improving their phonological accuracy and overcoming possible interferences for the liquid segments.

CHAPTER V

DISCUSSION

When learning a foreign language, it is highly important to acquire acceptable pronunciation, as bad pronunciation habits are not easily corrected. According to Kelly (2002), learners who always mispronounce a series of phonemes often find themselves having serious problems in understanding and being understood by speakers of other languages. This can be very disappointing for those who have good grammar and lexis knowledge and might put under risk their learning acquisition process due to a decrease in learners' motivation. Morley (1991) also stated that understandable pronunciation is a necessary part of communicative competence and, without having acceptable pronunciation skills, learners would not be able to communicate effectively. This is one of the key factors to be considered when it comes to measuring success in foreign language acquisition.

Over the last decades, research has mainly dealt with the contribution of phonological awareness to reading acquisition, rather than pronunciation itself. However, the relationship between phonological awareness and reading is not unidirectional but reciprocal in nature (Stanovich, 1986). Smith *et al*. (1998) concluded that phonological awareness can be developed before reading and that it facilitates the subsequent acquisition of reading skills.

The American National Reading Panel's (2000) report shows that teaching students to identify phonemes in words was significantly effective under several types

of teaching conditions and students; also, that students' reading skills drastically improve when learners, from a wide range of ages, are exposed to PA compared to instruction that lacks any attention to PA. Moreover, the report affirms that the effects of PA instruction lasted well beyond the end of PA training. Nevertheless, the researchers at the panel argued that PA training does not typify a complete reading program, it only gives learners the essential knowledge about the sound system of the language being learned and its link to the graphemic representation, as a single component of a broader language (or reading) program; several other competences need to be developed in other to achieve certain degree of language proficiency. Finally, the report establishes that there are multiple ways to teach PA effectively, teachers need to assess the methods they use against measured success in their own students; and of course, that it is important to consider the motivation of both, the students and the teachers, as a critical ingredient of success.

Whether it is throughout a reading practice out load or in groups, or in any other activity involving oral production, it is necessary to proceed to the explanation, practice and correction of the errors, once instructors have foreseen, identified and isolated them. Once those pronunciation errors have been identified, it is necessary to implement a system or methodology to help students overcome such phonological difficulties. For this, Bueno (2013) suggests to resort to different strategies: imitation, demonstration, association, explanation, articulatory methods, minimal pairs, hearing and imitation, verb-tonal system, among others; it is also possible to apply a simple to complex approach, that is to address smaller phonological structures and escalate towards more

complex structures: vowels → diphthongs → triptongs → vowel sequences in contact → consonants → consonant clusters → accent → intonation, and so on; or the other way around, from complex to simple, that is: intonation and rhythm → individual sounds; all in all based on the learners needs and learning goals.

Some of the difficulties that instructors might find is related to the similarities or differences between segments in two phonological systems. In general terms, and in the field of the segmental elements of languages, it seems reasonable to say that individual sounds that are equal or practically equal in L1 and L2 do not present much difficulty, as it is the case of [s] in *eso* (in Spanish) and [s] in その /sono/ (in Japanese); moreover, that the sounds, on the other hand, that do not exist in the L1 of the student's phonological repertoire, such as the sound [r] in *rosa* (in Spanish), could end being mastered with more or less effort and practice; and, finally, that those elements that share more distinctive features are those that tend to create more problems, such as, for example, the [f] in *faro* (in Spanish) and the [ɸ] in ファイト /ɸaito/ (in Japanese). In many cases, errors (very possibly due to interferences) will impede communication; in others, they will hinder it and, in others, they will simply be acoustically alien to native production. It will be the language instructor, according to the relevance of the errors, who must decide how to classify and deal with each of them. The errors can, on the other hand, have a phonological nature, *pero* [peɾo] instead of *pelo* [pelo]; and in other, some phonetic cases, *fuego* [ɸuego] (in Japanese accent) instead of *juego* [xuego].

In the case of Spanish teaching, and considering the purpose of this research, Trubetskoy's (1969) 'phonological filter' theory, briefly described in chapter 1, would

suggest that the subjects in this study, being all Japanese native speakers, would be most likely to be unable to perceive, identify or differentiate between liquid segments (Goto, 1971; Mochizuki, 1981; MacKain *et al.*, 1981). This based of the fact that Japanese language has only one liquid segment and Spanish owns three and, therefore, Japanese speakers will tend to unify the perception of those sounds into their only single known utterance.

However, as shown in this research paper, after PA training most of the (GB) subjects were able to distinguish between the phonological features of the liquid segments, in concern of the reading/pronunciation skills surrounding PA. Furthermore, it is also possible to notice how significant the impact of PA training was when comparing GA and GB's accuracy means (Table 10). Although both groups started in a very similar articulatory rate, the line progression of phonological articulatory improvement of the target segment is consistent with the results found, considering that there was only a single PA intervention during the process. Therefore, comparing the accuracy improvement means, the null hypothesis of phonological improvement in a natural FL environment during the learning process is rejected ($p < 0.001$), except for the case of the segment [ɾ], where the control group performed closely enough to the trained group. This is possibly because the Japanese liquid segment and the [ɾ] segment share most of their phonological features and are close in pronunciation, compared to the other two segments. Moreover, even though GA final accuracy rate improved significantly over the learning span for the segment [ɾ], the rates of accurate subjects for this segment was considerably low compared to GB, most of subjects were placed only

in the partially accurate group, which reflects the development and settlement of the aimed phonological skills. Nevertheless, if we consider the two other segments ([r] and [l]), it is possible to prove that phonological training needs to be included within the FL learning span in order to achieve the phonological goals both, teachers and learners, have set in the process.

Table 10. *GA vs GB phonological accuracy rates*

Segm	Subgroup	General Achievement Mean		Initial Individual Achievement			Final Individual Achievement		
		Initial	Final	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)	Accurate subjects (%)	Partially accurate subjects (%)	Inaccurate subjects (%)
[r]	GA	18.98	27.16	7.69	38.46	53.85	0.00	69.49	30.51
	GB	14.58	72.54	5.08	33.90	61.02	66.10	11.87	22.03
[l]	GA	46.29	29.53	8.47	54.24	37.29	0.00	100	0.00
	GB	29.10	100	0.00	77.97	22.03	100	0.00	0.00
[ɾ]	GA	41.36	96.43	28.82	52.54	18.64	10.17	89.83	0.00
	GB	66.22	98.64	18.64	81.36	0.00	96.61	3.39	0.00

One of the main difficulties in the phonological competence while speaking or reading is the inability of processing speech sounds in the language being spoken or learned. This kind of impediment hinders severely the development of not only the oral skills (pronunciation and fluency, specifically) but also the listening comprehension of the students, which is difficult to improve in later stages of the learning process if the fundamentals of the language system (i.e. the phonological inventory) has not been

properly trained and developed (Fletcher e*t al*, 1994). Phonological awareness instruction and interventions are aimed for facilitating the acquisition of reading skills and, in a broader extent, of writing skills, i.e. decoding words and spelling words. Proficient decoding is key for learners in order to comprehend what they are reading (Scheule & Boudreau, 2008) and other speakers of the language. Liberman *et al.* (1974) assure that phonological awareness is important to understand the alphabetic background that underlies the system of any language. Learners need to be aware of the internal structure of words so that they can benefit in other language formal instruction; this being applied to reading or other language areas.

This study includes only one single 20-minute PA intervention session, as described in the methodology chapter (chapter 3), due to the availability of resources and intervention access to the subject groups; and focused on the immediate phonological response of such intervention. However, in optimal conditions, the National Reading Panel (NICHD, 2000) suggests that 5 to 18 hours of instruction/ intervention gives substantial improvement to the learners' phonological awareness skills, and longer programs not necessarily translate into a better benefit. On the other hand, Ball & Blachman (1991) debate that traditional intervention programs that have been carried out over 7 to 12 weeks, with 3 to 5 sessions per week, 15 to 30 min in length, had shown significant improvements in the PA of learners. Unfortunately, there is no extensive and well documented research in the intervention of university students as for comparing the results of this study with other long-term programs with a more systematic intervention aim.

When it comes to understand and explain the phonological path learners need to go through in their journey to become phonological proficient, Bernhardt and Stoel-Gammon's model seems to satisfy the necessary background for instructional PA; however, this model is intended to interpret the development of phonological skills in young learners, in respect of their L1 and, therefore, most of the PA methodology is based in a phonological hierarchical processing instruction, with most of its activities designed to address the initial stages of the model.

Nevertheless, the model can also be applied to unfold the phonological evolution in acquiring a foreign language, where it would be important to add a more systematic and reflective (metacognitive) instructional approach for adult learners, taking into account the continuum view (Phillips *et al*., 2008; Anthony *et al*., 2003) of the model, where the methodology to be chosen will depend on the learners' phonological needs, rather than an unidirectional pathway.

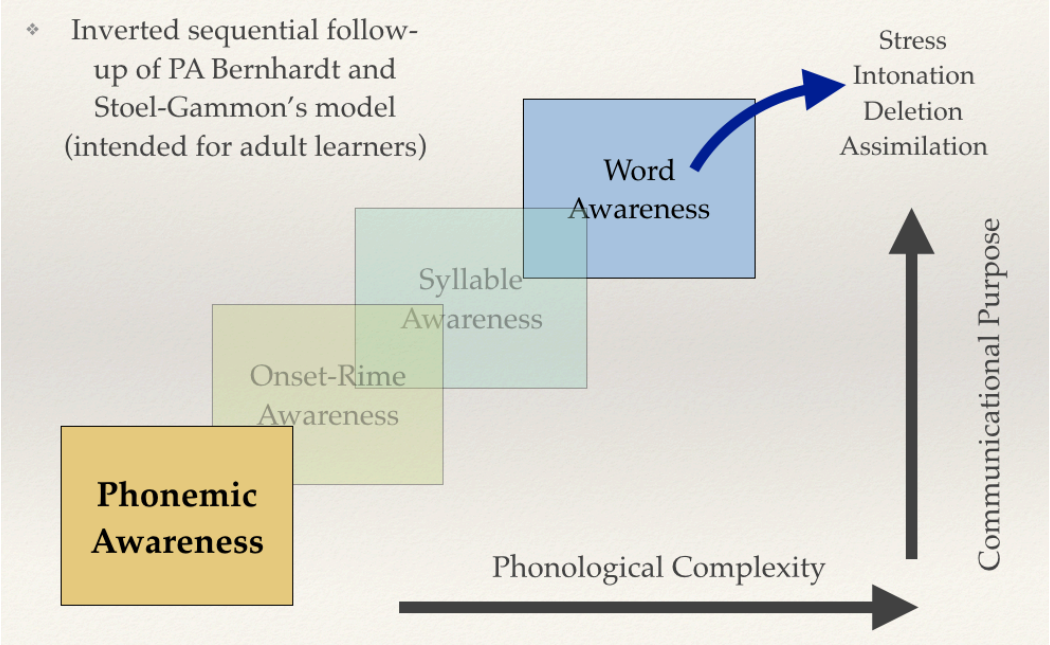
Furthermore, Bernhardt and Stoel-Gammon's model is the base of PA intervention in early stages of L1, mainly during the learners' literacy process in kindergarten and elementary school; however, there is not enough research of how this model can be applied into the phonological acquisition process of adult subjects. Adult FL learners start their language learning process for various reasons but, at this stage, they might convey mainly into communicational purposes. Smith *et al.* (1998) affirm that the degree of explicitness and the systematic nature of phonological awareness instruction will vary according to the learner's skills; therefore, instructors have to

continuously adapt their methodology and curriculum to their learners' needs, both throughout the learning process, as well as for different learning groups.

Thus, and taking into account the impact PA training could have based on this study results, this research paper intends to provide a revision the traditional PA acquisition Bernhardt and Stoel-Gammon's model and suggest an adaptation towards adult learners under a FL learning program at university level. The traditional pathway suggests that learners should start studying and breaking down more complex phonological structures into smaller ones: word → syllable → onset-rime → segmental. This model has been used and proved to be successful along time in regard to younger learners, focusing on phonological acquisition to develop reading skills; also, its acquisition pathway seems to have a greater effect into this age range learners within the acquisition of their L1 or a parallel L2, as the cognitive processing and the complexity of the phonological units and activities proposed match the age range of those learners.

However, in order to make this model work and satisfy the linguistic needs of adult learners, an inverted sequential follow-up of the aforementioned model is proposed (see Figure 5); starting sequentially addressing the levels in an ascending order, from segmental → onset-rime → syllable → word → syntactical structures, within the methodological planning of the learning process. As university students own high cognitive processing skills, they are able to analyze information and handle complex tasks when required, as it is, for instance, the segmenting or blending of segments in a word unit or the articulatory process of a given segment in the speech mechanism.

Figure 5. *Proposal of the Bernhardt and Stoel-Gammon's phonological acquisition model inversion.*



Japanese and Spanish are phonological languages and their sound systems share several segments. In this way, the understanding of how smaller/simpler units (segments) work will make it easier for students to process this knowledge at an initial stage. It seems more logic having the model backwards, because this fundamental knowledge may help understand the rest of the levels, and it might fit the natural processing of language learning students had while learning their L1. Phonological phenomena such as intonation, assimilation, stress among others, require a longer time and more phonological contextual understanding that usually is acquired through long experience and contact with a FL; thus, the horizontal axe of the inverted model shows the 'phonological complexity' in such terms. Finally, the vertical axe of the inverted model shows the use that each one of the levels represents under a communicational

approach, which means that the more complex the phonological structures get, the more communicational functionality it will give learners to increase their language proficiency.

According to the CEFR, students should be able to develop a phonological competence which includes the understanding and use of FL phonemes and their particular contextual realizations, and all their distinctive features (i.e. becoming phonological accurate); in order to achieve this, a large variety of instructional methodology, including explicit phonetic training, should be provided to (FL) language learners (Piccardo, 2016). Also, phonological competence does not only include sounds in particular, but a sequence of phonological development from smaller or simpler structures to more complex ones, which require more attention, time and instruction.

There is some research as well on how PA has impact in learners' phonological accuracy regardless of the other levels and difficulty of language processing. "PA training has been shown to have an impact on tests of PA and pronouncing words in isolation" (Krashen S. & Hastings A., 2011), even though they did not show any improvement in reading comprehension in L2; therefore, there is the need to implement enough methodologies to make it happen, scaling up from the smallest linguistic level to the ones with more cognitive complexity. Nevertheless, in this matter, it is important to make a distinction between 'reading competence' in terms of the de codification involved between the graphemic representations of the language and the implicit phonological segments associated to them, and 'reading competence' in terms of the

cognitive mechanism associated to speech analysis and semantic comprehension, as PA is only associated with the former and not with the latter.

Finally, Gatenby (1956) sustains that, at the adulthood stage, learners have already lost the ability to "hear, identify, imitate and remember groups of human sounds" and, therefore, are more likely to learn a new language in a more intellectual and explicit way. That is one of the main reasons understanding and following a phonological acquisition model including this systemic phonemic-explicit approach would improve learners' phonological capabilities in learning any foreign language.

In this way, this research paper gives an important view point in relation to the teaching practices and methods used toward the training of phonological skills in a FL learning program. If instructors take the necessary care and time to design the right activities and lessons, including a phonological component in the curriculum, the impact it will have in the learners' proficiency skills will be much higher than when there is none. Research has shown that early phonological instruction can benefit students in their language skills, whether they are within articulatory or pronunciation matters or in other language areas, such as reading or spelling (Bus & Van Ijzendoorn, 1999; NICHD, 2000; Angiulli *et al*, 2004; Ehri *et al*, 2001).

Furthermore, this paper gives a general description of the phonological interferences produced while learning liquid segments, based on Japanese language as L1 and Spanish as FL. From it, it is possible to overview the systematic challenges students with a given phonological background will face when acquiring segments not contained in their phonological repertoire. This data provides a deeper understanding of

how the phonological phenomena occurs and, therefore, methodological remedial measures could be taken in order overcome such difficulties. PA instruction is one of this measures and, through it, this paper shows how systematic PA intervention can support students in facing the aforementioned challenge (even though the limitations of this paper reached the analysis of a single PA intervention session). Finally, the same methodology can be applied to any other set of languages and the knowledge provided by such future research will widen the range of understanding of the phonological acquisition processes of a foreign language and enhance the possibilities of overcoming several possible FLA difficulties, not only phonological terms but also in other linguistic areas as well.

CHAPTER VI

CONCLUSIONS

Foreign language acquisition involves a series of linguistic skills and knowledge every students is challenged to learn in regard to any language. One of those skills involves the acquisition of phonological structures of the target language and all the phonological phenomena associated to them. Unfortunately for learners, this is one of the areas most teachers avoid and do not spend time developing within the students' learning process, causing a wide range of phonological difficulties in learners that are very likely to remain along higher levels of language proficiency.

Most instructors rely on the belief that being exposed enough to a FL will develop certain phonological skills and that most of students will achieve such a goal automatically. Even though this premise could be partially true, and that language exposure can significantly help students improve in regard to phonological performance, it does not guarantee students will be phonological aware and competent of the new phonological system involved in the new language and all its particularities. Therefore, most students without proper phonological training lack enough phonological knowledge and are not able to make up for the challenges they will face along their learning, leaving gaps they usually fill with their own phonological system and, consequently, creating several impediments in terms of oral communication; this includes misunderstandings, severe foreign accent, inability to read, among others.

Phonological Awareness is a key skill that helps to develop phonological competence and a series of other linguistic skills, such as speaking, reading and even writing (spelling). Research in phonological awareness intervention has given important

insights in the impact it has into the development of the communicational goals for both, the learners and the instructors. There are also enough studies on the general efficacy of PA instruction and intervention, setting conclusive proof that learners' phonological competence can be improved through this mechanism and also enhance other linguistics competences, such as word decoding and reading fluency (NICHD, 2000).

The results of this study contribute to the future use of phonological awareness measures in both research and educational settings and also it gives a brief view of the articulatory processing involved in acquiring the Spanish liquid segments, considering Japanese as L1. Most of the methodologies used in a university setting are based in a traditional paradigm of teaching and do not include a phonological item in the course syllabi, in respect of a FL learning program; hence this paper gives a clear example of the potentiality that this kind of training can have in the performance and improvement of linguistic skills in university students, both in terms of the phonological component of the training and also in the methodology applied within the training, which, as a whole, boost the learners' linguistic capabilities and help achieve the instructional goals set in the language program. Also, the study shows, by comparing the results of a traditional setting with PA intervention training, the level of phonological competence students could acquire under the traditional paradigm and the efficacy of it, in terms of the acquisition of foreign segments inexistent in the L1 phonological repertoire (e.g. the Spanish liquid segments in a Japanese-as-L1 environment, as to this case).

In regard to the PA training, the role of the instructors does not only rest upon identifying phonological difficulties in FL learners; as, by doing so, it does not really

translate into an immediate and significant improvement in learners' oral skills; however, finding the key areas where students lack PA can help instructors prepare the necessary methodology and instructional material to overcome those phonological impediments or challenges. PA instruction effectiveness will deeply depend on the necessary knowledge of instructors, not only in what to teach and how to teach it, but also in what are the phonological constituents surrounding a certain group of learners, such as students' L1, phonological contrast between L1 and the target language, previous FL learning, learners' former PA instruction, and so on (Kelly 2000). If instructors take into account the level of phonological accuracy they want their students to acquire, they will need to adapt their lessons in a way PA can be a guide for learners to develop the necessary communicational skills for every day conversation in the FL being learned.

It is well known that the more students learn pronunciation (i.e. acquire phonological skills), the more competent they will become in regard to the target foreign language communicational skills. Moreover, PA will boost language coding skills and it will definitely impact the success of students' language acquisition in varied linguistic areas. Nevertheless, PA does not represent the linguistic competence by itself; learners could achieve an impeccable pronunciation of isolated sounds, perfect rhythm and flawless fluency in their FL, but it will certainly not constitute an effective communication. The delivery of ideas and socio-communicative aspects are covered in other areas of language that should never be neglected (Morley, 1991).

In this respect, the main goal of instructors should not be exclusively to improve phonological accuracy so that learners strictly lose a possible accent and acquire native

pronunciation; but, through instruction, promote the communicative aspect of what needs to be learned within the required phonological skills so that students can effectively and accurately deliver in their foreign language. Setting these goals and interconnecting them with the rest of linguistic skills in a classroom setting will assure the correct and holistic development of students' skills, which is what all language programs aim for.

One of the advantages of teaching young adult (university-level) learners is that it is possible to make subjects analyze the structure of the target language and the articulatory mechanisms involved in the utterance process of a given phonological unit, such as an isolated phoneme, a syllable, a word, a phrase or even a bigger unit. Phonological awareness explicit instruction empowers the learner to become an autodidact and a phonologically independent learner (which should be the ultimate goal of any instructor), which means providing students the enough phonological tools to go beyond the language learning process on their own, not relying or depending on an instructor for further language development or learning in higher levels of language proficiency.

Phonological learning helps students develop their abilities to understand spoken language and to be able to produce it accurately; in contrast, the lack of pronunciation knowledge impacts learners' reading and spelling skills, as well as other linguistic areas. Having a better understanding of how phonological systems work can significantly improve SLLs' pronunciation performance. The earlier students are aware of the phonological contrast between their L1 and the language being learned (whether it is a L2 or L3), will certainly improve the articulation accuracy rates of foreign sounds and a

will provide further understanding and capability of the phonological structures and phenomena surrounding them.

In this study, university students were assessed in regard to the FL phonological acquisition of the Spanish liquid segments. Here, it was possible to unveiled how a PA intervention could affect students' phonological skills within their first year or language learning. Even though a traditional teaching approach can also contribute in certain extent to the acquisition of sounds, the liquid segments in this case (specifically the [ɾ] segment), it was possible to prove how PA instruction gives students a comprehensive understanding of the articulatory processes of both, the sounds and their phonological contexts, and how it improves the learners' phonological accuracy by polishing the speakers' utterances to reach high articulatory rates in the pronunciation of the target segments.

Based on the results found, there is a high significant relation between PA training and the phonological accuracy performance of learners. The more students are aware of the phonological mechanism of their L1 and target FL, the higher their accuracy will improve in, at least a short-term impact, the phonological accuracy of segments, and also in a long-term basis as research has shown on the improvement of PA in all educational contexts (i.e. teaching young learners, adults, special education students, etc.).

Several research papers present phonological interferences between Japanese and other languages, but Spanish has been addressed only in few and specific areas that do not include all the contrastive segments in this pair of languages. This study showed how the liquid segments are certainly some of the main phonological difficulties for

Japanese students learning Spanish and it needs to be addressed properly in FL (i.e. PA) training. By analyzing more the five thousand utterances it is demonstrable that students struggle in differentiating the Spanish liquid segments and it was possible to identify the interferences (in extent, transfers) students used, due to their lack of PA, when uttering (reading) lexical units (within certain linguistic context) in Spanish. Mostly all interferences were produced within an allophonic environment of the liquid segments with a small rate due to other type of utterances. Through the proper and correct identification of the each liquid sound, when providing PA instruction to students, it is possible to overcome such phonological difficulties and help learners reach full articulatory accuracy.

There is not a magic methodological formula when applying PA methodology into a language learning environment, but certainly understanding the phonological foundations of the LA process through a phonological model (whether following the hierarchical pathway of Bernhardt and Stoel-Gammon's model, the continuum view of Phillips *et al,* the briefly-proposed model inversion for young adults in this study or any other) will assist the preparation of the necessary tools and materials to aim the communicational goal set by the the instructors and the programs. Even though there is not enough research for a clear methodological pathway for teaching PA to adult subjects, there are several methods and training techniques available for educators online and in published materials that can be applied in any language teaching curriculum. Moreover, Instituto Cervantes (a major Spanish organization devoted to promoting the teaching of Spanish language and culture) also provides suggestions and

some instructional material in order to achieve such goals through varied online and in print resources.

It is important to also mention that, regardless of the way PA training is implemented, it is important to use the active methodological teaching resources in order to achieve the linguistic goals. Most higher education settings tend to avoid the use of these methodologies due to the strong reluctancy of instructors to change the traditional educational paradigm and dedicate time to improve or change overall their lecture programs into a more effective strategy, so that students can acquire the necessary skills to succeed in their academic programs and later on in their professional lives.

Finally, from the data and results provided in this study, it is expected to create certain awareness on readers (whether they are instructors, learners or researchers) about the importance of phonological instruction in early stages of foreign language acquisition, regardless of their first language, educational level or previous phonological instruction. More research needs to be carried out on this field, specially in concern with learning Spanish as a FL, in order to make available a wide understanding of the phonological challenges students will have while learning other Spanish segments not included in this paper, and to create the necessary resources to be effectively applied in the classrooms.

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APPENDIX

A. GA accuracy rates and interferences per word

A.1 GA

A.1.1 GA [r] segment

Text 3 - Ramos

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	51	23	33	56	14	177
%	28.81	12.99	18.64	31.64	7.91	100

Text 4 - Rico

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	26	45	12	11	18	112
%	23.21	40.18	10.71	9.82	16.07	100

Text 7, 8 & 11 - restaurante

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	54	98	30	16	30	228
%	23.68	42.98	13.16	7.02	13.16	100

Text 8 - Rosa

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	14	18	11	12	2	57
%	24.56	31.58	19.30	21.05	3.51	100

Text 9 - Riqui

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	22	7	5	21	2	57
%	38.60	12.28	8.77	36.84	3.51	100

Text 10 - aburridas

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	0	30	15	2	8	55
%	0.00	54.55	27.27	3.64	14.55	100

Text 11 - guitarrista

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	4	19	23	2	9	57
%	7.02	33.33	40.35	3.51	15.79	100

A.1.2 GA [l] segment

Text 1 - lápiz

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	12	20	25	1	58
%	20.69	34.48	43.10	1.72	100

Text 2 & 4 - Lupe

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	95	158	81	6	340
%	27.94	46.47	23.82	1.76	100

Text 3 - escuela

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	7	36	11	4	58
%	12.07	62.07	18.97	6.90	100

Text 4 - hola

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	4	93	69	0	166
%	2.41	56.02	41.57	0.00	100

Text 5 - lunes

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	8	24	23	0	55
%	14.55	43.64	41.82	0.00	100

Text 6 - excelentes

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	44	11	1	57
%	1.75	77.19	19.30	1.75	100

Text 7 - baile

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	2	96	13	2	113
%	1.77	84.96	11.50	1.77	100

Text 7 - luego

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	17	44	52	0	113
%	15.04	38.94	46.02	0.00	100

Text 8 - alemán

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	43	14	0	57
%	0.00	75.44	24.56	0.00	100

Text 8 - elegante

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	49	4	2	58
%	5.17	84.48	6.90	3.45	100

Text 10 - lago

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	2	14	38	1	55
%	3.64	25.45	69.09	1.82	100

Text 10 - helado

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	39	13	0	55
%	5.45	70.91	23.64	0.00	100

Text 11 - salimos

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	31	19	3	56
%	5.36	55.36	33.93	5.36	100

Text 12 - familia

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	35	16	0	54
%	5.56	64.81	29.63	0.00	100

A.1.3 GA [l] segment

Text 1 - caramba

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	10	23	11	12	56
%	17.86	41.07	19.64	21.43	100

Text 2 - señorita

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	5	71	7	30	113
%	4.42	62.83	6.19	26.55	100

Text 4 - interesante

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	55	0	1	56
%	0.00	98.21	0.00	1.79	100

Text 5 - hora

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	2	44	3	8	57
%	3.51	77.19	5.26	14.04	100

Text 6 & 10 - ahora

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	21	116	18	10	165
%	12.73	70.30	10.91	6.06	100

Text 7 - tarea

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	5	45	2	3	55
%	9.09	81.82	3.64	5.45	100

Text 8 - restaurante

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	45	2	8	58
%	5.17	77.59	3.45	13.79	100

Text 8 - aire

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	53	2	1	57
%	1.75	92.98	3.51	1.75	100

Text 9 - gustaría

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	10	90	7	7	114
%	8.77	78.95	6.14	6.14	100

Text 10 - verano

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	43	6	3	55
%	5.45	78.18	10.91	5.45	100

Text 10 - periódico

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	52	1	1	54
%	0.00	96.30	1.85	1.85	100

Text 10 - espérame

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	53	0	2	55
%	0.00	96.36	0.00	3.64	100

enero

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	52	1	0	54
%	1.85	96.30	1.85	0.00	100

B. GA individual accuracy rates and interferences
B.2. GA [r] segment

GA1

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
A1	**f**	4	5	3	1	0	13	23.08
A2	**f**	4	2	0	7	0	13	0.00
A3	**m**	3	4	1	0	3	11	9.09
A4	**f**	2	5	0	6	0	13	0.00
A5	**f**	5	2	6	0	0	13	46.15
A6	**f**	1	7	0	5	0	13	0.00
A7	**f**	3	4	3	3	0	13	23.08
A8	**f**	3	3	3	4	0	13	23.08
A9	**m**	5	4	2	1	1	13	15.38
A10	**m**	0	11	1	1	0	13	7.69
A11	**m**	3	6	4	0	0	13	30.77
A12	**m**	5	1	1	4	1	12	8.33
A13	**f**	3	3	0	4	0	10	0.00
A14	**f**	1	8	0	3	1	13	0.00
A15	**f**	4	2	6	1	0	13	46.15
A16	**f**	3	10	0	0	0	13	0.00
A17	**f**	2	5	3	1	2	13	23.08
A18	**f**	6	5	1	1	0	13	7.69
A19	**f**	4	4	0	5	0	13	0.00
A20	**m**	2	2	3	3	0	10	30.00
A21	**f**	5	5	2	1	0	13	15.38
A22	**f**	0	1	11	1	0	13	84.62
A23	**m**	0	4	9	0	0	13	69.23
A24	**m**	3	4	4	0	2	13	30.77
A25	**f**	7	2	1	3	0	13	7.69
A26	**f**	0	9	4	0	0	13	30.77
Total		78	118	68	55	10	329	
%		23.71	35.87	20.67	16.72	3.04	100.00	

GA2

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
B1	**m**	3	10	0	0	0	13	0.00
B2	**m**	0	3	8	0	1	12	66.67
B3	**m**	4	5	1	1	2	13	7.69
B4	**f**	4	3	0	1	5	13	0.00
B5	**m**	2	0	6	2	3	13	46.15
B6	**f**	1	4	1	2	5	13	7.69
B7	**f**	4	1	0	0	8	13	0.00
B8	**m**	4	7	0	1	1	13	0.00
B9	**f**	7	2	1	1	2	13	7.69
B10	**m**	0	6	3	1	3	13	23.08
B11	**m**	0	5	1	7	0	13	7.69
B12	**m**	7	1	1	1	3	13	7.69
B13	**f**	1	4	3	4	1	13	23.08
B14	**f**	0	3	0	4	2	9	0.00
B15	**m**	2	3	3	4	1	13	23.08
B16	**f**	4	2	3	4	0	13	23.08
B17	**f**	2	8	0	2	0	12	0.00
B18	**m**	2	0	0	0	11	13	0.00
B19	**f**	2	6	2	0	3	13	15.38
B20	**m**	1	8	3	1	0	13	23.08
B21	**f**	4	3	4	0	2	13	30.77
B22	**m**	5	1	0	2	5	13	0.00
B23	**m**	8	1	2	2	0	13	15.38
B24	**f**	4	2	0	6	1	13	0.00
B25	**m**	2	9	0	1	0	12	0.00
B26	**f**	5	0	2	2	4	13	15.38
B27	**m**	5	2	5	0	1	13	38.46
B28	**m**	3	6	1	0	3	13	7.69
B29	**m**	1	4	0	3	1	9	0.00
B30	**m**	3	2	4	2	2	13	30.77
B31	**f**	2	2	1	6	2	13	7.69
B32	**f**	1	5	3	2	1	12	25.00
B33	**m**	0	4	3	3	0	10	30.00
Total		93	122	61	65	73	414	
%		22.46	29.47	14.73	15.70	17.63		

B.2. GA [l] segment

GA 1

		ɹ	ɾ	l	Others	Total Utterances	individual %
A1	**f**	5	11	7	0	23	30.43
A2	**f**	1	15	5	0	21	23.81
A3	**m**	4	12	5	0	21	23.81
A4	**f**	3	6	11	0	20	55.00
A5	**f**	3	17	3	0	23	13.04
A6	**f**	4	15	4	0	23	17.39
A7	**f**	2	16	5	0	23	21.74
A8	**f**	6	12	5	0	23	21.74
A9	**m**	5	11	7	0	23	30.43
A10	**m**	1	17	5	0	23	21.74
A11	**m**	1	13	7	1	22	31.82
A12	**m**	5	6	8	0	19	42.11
A13	**f**	1	13	8	0	22	36.36
A14	**f**	3	16	4	0	23	17.39
A15	**f**	0	5	18	0	23	78.26
A16	**f**	7	12	4	0	23	17.39
A17	**f**	5	16	2	0	23	8.70
A18	**f**	3	12	7	0	22	31.82
A19	**f**	3	13	7	0	23	30.43
A20	**m**	0	6	7	0	13	53.85
A21	**f**	5	9	8	1	23	34.78
A22	**f**	1	3	19	0	23	82.61
A23	**m**	1	17	5	0	23	21.74
A24	**m**	1	15	6	1	23	26.09
A25	**f**	3	13	6	0	22	27.27
A26	**f**	2	19	2	0	23	8.70
Total		75	320	175	3	573	
%		13.09	55.85	30.54	0.52	100.00	

GA 2

		ɹ	ɾ	l	Others	Total Utterances	individual %
A1	**m**	2	17	3	0	22	13.64
A2	**m**	1	16	4	0	21	19.05
A3	**m**	2	20	1	0	23	4.35
A4	**f**	4	14	5	0	23	21.74
A5	**m**	3	16	2	1	22	9.09
A6	**f**	5	8	6	3	22	27.27
A7	**f**	3	2	17	0	22	77.27
A8	**m**	3	15	4	0	22	18.18
A9	**f**	5	14	3	1	23	13.04
A10	**m**	0	21	2	0	23	8.70
A11	**m**	2	14	5	2	23	21.74
A12	**m**	1	16	6	0	23	26.09
A13	**f**	6	12	5	0	23	21.74
A14	**f**	6	10	5	0	21	23.81
A15	**m**	2	6	13	2	23	56.52
A16	**f**	5	10	8	0	23	34.78
A17	**f**	0	15	4	0	19	21.05
A18	**m**	4	11	6	2	23	26.09
A19	**f**	3	11	6	1	21	28.57
A20	**m**	0	4	19	0	23	82.61
A21	**f**	0	3	20	0	23	86.96
A22	**m**	1	12	9	1	23	39.13
A23	**m**	5	14	3	1	23	13.04
A24	**f**	5	10	8	0	23	34.78
A25	**m**	3	16	2	0	21	9.52
A26	**f**	2	7	14	0	23	60.87
A27	**m**	1	16	4	1	22	18.18
A28	**m**	5	15	3	0	23	13.04
A29	**m**	1	10	1	2	14	7.14
A30	**m**	0	17	5	0	22	22.73
A31	**f**	3	11	9	0	23	39.13
A32	**f**	2	19	2	0	23	8.70
A33	**m**	0	4	10	0	14	71.43
Total		85	406	214	17	722	
%		11.77	56.23	29.64	2.35	100.00	

B.3. GA [ɾ] segment

GA1.

		ɹ	ɾ	l	Others	Total Utterances	individual %
A1	**f**	1	15	1	0	17	88.24
A2	**f**	0	10	5	0	15	66.67
A3	**m**	0	15	0	0	15	100.00
A4	**f**	1	10	2	1	14	71.43
A5	**f**	2	14	1	0	17	82.35
A6	**f**	2	13	0	1	16	81.25
A7	**f**	0	16	1	0	17	94.12
A8	**f**	2	10	1	4	17	58.82
A9	**m**	1	16	0	0	17	94.12
A10	**m**	1	14	0	2	17	82.35
A11	**m**	1	13	1	1	16	81.25
A12	**m**	3	11	1	0	15	73.33
A13	**f**	2	13	1	1	17	76.47
A14	**f**	1	15	1	0	17	88.24
A15	**f**	2	8	3	4	17	47.06
A16	**f**	0	16	0	1	17	94.12
A17	**f**	1	13	1	1	16	81.25
A18	**f**	0	14	0	2	16	87.50
A19	**f**	3	14	0	0	17	82.35
A20	**m**	2	12	1	0	15	80.00
A21	**f**	2	11	3	1	17	64.71
A22	**f**	0	17	0	0	17	100.00
A23	**m**	1	8	1	6	16	50.00
A24	**m**	0	16	0	1	17	94.12
A25	**f**	1	15	0	1	17	88.24
A26	**f**	0	17	0	0	17	100.00
Total		29	346	24	27	426	
%		6.81	81.22	5.63	6.34	100.00	

GA2.

		ɹ	ɾ	l	Others	Total Utterances	individual %
A1	**f**	1	15	0	0	16	93.75
A2	**f**	0	14	1	2	17	82.35
A3	**m**	1	13	0	3	17	76.47
A4	**f**	1	14	0	2	17	82.35
A5	**f**	1	14	0	1	16	87.50
A6	**f**	1	13	0	2	16	81.25
A7	**f**	1	11	2	3	17	64.71
A8	**f**	0	15	1	0	16	93.75
A9	**m**	0	17	0	0	17	100.00
A10	**m**	1	14	0	2	17	82.35
A11	**m**	0	9	4	4	17	52.94
A12	**m**	1	11	1	4	17	64.71
A13	**f**	0	17	0	0	17	100.00
A14	**f**	1	9	0	4	14	64.29
A15	**f**	0	8	8	1	17	47.06
A16	**f**	1	12	2	2	17	70.59
A17	**f**	0	10	0	1	11	90.91
A18	**f**	3	10	0	4	17	58.82
A19	**f**	0	14	0	1	15	93.33
A20	**m**	2	15	0	0	17	88.24
A21	**f**	0	17	0	0	17	100.00
A22	**f**	2	8	3	4	17	47.06
A23	**m**	0	16	1	0	17	94.12
A24	**m**	3	12	1	1	17	70.59
A25	**f**	1	8	3	0	12	66.67
A26	**f**	2	7	2	6	17	41.18
A27		1	12	0	3	16	75.00
A28		0	16	1	0	17	94.12
A29		0	7	0	1	8	87.50
A30		3	6	0	7	16	37.50
A31		1	12	3	1	17	70.59
A32		1	14	1	0	16	87.50
A33		3	6	2	0	11	54.55
Total		32	396	36	59	523	
%		6.12	75.72	6.88	11.28	100.00	523

C. GB accuracy rates and interferences per word -before PA training
C.1 GB1
C.1.1 GB1 [r] segment

pizarra

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	6	12	1	4	8	31
%	19.35	38.71	3.23	12.90	25.81	100

borrador

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	1	13	2	2	13	31
%	3.23	41.94	6.45	6.45	41.94	100

terrible

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	2	13	8	4	4	31
%	6.45	41.94	25.81	12.90	12.90	100

Ramos

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	4	3	5	18	1	31
%	12.90	9.68	16.13	58.06	3.23	100

perro

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	3	16	3	6	3	31
%	9.68	51.61	9.68	19.35	9.68	100

C.1.2 GB1 [l] segment

mochila

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	9	73	3	8	93
%	9.68	78.49	3.23	8.60	100

lista

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	21	6	0	30
%	10.00	70.00	20.00	0.00	100

escuela

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	25	2	3	31
%	3.23	80.65	6.45	9.68	100

Lupe

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	10	33	15	1	59
%	16.95	55.93	25.42	1.69	100

López

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	8	26	28	0	62
%	12.90	41.94	45.16	0.00	100

C.1.3 GB1 [ɾ] segment

caramba

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	23	5	2	31
%	3.23	74.19	16.13	6.45	100

mira

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	2	27	0	1	30
%	6.67	90.00	0.00	3.33	100

señorita

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	2	17	1	11	31
%	6.45	54.84	3.23	35.48	100

eres

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	24	2	4	30
%	0.00	80.00	6.67	13.33	100

quiero

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	23	1	6	31
%	3.23	74.19	3.23	19.35	100

C.2 GB2

C.2.1 GB2 [r] segment

Raul

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	13	5	5	0	5	28
%	46.43	17.86	17.86	0.00	17.86	100

regular

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	13	12	2	1	0	28
%	46.43	42.86	7.14	3.57	0.00	100

recreo

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	8	14	2	2	2	28
%	28.57	50.00	7.14	7.14	7.14	100

aburrido

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	2	29	14	4	7	56
%	3.57	51.79	25.00	7.14	12.50	100

C.2.2 GB2 [l] segment

mochila.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	16	5	3	24
%	0.00	66.67	20.83	12.50	100

León

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	3	11	12	0	26
%	11.54	42.31	46.15	0.00	100

escuela.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	8	52	52	0	112
%	7.14	46.43	46.43	0.00	100

Lupe.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	17	41	20	0	78
%	21.79	52.56	25.64	0.00	100

hola

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	12	15	0	28
%	3.57	42.86	53.57	0.00	100

C.2.3 GB2 [ɾ] segment

senorita

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	4	12	5	6	27
%	14.81	44.44	18.52	22.22	100

quiero.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	6	35	2	13	56
%	10.71	62.50	3.57	23.21	100

eres.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	4	20	2	2	28
%	14.29	71.43	7.14	7.14	100

morena

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	15	50	10	3	78
%	19.23	64.10	12.82	3.85	100

mira.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	9	14	4	1	28
%	32.14	50.00	14.29	3.57	100

D. GB individual accuracy rates and interferences - before PA training

D.1. GB [r] segment

GB1

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
B1	**m**	1	2	0	0	2	5	0.00
B2	**f**	2	2	0	1	0	5	0.00
B3	**m**	1	2	0	2	0	5	0.00
B4	**m**	0	4	0	1	0	5	0.00
B5	**m**	1	2	1	1	0	5	20.00
B6	**m**	0	0	0	2	3	5	0.00
B7	**f**	1	1	0	2	1	5	0.00
B8	**f**	0	1	0	2	2	5	0.00
B9	**m**	1	2	0	1	1	5	0.00
B10	**f**	2	1	0	1	1	5	0.00
B11	**m**	1	1	1	0	2	5	20.00
B12	**f**	1	2	1	0	1	5	20.00
B13	**m**	1	0	0	4	0	5	0.00
B14	**m**	0	1	1	3	0	5	20.00
B15	**f**	1	2	0	0	2	5	0.00
B16	**m**	0	2	1	2	0	5	20.00
B17	**m**	0	4	0	1	0	5	0.00
B18	**f**	0	1	2	2	0	5	40.00
B19	**m**	0	1	2	1	1	5	40.00
B20	**m**	0	1	2	0	2	5	40.00
B21	**m**	0	1	0	2	2	5	0.00
B22	**m**	1	3	1	0	0	5	20.00
B23	**m**	0	3	1	1	0	5	20.00
B24	**m**	0	0	5	0	0	5	100.00
B25	**f**	0	2	0	0	3	5	0.00
B26	**m**	0	2	0	1	2	5	0.00
B27	**m**	1	3	0	1	0	5	0.00
B28	**m**	0	2	0	2	1	5	0.00
B29	**m**	1	4	0	0	0	5	0.00
B30	**m**	0	1	0	1	3	5	0.00
B31	**m**	0	3	2	0	0	5	40.00
Total		16	56	20	34	29	155	
%		10.32	36.13	12.90	21.94	18.71	100.00	140

GB2

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
B32	**f**	3	2	0	0	0	5	0.00
B33	**f**	3	0	2	0	0	5	40.00
B34	**f**	0	1	0	0	4	5	0.00
B35	**f**	2	0	0	2	1	5	0.00
B36	**f**	3	0	2	0	0	5	40.00
B37	**f**	4	1	0	0	0	5	0.00
B38	**f**	0	5	0	0	0	5	0.00
B39	**f**	2	3	0	0	0	5	0.00
B40	**f**	1	2	0	1	1	5	0.00
B41	**f**	1	4	0	0	0	5	0.00
B42	**f**	0	4	1	0	0	5	20.00
B43	**f**	1	3	1	0	0	5	20.00
B44	**f**	1	2	1	1	0	5	20.00
B45	**f**	2	1	2	0	0	5	40.00
B46	**f**	0	3	0	0	2	5	0.00
B47	**f**	0	5	0	0	0	5	0.00
B48	**f**	0	5	0	0	0	5	0.00
B49	**f**	1	3	1	0	0	5	20.00
B50	**f**	2	1	0	2	0	5	0.00
B51	**m**	2	2	0	1	0	5	0.00
B52	**f**	0	0	5	0	0	5	100.00
B53	**m**	1	2	2	0	0	5	40.00
B54	**m**	0	0	5	0	0	5	100.00
B55	**f**	1	3	1	0	0	5	20.00
B56	**f**	3	2	0	0	0	5	0.00
B57	**m**	1	2	0	0	2	5	0.00
B58	**m**	1	0	0	0	4	5	0.00
B59	**m**	1	4	0	0	0	5	0.00
Total		36	60	23	7	14	140	
%		25.71	42.86	16.43	5.00	10.00	100.00	

D.2. GB [l] segment

GB1.

		ɹ	ɾ	l	Others	Total Utterances	individual %
B1	**m**	0	4	3	0	7	42.86
B2	**f**	1	4	2	2	9	22.22
B3	**m**	1	6	2	0	9	22.22
B4	**m**	1	6	2	0	9	22.22
B5	**m**	1	4	4	0	9	44.44
B6	**m**	1	6	1	0	8	12.50
B7	**f**	3	5	1	0	9	11.11
B8	**f**	1	6	2	0	9	22.22
B9	**m**	1	7	1	0	9	11.11
B10	**f**	3	4	2	0	9	22.22
B11	**m**	1	7	0	1	9	0.00
B12	**f**	1	5	2	1	9	22.22
B13	**m**	3	3	3	0	9	33.33
B14	**m**	0	5	4	0	9	44.44
B15	**f**	0	3	3	3	9	33.33
B16	**m**	2	4	2	1	9	22.22
B17	**m**	1	8	0	0	9	0.00
B18	**f**	0	4	5	0	9	55.56
B19	**m**	0	6	3	0	9	33.33
B20	**m**	2	2	5	0	9	55.56
B21	**m**	1	7	0	1	9	0.00
B22	**m**	2	6	0	1	9	0.00
B23	**m**	0	9	0	0	9	0.00
B24	**m**	0	9	0	0	9	0.00
B25	**f**	2	7	0	0	9	0.00
B26	**m**	0	7	2	0	9	22.22
B27	**m**	0	9	0	0	9	0.00
B28	**m**	0	5	4	0	9	44.44
B29	**m**	0	9	0	0	9	0.00
B30	**m**	3	3	1	1	8	12.50
B31	**m**	0	8	0	1	9	0.00
Total		31	178	54	12	275	
%		11.27	64.73	19.64	4.36	100.00	

GB2.

		ɹ	ɾ	l	Others	Total Utterances	individual %
B32	**f**	2	3	3	0	8	37.50
B33	**f**	1	8	1	0	10	10.00
B34	**f**	0	9	0	1	10	0.00
B35	**f**	3	4	2	0	9	22.22
B36	**f**	0	4	3	0	7	42.86
B37	**f**	5	1	3	1	10	30.00
B38	**f**	0	8	2	0	10	20.00
B39	**f**	0	9	1	0	10	10.00
B40	**f**	2	6	2	0	10	20.00
B41	**f**	0	6	4	0	10	40.00
B42	**f**	0	9	1	0	10	10.00
B43	**f**	2	8	0	0	10	0.00
B44	**f**	1	1	8	0	10	80.00
B45	**f**	2	3	5	0	10	50.00
B46	**f**	0	3	7	0	10	70.00
B47	**f**	3	7	0	0	10	0.00
B48	**f**	1	2	4	0	7	57.14
B49	**f**	3	5	2	0	10	20.00
B50	**f**	0	4	6	0	10	60.00
B51	**m**	0	3	7	0	10	70.00
B52	**f**	0	2	8	0	10	80.00
B53	**m**	0	1	7	0	8	87.50
B54	**m**	2	5	3	0	10	30.00
B55	**f**	1	4	5	0	10	50.00
B56	**f**	0	6	3	1	10	30.00
B57	**m**	0	4	5	0	9	55.56
B58	**m**	0	1	9	0	10	90.00
B59	**m**	1	6	3	0	10	30.00
Total		29	132	104	3	268	
%		10.82	49.25	38.81	1.12	100.00	

D.3. GB [ɾ] segment

GB1-

		ɹ	ɾ	l	Others	Total Utterances	individual %
B1	**m**	0	3	0	1	4	75.00
B2	**f**	1	4	0	0	5	80.00
B3	**m**	0	4	0	1	5	80.00
B4	**m**	0	5	0	0	5	100.00
B5	**m**	0	4	1	0	5	80.00
B6	**m**	0	4	0	1	5	80.00
B7	**f**	0	4	1	0	5	80.00
B8	**f**	0	5	0	0	5	100.00
B9	**m**	0	4	0	1	5	80.00
B10	**f**	2	1	1	1	5	20.00
B11	**m**	0	3	0	2	5	60.00
B12	**f**	0	5	0	0	5	100.00
B13	**m**	0	1	4	0	5	20.00
B14	**m**	1	1	2	1	5	20.00
B15	**f**	0	4	0	1	5	80.00
B16	**m**	0	3	0	2	5	60.00
B17	**m**	0	5	0	0	5	100.00
B18	**f**	2	3	0	0	5	60.00
B19	**m**	0	4	0	1	5	80.00
B20	**m**	0	4	0	1	5	80.00
B21	**m**	0	3	0	2	5	60.00
B22	**m**	0	5	0	0	5	100.00
B23	**m**	0	5	0	0	5	100.00
B24	**m**	0	5	0	0	5	100.00
B25	**f**	0	3	0	2	5	60.00
B26	**m**	0	3	0	1	4	75.00
B27	**m**	0	5	0	0	5	100.00
B28	**m**	0	5	0	0	5	100.00
B29	**m**	0	4	0	1	5	80.00
B30	**m**	0	2	0	3	5	40.00
B31	**m**	0	3	0	2	5	60.00
Total		6	114	9	24	153	
%		3.92	74.51	5.88	15.69	100.00	

GB2-

		ɪ	ɾ	l	Others	Total Utterances	individual %
B32	**f**	2	4	0	1	7	57.14
B33	**f**	1	6	0	1	8	75.00
B34	**f**	1	4	2	1	8	50.00
B35	**f**	1	7	0	0	8	87.50
B36	**f**	2	2	0	1	5	40.00
B37	**f**	0	7	1	0	8	87.50
B38	**f**	0	7	1	0	8	87.50
B39	**f**	4	3	1	0	8	37.50
B40	**f**	3	5	0	0	8	62.50
B41	**f**	0	7	0	1	8	87.50
B42	**f**	1	7	0	0	8	87.50
B43	**f**	1	6	0	1	8	75.00
B44	**f**	4	3	0	1	8	37.50
B45	**f**	1	6	1	0	8	75.00
B46	**f**	1	3	0	4	8	37.50
B47	**f**	0	8	0	0	8	100.00
B48	**f**	0	5	0	0	5	100.00
B49	**f**	1	4	3	0	8	50.00
B50	**f**	2	1	3	2	8	12.50
B51	**m**	1	7	0	0	8	87.50
B52	**f**	3	2	2	1	8	25.00
B53	**m**	0	1	5	2	8	12.50
B54	**m**	4	4	0	0	8	50.00
B55	**f**	2	6	0	0	8	75.00
B56	**f**	0	7	0	1	8	87.50
B57	**m**	1	2	1	4	8	25.00
B58	**m**	1	2	3	2	8	25.00
B59	**m**	1	5	0	2	8	62.50
Total		38	131	23	25	217	
%		17.51	60.37	10.60	11.52	100.00	

E. GB accuracy rates and interferences per word - after PA training

E.1. GB

E.1.1 GB [r] segment

Ramos.

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	6	9	42	1	1	59
%	10.17	15.25	71.19	1.69	1.69	100

Rico.

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	3	8	42	2	4	59
%	5.08	13.56	71.19	3.39	6.78	100

aburrido.

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	4	4	45	2	4	59
%	6.78	6.78	76.27	3.39	6.78	100

perro.

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	2	9	44	1	3	59
%	3.39	15.25	74.58	1.69	5.08	100

restaurante.

Phonemes Uttered	ɹ	ɾ	r	l	Others	Total Utterances
Total	3	6	41	3	6	59
%	5.08	10.17	69.49	5.08	10.17	100

E.1.1 GB [l] segment

lunes.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	0	59	0	59
%	0.00	0.00	100.00	0.00	100

lana.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	0	59	0	59
%	0.00	0.00	100.00	0.00	100

solo.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	0	59	0	59
%	0.00	0.00	100.00	0.00	100

pelo.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	0	59	0	59
%	0.00	0.00	100.00	0.00	100

pala.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	0	59	0	59
%	0.00	0.00	100.00	0.00	100

E.1.1 GB [ɾ] segment

para.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	58	0	0	59
%	1.69	98.31	0.00	0.00	100

pero.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	58	0	0	59
%	1.69	98.31	0.00	0.00	100

señorita.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	58	0	0	59
%	1.69	98.31	0.00	0.00	100

tarea.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	1	58	0	0	59
%	1.69	98.31	0.00	0.00	100

hora.

Phonemes Uttered	ɹ	ɾ	l	Others	Total Utterances
Total	0	59	0	0	59
%	0.00	100.00	0.00	0.00	100

F. GB individual accuracy rates and interferences - after PA training
F.1. GB [r] segment

GB1 -

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
B1	**m**	0	2	1	2	0	5	20.00
B2	**f**	2	2	0	1	0	5	0.00
B3	**m**	0	0	5	0	0	5	100.00
B4	**m**	0	0	5	0	0	5	100.00
B5	**m**	0	0	5	0	0	5	100.00
B6	**m**	0	0	5	0	0	5	100.00
B7	**f**	0	2	0	3	0	5	0.00
B8	**f**	0	1	0	1	3	5	0.00
B9	**m**	0	0	5	0	0	5	100.00
B10	**f**	2	2	0	0	1	5	0.00
B11	**m**	0	0	5	0	0	5	100.00
B12	**f**	0	3	2	0	0	5	40.00
B13	**m**	0	0	5	0	0	5	100.00
B14	**m**	0	0	5	0	0	5	100.00
B15	**f**	0	0	5	0	0	5	100.00
B16	**m**	0	0	5	0	0	5	100.00
B17	**m**	0	3	2	0	0	5	40.00
B18	**f**	0	0	5	0	0	5	100.00
B19	**m**	0	0	5	0	0	5	100.00
B20	**m**	0	0	5	0	0	5	100.00
B21	**m**	0	0	5	0	0	5	100.00
B22	**m**	0	0	5	0	0	5	100.00
B23	**m**	0	0	5	0	0	5	100.00
B24	**m**	0	0	5	0	0	5	100.00
B25	**f**	0	1	0	0	4	5	0.00
B26	**m**	1	3	0	0	1	5	0.00
B27	**m**	0	0	5	0	0	5	100.00
B28	**m**	0	0	5	0	0	5	100.00
B29	**m**	0	0	5	0	0	5	100.00
B30	**m**	0	0	5	0	0	5	100.00
B31	**m**	0	0	5	0	0	5	100.00
Total		5	19	115	7	9	155	74.19
%		3.23	12.26	74.19	4.52	5.81	100.00	

GB2 -

		ɹ	ɾ	r	l	Others	Total Utterances	individual %
B32	**f**	0	0	5	0	0	5	100.00
B33	**f**	0	2	3	0	0	5	60.00
B34	**f**	0	0	5	0	0	5	100.00
B35	**f**	4	0	0	0	1	5	0.00
B36	**f**	1	0	3	0	1	5	60.00
B37	**f**	0	0	5	0	0	5	100.00
B38	**f**	1	4	0	0	0	5	0.00
B39	**f**	0	0	5	0	0	5	100.00
B40	**f**	0	0	5	0	0	5	100.00
B41	**f**	0	0	5	0	0	5	100.00
B42	**f**	0	0	5	0	0	5	100.00
B43	**f**	0	0	5	0	0	5	100.00
B44	**f**	0	0	5	0	0	5	100.00
B45	**f**	0	0	5	0	0	5	100.00
B46	**f**	1	2	0	0	2	5	0.00
B47	**f**	0	0	5	0	0	5	100.00
B48	**f**	0	0	5	0	0	5	100.00
B49	**f**	1	4	0	0	0	5	0.00
B50	**f**	1	2	0	2	0	5	0.00
B51	**m**	0	0	5	0	0	5	100.00
B52	**f**	0	0	5	0	0	5	100.00
B53	**m**	0	0	5	0	0	5	100.00
B54	**m**	0	0	4	0	1	5	80.00
B55	**f**	0	0	5	0	0	5	100.00
B56	**f**	0	0	5	0	0	5	100.00
B57	**m**	2	0	0	0	3	5	0.00
B58	**m**	0	0	4	0	1	5	80.00
B59	**m**	2	3	0	0	0	5	0.00
Total		13	17	99	2	9	140	
%		9.29	12.14	70.71	1.43	6.43	100.00	

F.2. GB [l] segment

GB 1-

		ɹ	ɾ	l	Others	Total Utterances	individual %
B1	**m**	0	0	5	0	5	100.00
B2	**f**	0	0	5	0	5	100.00
B3	**m**	0	0	5	0	5	100.00
B4	**m**	0	0	5	0	5	100.00
B5	**m**	0	0	5	0	5	100.00
B6	**m**	0	0	5	0	5	100.00
B7	**f**	0	0	5	0	5	100.00
B8	**f**	0	0	5	0	5	100.00
B9	**m**	0	0	5	0	5	100.00
B10	**f**	0	0	5	0	5	100.00
B11	**m**	0	0	5	0	5	100.00
B12	**f**	0	0	5	0	5	100.00
B13	**m**	0	0	5	0	5	100.00
B14	**m**	0	0	5	0	5	100.00
B15	**f**	0	0	5	0	5	100.00
B16	**m**	0	0	5	0	5	100.00
B17	**m**	0	0	5	0	5	100.00
B18	**f**	0	0	5	0	5	100.00
B19	**m**	0	0	5	0	5	100.00
B20	**m**	0	0	5	0	5	100.00
B21	**m**	0	0	5	0	5	100.00
B22	**m**	0	0	5	0	5	100.00
B23	**m**	0	0	5	0	5	100.00
B24	**m**	0	0	5	0	5	100.00
B25	**f**	0	0	5	0	5	100.00
B26	**m**	0	0	5	0	5	100.00
B27	**m**	0	0	5	0	5	100.00
B28	**m**	0	0	5	0	5	100.00
B29	**m**	0	0	5	0	5	100.00
B30	**m**	0	0	5	0	5	100.00
B31	**m**	0	0	5	0	5	100.00
Total		0	0	155	0	155	
%		0.00	0.00	100.00	0.00	100.00	

GB 2-

		ɹ	ɾ	l	Others	Total Utterances	individual %
B32	**f**	0	0	5	0	5	100.00
B33	**f**	0	0	5	0	5	100.00
B34	**f**	0	0	5	0	5	100.00
B35	**f**	0	0	5	0	5	100.00
B36	**f**	0	0	5	0	5	100.00
B37	**f**	0	0	5	0	5	100.00
B38	**f**	0	0	5	0	5	100.00
B39	**f**	0	0	5	0	5	100.00
B40	**f**	0	0	5	0	5	100.00
B41	**f**	0	0	5	0	5	100.00
B42	**f**	0	0	5	0	5	100.00
B43	**f**	0	0	5	0	5	100.00
B44	**f**	0	0	5	0	5	100.00
B45	**f**	0	0	5	0	5	100.00
B46	**f**	0	0	5	0	5	100.00
B47	**f**	0	0	5	0	5	100.00
B48	**f**	0	0	5	0	5	100.00
B49	**f**	0	0	5	0	5	100.00
B50	**f**	0	0	5	0	5	100.00
B51	**m**	0	0	5	0	5	100.00
B52	**f**	0	0	5	0	5	100.00
B53	**m**	0	0	5	0	5	100.00
B54	**m**	0	0	5	0	5	100.00
B55	**f**	0	0	5	0	5	100.00
B56	**f**	0	0	5	0	5	100.00
B57	**m**	0	0	5	0	5	100.00
B58	**m**	0	0	5	0	5	100.00
B59	**m**	0	0	5	0	5	100.00
Total		0	0	140	0	140	
%		0.00	0.00	100.00	0.00	100.00	

F.3. GB [ɾ] segment

GB.1

		ɹ	ɾ	l	Others	Total Utterances	individual %
B1	**m**	0	5	0	0	5	100.00
B2	**f**	0	5	0	0	5	100.00
B3	**m**	0	5	0	0	5	100.00
B4	**m**	0	5	0	0	5	100.00
B5	**m**	0	5	0	0	5	100.00
B6	**m**	0	5	0	0	5	100.00
B7	**f**	0	5	0	0	5	100.00
B8	**f**	0	5	0	0	5	100.00
B9	**m**	0	5	0	0	5	100.00
B10	**f**	0	5	0	0	5	100.00
B11	**m**	0	5	0	0	5	100.00
B12	**f**	0	5	0	0	5	100.00
B13	**m**	2	3	0	0	5	60.00
B14	**m**	0	5	0	0	5	100.00
B15	**f**	0	5	0	0	5	100.00
B16	**m**	0	5	0	0	5	100.00
B17	**m**	0	5	0	0	5	100.00
B18	**f**	0	5	0	0	5	100.00
B19	**m**	0	5	0	0	5	100.00
B20	**m**	0	5	0	0	5	100.00
B21	**m**	0	5	0	0	5	100.00
B22	**m**	0	5	0	0	5	100.00
B23	**m**	0	5	0	0	5	100.00
B24	**m**	0	5	0	0	5	100.00
B25	**f**	0	5	0	0	5	100.00
B26	**m**	0	5	0	0	5	100.00
B27	**m**	0	5	0	0	5	100.00
B28	**m**	0	5	0	0	5	100.00
B29	**m**	0	5	0	0	5	100.00
B30	**m**	0	5	0	0	5	100.00
B31	**m**	0	5	0	0	5	100.00
Total		2	153	0	0	155	
%		1.29	98.71	0.00	0.00	100.00	

GB.2

		ɹ	ɾ	l	Others	Total Utterances	individual %
B32	**f**	0	5	0	0	5	100.00
B33	**f**	0	5	0	0	5	100.00
B34	**f**	0	5	0	0	5	100.00
B35	**f**	2	3	0	0	5	60.00
B36	**f**	0	5	0	0	5	100.00
B37	**f**	0	5	0	0	5	100.00
B38	**f**	0	5	0	0	5	100.00
B39	**f**	0	5	0	0	5	100.00
B40	**f**	0	5	0	0	5	100.00
B41	**f**	0	5	0	0	5	100.00
B42	**f**	0	5	0	0	5	100.00
B43	**f**	0	5	0	0	5	100.00
B44	**f**	0	5	0	0	5	100.00
B45	**f**	0	5	0	0	5	100.00
B46	**f**	0	5	0	0	5	100.00
B47	**f**	0	5	0	0	5	100.00
B48	**f**	0	5	0	0	5	100.00
B49	**f**	0	5	0	0	5	100.00
B50	**f**	0	5	0	0	5	100.00
B51	**m**	0	5	0	0	5	100.00
B52	**f**	0	5	0	0	5	100.00
B53	**m**	0	5	0	0	5	100.00
B54	**m**	0	5	0	0	5	100.00
B55	**f**	0	5	0	0	5	100.00
B56	**f**	0	5	0	0	5	100.00
B57	**m**	0	5	0	0	5	100.00
B58	**m**	0	5	0	0	5	100.00
B59	**m**	0	5	0	0	5	100.00
Total		2	138	0	0	140	
%		1.43	98.57	0.00	0.00	100.00	

G. GA Reading texts used in oral assessment

Text 1

Lección Preliminar ¿Qué decimos...? En la librería

¿Qué más hay en la lista?

Juan: ¡Armando!

Armando: ¡Hola, Juan!

Juan: Dime, ¿qué más hay en la lista?

Armando: A ver ....

Juan: hay un cuaderno ...

Un lápiz ...

Y un bolígrafo.

Armando: ¿Y papel?

Juan: Sí ....

Y también una carpeta.

Armando: ¡Ay, caramba! No hay carpetas. Sí, hombre. Mira allí.

Juan: Ah, sí. ¿Es todo?

Armando: Sí, gracias.

Juan: Adiós.

Text 2

Buenas tardes, Ana

Buenas tardes, señorita Montero. ¿Cómo está usted?

Bien gracias.

¿Y quién es tu amiga?

Es mi amiga Lupe.

Mucho gusto, Lupe.

Encantada.

Oye, ¿quién es esa chica?

¡Lupe! ¡Es la profesora de español!

Buenos días, chicas.

Buenos días, profesora.

¿Cómo está usted, señorita Montero?

Bien, gracias. Pasen, por favor.

Text 3

Ramos: Sí, pasen.

David: Buenas tardes, señor Ramos.

Ramos: Buenas tardes.

David: Quiero presentarle a la nueva estudiante, Silvia López.

Silvia, el señor Ramos es el director de la escuela.

Silvia: Mucho gusto, señor Ramos.

Ramos: Es un placer, Silvia.

Bienvenida a Montebello High.

Eres de Ecuador, ¿verdad?

Silvia: Sí, señor, de Quito.

Text 4

Lupe: ¡Hola! Hola, Pilar. ¡Hola, Puerto Rico! Yo soy Lupe.

Pilar: Lupe, dime algo interesante. Dime, ¿cómo eres de verdad?

Lupe: ¿De verdad? Pues, francamente, soy bonita y simpática, y muy popular.

Pilar: También eres muy modesta, ¿no?

Lupe: Pues...

Pilar: Bueno. Gracias, Lupe.

Lupe: ¿Es todo? Bueno. Adiós, Pilar. Adiós, Puerto Rico.

Text 5

2. ¿Qué hora es?

Carlos: ¡Ay caramba!

¡No es mi clase!

Raúl: ¿Qué pasa, Carlos?

Carlos: ¿No hay clase de computación hoy?

Raúl: No, hombre.

Hoy es martes.

Tenemos computación los lunes, miércoles y viernes.

Carlos: Ah, sí, claro.

Los martes y jueves yo tengo educación física.

Raúl: Así es. Yo también.

Oye. Oye, ¿qué hora es?

Carlos: Son las nueve y diez.

Raúl: ¡Vamos!

Text 6

2. Somos muy simpáticos.

Sara: ¿Qué tal tus clases, Carlos?

Carlos: Fantásticas. Pero no son fáciles.

Carmen: ¿Y los profesores?

Carlos: Son excelentes.

Sara: ¿Y los estudiantes?

Somos simpáticos, ¿no?

Carlos: ¡Claro que sí!

Son divertidos, también.

Especialmente tú, Sara. 3. Es muy simpática.

Carlos: ¿Qué clase tienes ahora?

Sara: Matemáticas con la Sra. Estrada.

Es una clase estupenda.

Carmen: ¡Ay, no! Ella es tan desorganizada.

Sara: Sí, pero es muy simpática.

Es una profesora muy buena

y sus clases son muy divertidas.

Carlos: ¿Qué hora es?

¡Uy! Voy a llegar tarde a la clase de geografía.

Adiós

Sara: Adiós.

Text 7

4.

Mónica: Hola,Tomás. ¿Qué van a hacer esta tarde?

Tomás: Carlos y yo vamos a jugar básquetbol.

Tenemos práctica a las tres.

¿Y tú, Mónica?

Mónica: ¿Yo? Ahora tengo una clase de baile.

Tomás: Hasta luego.

Mónica: Adiós.

1. ¿Qué planes tienes tú?

Mónica: Hola, Sara. ¿Qué tal?

Sara: Ay.Tengo mucha tarea.

Y tengo que trabajar esta tarde en el restaurante.

Y tú, Mónica, ¿qué vas a hacer?

Mónica: Ahora voy a mi clase de baile.

Luego tengo que estudiar matemáticas.

Tengo examen mañana.

¿Y tú Carmen?

Carmen: Pues, yo voy a salir con una amiga.

Vamos a pasear en bicicleta.

Text 8

8.

Guía: Aquí estamos en el centro comercial Plaza Universidad.

Turista: ¿Hay buenas ofertas aquí?

Guía: Hay estupendas ofertas... y mucho más.

Hay tiendas de toda clase.

Hay cines con películas en español, en inglés, en alemán, en francés.

¡A mí me encanta este centro comercial!

9.

Guía: Nuestro tour termina aquí, en la Zona Rosa, una zona comercial

con las tiendas más elegantes de toda la ciudad.

También hay excelentes restaurantes y cafés al aire libre.

Text 9

2. Necesito hablar con papá.

Alicia: Mami, ¿vamos al parque mañana?

Mamá: Claro que sí, hija. ¿Por qué?

Alicia: Porque Kati, mi amiga norteamericana,

va de compras a Plaza Universidad

y me gustaría ir con ella.

Mamá: Pues, yo creo que está bien,

pero habla con tu papá.

Está en el patio con Riqui.

Alicia: Gracias, mamita. ¡Papá!

Papá: ¿Qué pasa?

Alicia: Papi, es que mañana hay muchas ofertas en las tiendas y ...

me gustaría ir de compras.

Papá: ¿De compras? ¿Mañana?

Alicia: Sí, papi, con mi amiga Kati, por favor.

Papá: Bueno, está bien, hija.

Alicia: Gracias.

Text 10

2. ¡Uy! Perdón.

Pedro Solis: Y ahora, estamos en el lago de Chapultepec.

Riqui: ¡Uy! Perdón, señor.

Pedro Solís: Está bien.

¿Adónde vas, muchacho?

Riqui: Voy a comprar un helado.

Pedro Solis: Buena idea.

Hace bastante calor hoy.

¿Pasas mucho tiempo en el parque?

Riqui: En primavera, verano, otoño, sí.

En invierno no, porque hace frío.

A mis papás les encanta el parque.

Pedro Solis: ¡Qué bien!

¿Y qué hacen ellos aquí?

Riqui: Cosas aburridas.

Papá lee el periódico.

Mamá descansa o escribe cartas.

Pedro Solis: Y tú, ¿qué haces?

Riqui: Tomo helados.

También me subo a las lanchas,

visito el zoológico.

Ah, y ahora voy al parque de diversiones con mi hermano.

Daniel, ¡espérame!

Pedro Solis: Bien, gracias.

Text 11

5. 3:00

Por la tarde comemos

si es posible en un restaurante al aire libre.

El muchacho que trabaja en el restaurante es muy guapo. 6. 7:00

A veces hay una fiesta en casa de un amigo.

Kati y Daniel bailan muy bien, ¿no?

7. domingo 11:00

Los domingos siempre salimos de casa

un poco antes de las once y vamos a la iglesia.

Después paseamos y comemos juntos.

8. 6:00

Por la tarde, mi amigo Martín me lleva a una discoteca. ¡Cuánta gente hay!

Me encanta esta música.

El guitarrista toca y canta muy bien.

Y ustedes, ¿qué hacen un fin de semana típico?

Text 12

6

¿Por qué estamos todos aquí hoy?

¡Porque es el diecisiete de marzo!

Es el cumpleaños de abuelito.

Y el diecinueve de marzo es el cumpleaños de Lupe. ¡Hoy celebramos los dos cumpleaños juntos! ¿Cuántos años van a cumplir?

Él, sesenta y ocho, y ella, catorce.

7

Mi familia es grande.

Tenemos que celebrar muchos cumpleaños.

Mi cumpleaños, por ejemplo, es el treinta de junio,

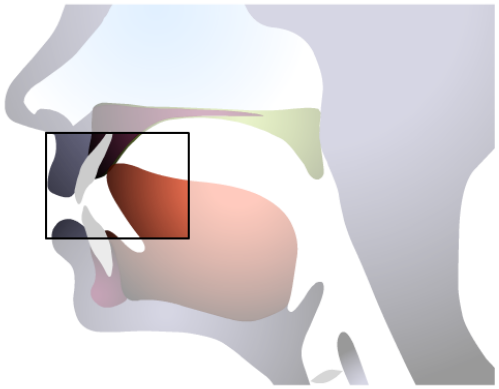
y el cumpleaños de papá es el doce de enero. ¿Cuándo es el cumpleaños de mi tía Elena?

Y tú, ¿cuándo es tu cumpleaños?

Sonidos / l /, / r / y / r /

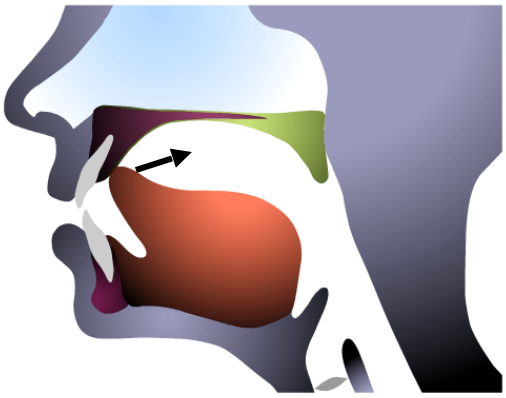
/ l /: press hard & long

Ejemplos: lunes, lana, loza, solo, pelo



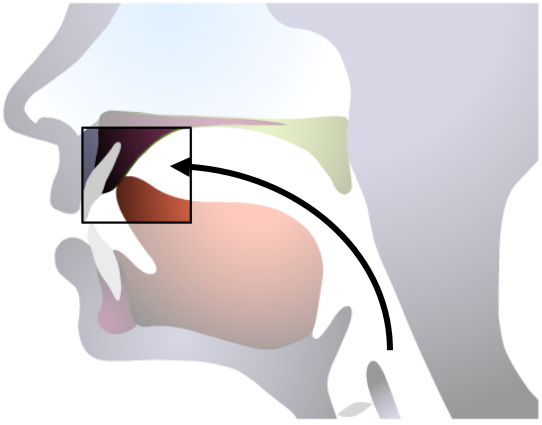
/ r /: flip slightly & quickly

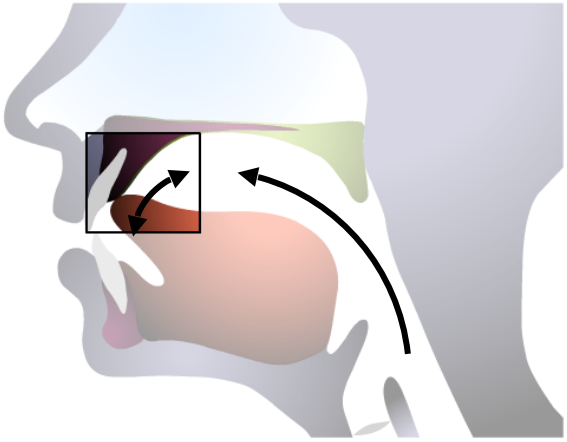
Ejemplos: para, pero, sobre, martes cuerda,



/ r /: touch, relax, remain & blow strongly

Ejemplos: **R**amos, pe**rr**o, **r**ico, abu**rr**ido, **r**estaurante, **r**osa





I. Consent letter

Consent to Participate in a Research Study
Tohoku University ● IGPLS Program

You are being asked to participate in a research study conducted by Miguel Campos from the International Cultural Studies Faculty at Tohoku University. The purpose of this study is to determine the accurate production of Spanish sounds by Japanese students of Spanish as a foreign language. This study will contribute to the researcher's completion of his doctoral program and research.

Your participation in this study is completely voluntary and will require your consent for the use of audio material recorded in Spanish class at Tohoku University. The results of this research will be presented at conference presentations and seminars by the researcher. All individual recordings obtained will remain anonymous and kept in the strictest confidence, no personal information from the participants will be presented or shared through this study, and all data will be stored in a secure location.

If you have questions or concerns about your participation in this study or after its completion, please contact:

Miguel Campos, PhD Student.

International Graduate Program in Language Sciences
Tohoku University
migerukt@gmail.com
(81) - 080 - 5730 - 2629

I have read this letter and I understand what is being requested of me as a participant in this study. I freely consent to participate and certify that I am at least 18 years of age.

_____
Subject's name (English)

_____ _____ _____, 2016
Subject's signature (Signed) Month Day

_____
Researcher's Name and Signature

Consentimiento para participar en estudio de investigación
Universidad de Tohoku ● Programa IGPLS

A través de la presente se le solicita participar es un estudio de investigación llevado a cabo por Miguel Campos, estudiante de la Facultad de Estudios Culturales Internacionales en la Universidad de Tohoku. El propósito de este estudio es determinar la correcta producción de sonidos del español realizados por estudiantes japoneses de español como lengua extranjera. Este estudio contribuirá al progreso de la investigación del realizador y al avance en su programa de doctorado.

Su participación en este estudio es completamente voluntaria y requerirá su consentimiento para el uso de material de audio grabado en su clase de español en la Universidad de Tohoku. Los resultados de este estudio serán mostrados por el investigador en presentaciones de conferencias y seminarios. Todas las grabaciones obtenidas permanecerán anónimas y serán almacenadas en estricta confidencialidad; ninguna información personal de los participantes será mostrada o compartida a través de este estudio y toda la información será guardada en una instalación segura.

Si posee alguna pregunta o inquietud acerca de su participación durante este estudio o después de su finalización, por favor contactar a:

Miguel Campos, Estudiante de Doctorado.
Programa Internacional de Postgrado en Ciencias de Lenguage
Universidad de Tohoku
migerukt@gmail.com
(81) - 080 - 5730 - 2629

He leído esta carta de consentimiento y entiendo lo que se solicita de mí como participante en este estudio. Voluntariamente doy mi consentimiento y certifico ser mayor de 18 años.

_____
Nombre del participante (Español)

_____ _____ de _____ de 2016
Firma del participante Día Mes

_____
Nombre y firma del investigador

東北大学・**IGPLS**プログラム
研究参加承諾書

あなたは、東北大学国際文化研究科に所属するMiguel Camposによって行われている研究への参加を要請されています。この研究の目的は、日本人学生が外国語として発音したスペイン語を正確に調査することです。この調査は本研究者の博士課程での研究を達成することに貢献します。

あなたがこの研究に参加するかどうかは任意です。参加される場合は東北大学のスペイン語の授業であなたが録音した録音データを本研究者が使用することを承諾する必要があります。この調査の結果は、本研究者によって学会やセミナーで発表されます。得られたそれぞれの録音データは名前を伏せ、厳重な注意のもと管理され、この研究への参加で得られた個人情報がこの研究を通して公表されたり共有されたりすることは絶対になく、すべてのデータは安全な場所に保管されます。

本研究期間中あるいは研究期間終了後に、もしこの研究への参加に関する質問や疑問があった場合は、次の連絡先へご連絡をお願いいたします。

Miguel Campos, PhD Student.

International Graduate Program in Language Sciences
Tohoku University
migerukt@gmail.com
(81) - 080 - 5730 - 2629

私はこの承諾書の内容を読み、この研究への参加のために私が何を要請されているのか理解しました。私は自分の意思に基づいてこの研究への参加を承諾します。私は18歳以上です。

_____
承認者名（アルファベット）

_____ 2016年___月 ___日
承認者署名（サイン）

_____
研究者名・署名