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Topic:

THE IMPROVEMENT OF L2 ENGLISH SPEECH PATTERNS BY IMPLEMENTING ONLINE TOOLS TO L1 SPANISH SPEAKERS

Research Project Prior to Obtaining the Master's Degree on English Pedagogy as a Foreign Language

Line of Research:

INNOVATIVE PEDAGOGIES

Author:

William Ricardo Navas Colón

Director:

M.A. Melanie Schmidt

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Author:

William Ricardo Navas Colón

Melanie Schmidt, M.A. f._____
CALIFICADOR

María Augusta Villacrés Camino, Lic. Mg. f._____
CALIFICADOR

Paola Vanessa Navarrete Cuesta, Lic. Mg. f._____
CALIFICADOR

Teresa Milena Freire Aillón, Ing. Mg. f._____
CENTRO DE POSGRADOS

Diego Gonzalo Coca Chanalata, Dr. f._____
SECRETARIO GENERAL PUCESA

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DIRECCIÓN CENTRO DE POSGRADOS Sede Ambato

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DEDICATION

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William Navas

RESUMEN

La presente investigación lingüística se enfoca en el mal uso de los fonemas consonánticos /θ/ y /ð/ del idioma inglés. Su sustitución por los sonidos consonánticos /d/ y /t/ del idioma español en palabras del inglés que incluyen el grafema >th< por estudiantes nativos del español en el nivel de inglés B1 del Instituto de Idiomas South American Language Center de Latacunga, Ecuador, en el período escolar 2021-2022. Este trabajo investigativo fue llevado a cabo desde un enfoque mixto, el cual también tomó como base investigaciones previas bibliográficas e investigaciones de campo. También, en este proyecto se trabajó con el total del universo investigado ya que el número de participantes fue apropiado para la aplicación de los instrumentos y el desarrollo del trabajo. Los resultados fueron debidamente analizados y tabulados. Se pudo observar que en la producción de palabras del inglés que incluyen el grafema >th<, representado en la base fonológica por los dos fonemas /θ/ y /ð/, los participantes del estudio en la mayoría de los casos reemplazaron dichos fonemas por los sonidos consonánticos /t/ y /d/ del español. Con la implementación de herramientas de aprendizaje en las clases, así como el monitoreo, la transferencia fonológica de los estudiantes fue mejorado durante la investigación.

Palabras clave: adquisición de lenguas extranjeras, estructuras fonológicas, interferencia, los fonemas del inglés /θ/ y/ð/.

ABSTRACT

The present linguistic research focuses on the misuse of the consonantal phonemes /θ/ and /ð/ of the English language. Their substitution by the consonantal sounds /d/ and /t/ of the Spanish language in English words that include the grapheme >th< by native Spanish students at the B1 level of English at the South American Language Center in Latacunga, Ecuador, in the 2021-2022 school year. This investigative work was carried out from a mixed approach, which was also based on previous bibliographic and field research. In addition, this project worked with the total universe investigated since the number of participants was appropriate for the application of the instruments and the development of the work. The results were duly analyzed and tabulated. It was observed that in the production of English words that include the grapheme >th<, represented in the phonological base by the two phonemes /θ/ and /ð/, the study´s participants in most cases replaced these phonemes by the Spanish consonant sounds /t/ and /d/. With the implementation of learning tools in the classes, as well as monitoring, the phonological transfer of the students was improved during the investigation.

Keywords: *English phonemes /θ/ and /ð/, interference, language acquisition, phonological patterns.*

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INTRODUCTION

Second language learning (SLL) has always been considered to be challenging from different aspects of a language learner. In a more and more globalized world, English as a second language has gathered a huge importance due to growing demands of communication. However, language transfer and interferences from one language to another have consistently posed a challenge to the majority of foreign language learners.

Beyond the influence of the phonological system of L1 on L2, the are other factors that are of upmost importance which impact language learning such as the age, the motivation, and prior experiences in learning other foreign languages. Nonetheless, the phonological acquisition of the L2 is a process that is very complex that demands learners to consolidate new ways of learning. In addition, to correctly use this knowledge and be able to materialize the articulation of sounds accurately. Therefore, it may be difficult for learners specifically when the L1 stands apart remarkably from the L2 making it challenging to reach a high level of proficiency in phonological perception. For this reason, it is important to know how the main articulators are involved in the utterance of the English sounds / θ / and / ð /.

Due to this growing importance of pronunciation in the learning of English as a foreign language, language institutions in the last years have been looking for ways of how to improve L2 English phonological patterns in L1 Spanish speakers through the implementation of online tools, for which the present investigation was carried out. The central purpose of this study is to detect, observe and then to analyze the overextension of the Spanish plosive consonant sounds /d/ and /t/ in English words which include the diagraph >th<, represented by the English fricative sounds /θ/ and /ð/. A diagraph are two letters that, when pronounced, only make one sound as the English >th< in >the< or >ch< in >chat<.

As mentioned, this investigation tries to illustrate the behavior of certain phonological aspects and differences between L1 Spanish and L2 English. Therefore, present obstacles for L1 Spanish native speakers due to the non-

existence of some L2 phonological speech patterns in L1. As in the case of the English dental fricative consonant phonemes /θ/ and /ð/ that do not occur in the Ecuadorian Spanish phoneme inventory and are generally replaced by the Spanish dental plosives /d/ and /t/ which lead to a mispronunciation in English words containing the diagraph >th< as in >think< or >they<.

Veiga-Perez (2017) indicated a difference between languages is how phonological distinctive each of them are. Therefore, it was explained that 26 English graphemes represent 45 phonemes, so English has a wide variation in pronunciation. Besides, English is not a phonetic language which means that we often do not say a word the same way it is spelled as in the initial positions of >them< and >thunder<. Some letters can have the same spelling but different pronunciation.

However, in Spanish, 24 graphemes only represent 24 phonemes. A grapheme is how a sound is represented by a letter, so that the differently pronounced English phonemes /θ/ and /ð/ both are represented by the same letters >th<. A phoneme is the smallest sound unit of a word and if mispronounced could change the meaning of it as in the minimal pair >hair< and >pair<. In Spanish, almost all the phonemes are pronounced as spelled and there is no such a variation in the pronunciation of certain sounds if we exclude the differences between European Spanish and South American Spanish.

Before the research, data of this investigation will be evaluated and analyzed and former studies related to theories and models of L1 and L2 acquisition as well as linguistics processes such as interferences or phonological transfer will be presented to understand the study´s results and interpretation. The hypothesis and research question will be verified, and finally, the conclusion and recommendations will be presented.

The research problem

Studying a foreign language has always brought along several challenges and obstacles for every learner. Especially the research field of foreign language

phonology has gained more importance over the last decades. It was clarified that a learner´s pronunciation is one of the essential parts in L2 learning processes and without correct pronunciation, the message of a speaker will be less effective when communicating and can lead to misunderstandings. Pronunciation skills in L2 are a vital component of communicative competence, especially when they are difficult to learn. The majority of L2 learners have difficulties in improving their pronunciation on their own (Derwing & Munro, M.j., 2013) and therefore it seems necessary to provide them with instruction in pronunciation.

Another problem can be that foreign language teachers are confused about the learning goal of pronunciation in each English level, how learners should be guided toward reaching that goal and how to effectively teach phonetics and phonology.

Although there is a wide range of differences and challenges for L1 Spanish native speaker learning L2 English phonology, this project specifically concentrates on the study of the overextension of the Spanish dental plosives sounds /d/ and /t/ in English words containing the diagraph >th< and its respective phonological representation of dental fricatives /θ/ and /ð/.

It is acknowledged that when learning L2 English, the predisposition for the L1 Spanish speaker is to pronounce a word how it is written since L1 structures work like that. After all, it is ordinary for complications to arise in students when the level of English is very low. Yet, taking into consideration when a determined level is learned in L2, within reach to moderately diversify the production of Spanish speech patterns from those of English. Hence, when learning L2 English, L1 Spanish speakers lean toward combining L1 and L2 pronunciation patterns without distinguishing both from each other.

The investigated L2 phonemes /θ/ and /ð/ that do not occur in Ecuadorian Spanish. Therefore, displays a major challenge for L1 Spanish speakers are only one example of how L1 speech patterns, in this case the Spanish sounds /d/ and /t/, are frequently used to replace a new L2 sound category that L1 does not include and

shows the negative language transfer from L1 to L2 and the entire importance of this investigation.

The hypothesis of this investigation is that it is expected that the probands of this study perform this error in the oral L2 management to demonstrate an overstrain of L1 Spanish speech patterns in L2 English containing these phonemes.

Defended idea

Work Hypothesis: The improvement of L2 English speech patterns by implementing online tools for L1 Spanish speakers.

Objectives

General objective

To analyze and improve phonological features in L2 English speech production by L1 Spanish students.

Specific Objectives

1. To analyze L2 English speech production of /θ/ and /ð/ by L1 Spanish learners through a voice analysis program.
2. To identify the overextension of L1 sound patterns in L2 English.
3. To create strategies and use online tools that can improve L1 interferences.
4. To share and reflect on the results within the educational community.

Research Justification

Due to globalization and its effects worldwide, it is vital to learn foreign languages nowadays and the English language is specifically the most used form of communication between people around the world. Furthermore, English is indispensable for fields in which a person usually evolves. Hence, the proper use of

phonetic and phonological rules that this lexicon encloses must be known for good pronunciation and communication. Regulating a standard English level means considering what a speaker conveys, and making your statements reach the interlocutor so, that he or she can fully understand the information. Nonetheless, in many instances, teachers and students are inclined to make inaccuracies in the production of English as a foreign language because of distinct circumstances.

CHAPTER I. STATE OF ART AND PRACTICE

1.1 First Language Acquisition

First Language Acquisition is the process of acquisition of the mother tongue everyone learns from their date of birth or even before birth when infants start acquiring their native language (Wrobel, 2013). Additionally, all humans can communicate and transmit ideas and thoughts and express necessary suppositions to communicate in several ways. Vocal signs and visual language, composed to be one of the most integrated systems of communication, concurrently form these requirements.

A certain form of communication is found, although we are not permanently conscious of it. Engaging some common sounds such as currying, laughing, shouting, or any visual language (signs) in babies, humans know their exigencies as a part of their necessity. Hence, scientist and savants propose theories, models, and findings to resolve the influence of communicative ability. Stanborough (2019) confirms Noam Chomsky´s findings (1957) that there is a Universal Grammar in all human beings, which means that they may be born with innate understanding that is developed in the mind from the moment of birth and through genetics.

Language is a mechanism that ought to be acquired and takes some important features from the environment, understanding the culture in which the child matures and grows up to be able to master and employ it accurately.

So, children inherit a grammatical structure which is instinctive and allows to acquire a dialect. Separately, “children gain language through interaction - not only with parents but also with other children. All children who develop in ordinary households, enclosed by conversation, will obtain the language that is normally used” (Birner, 2022). William (2003) added that “what makes matters especially interesting for theories of language acquisition is that grammars that include even these basic and relatively uncontroversial mechanisms are underdetermined by experience in significant ways.”

Language evolution in children is considered an important concern since it leads linguists to distinct techniques used in the field of language acquisition.

According to Piaget (2003) cited by Quesada (2011) young children are active learners since they learn through first-hand experiences and through knowledge which they imitate and convert into their own behavioral styles. L1 acquisition includes various stages and is said to be completed at the age of five while grammar is the result of the acquisition of the mother tongue.

It is of great importance to consider L1 acquisition in this research project to examine the possible origins of a L1 sound overextension that could alter the pronunciation of the L2 English phonemes /θ/ and /ð/.

The Exogenic Model: Behaviorism

The Behaviorist Theory is an acquisition model of L1 and believes that “infants learn oral language from other human role models through a process involving imitation, rewards, and practice. Human role models in an infant's environment provide the stimuli and rewards,” according to Cooter & Reutzel (2004) cited by Ethnocentrism and African American literature (2017).

In terms of Watson, (1913) cited by Pellón (2013): “Psychology as the behaviorist sees it is a branch of the natural, objective, and experimental sciences. Its theoretical goals are the prediction and control of behavior."
According to Skinner's theory (1966) cited by Pellón (2013) the behavior of individuals is sustained by consequences.” Furthermore, he pointed out in his example: “The pigeon, the subject par excellence of operant experiments carried out or directed by Skinner, it does not peck the experimental box key to get food but does so because in the past the behavior of picking the key was followed by certain consequences."

The behavioral orientation allows to intervene in the teaching and learning that tried to fill the gap between the entrance and the exit of behaviorism. The cognitive

orientation of learning, based on the thought of Beltrán (1993) and cited by Serrano & Pons (2011); displays the “theory of two metaphors, according to cognitive evolution, which are the behavioral paradigm, learning as the acquisition of knowledge, and the constructivist paradigm, learning as the construction of meanings.

The endogenic Model: Nativism

The fact that children can acquire language, that is, learn its phonological structures and grammatical rules only by listening to their mother tongue and putting it into practice, created a hypothesis in nativist theory. The ability of children to acquire a variety of vocabulary and subsequently be able to infer and apply rules to form sentences and be understood through speech. The nativism theory by Noam Chomsky (1986) indicates that already newborns dispose of the so-called “Universal Grammar” and therefore do not need to learn certain aspects of their L1 because of their innate abilities.

Brown (2000) notes that nativist studies were able to make hypothetical predictions about the use of grammar of a learner, and that the grammar which consisted of the descriptions of the language systems were formal representations of the structure and the rules of the production. Therefore, the structure is not always performed in speech. This model was structural methodology and helped researchers to reach huge advances in the process of language acquisition. (Gabriotti, 2020)

1.2 Second Language Acquisition (SLA)

To apply more useful and beneficial techniques in foreign language teaching, it is important to understand what the internal processes of language acquisition are, initially in the mother tongue, to study similar processes in the acquisition of further foreign languages. (Navarro Romero, 2010).

“Learning a foreign language involves studying its vocabulary, its grammatical rules and also its sound system. Phonetics and phonology deal with this last aspect” (González & Algara, 2010).

It should be noted that all learning starts from the mother tongue and at the time of learning a first foreign language the entire learning process becomes more complex since learning a foreign language follows its own rules, speech patterns and new areas in a human´s brain are activated. The acquisition of a L2 implies studying new structures, maybe a new language typology and when it comes to phonology, the phonological patterns can be similar or new and very different when compared to L1.

Therefore, both languages, the first and second language, gain different affective ideals, learners will put effort into their learning. Likewise, they boost comprehension skills, where they cooperate and exchange experiences and advice. The dedication to cognitive improvement comes from the alliance between the learner and his or her thoughts.

As mentioned by Adwanil & Shrivastava (2017) “The sum of our cognizance about the factors influencing second language learning is very constrained and imprecise". Therefore, it can be more difficult for some languages to be learned since there is no relationship to the roots of the first language. For instance, L1 Spanish speakers learn any Neo-Latin language (Italian, French) with no difficulties because they are equivalent language group as Spanish. However, particularly challenging for L1 Spanish speakers to learn Greek, Chinese or German. All dialects follow certain typological clusters and language patterns. Thus, these patterns must be comprehensible, exercised, and mastered to learn the language appropriately.

Bilingualism

In a globalized world it is almost a matter of course being bilingual. Wei (2000) mentions that the “bilingualism refers to the ability to use two languages in everyday life. Bilingualism is common and is on the rise in many parts of the world, with

perhaps one in three people being bilingual or multilingual" (Byers Heinlein & Lew Williams, 2013).

The general development of the teaching-learning process according to Madrid (2006), proposes a chain of steps in the implementation in the educational system in which it is specified that learning two languages creates cognitive and linguistic advantages for students (Ramírez Castillo & Torres Calles, 2011). The accumulation of the different metalinguistic abilities often promotes the learning processes of other educational disciplines, too. Moreover, it helps learners to capture differences of linguistic systems and even contributes to the improvement of L1.

As mentioned by Ardila (2012) the advantages of bilingualism are related to learning new cognitive strategies, a better understanding of the first language and an increase in cognitive control. He also emphasized that "balanced bilinguals are extremely rare (if they exist at all) and usually the bilingual has better L1 handling of certain topics and in certain contexts, and better L2 skills for other topics and contexts."

Differences between L1 and L2 acquisition

Various linguists such as Krashen (1982) cited by Moinzade, Dezhara & Rezaei (2012) mention there is a distinction between learning, the explicit, conscious knowing about the language that occurs through instruction and classrooms practices and acquiring of the mother tongue which is the way a child unconsciously gets its first language.

Builtrago, Ramirez & Rios stated that according to contrastive studies, the method of audios and their similarities (audio-visual and communicative) in order to learn a second language, they have insisted on the negative perception that this role of the mother tongue, since it may interfere in the process of acquisition and learning (2011).

Linguistics features that L1 and L2 share, normally are easier to learn than clusters both languages do not have in common. The degree of simplicity in L2 phonology for a learner would represent a phoneme in the L2 that has an equivalent in the L1. Nonetheless, both languages are distributed in a similar way, the learning of the L2 is based on a creative process, where the learners start from the knowledge acquired in L1 (González & Algara, Modelos teórico-metodológicos sobre la adquisición de la fonología de la L2: Descripción, validez y vigencia, 2010).

Concerning, the learning of a foreign language phonology in which a great difference can be observed that children acquire innate linguistic abilities in L1. Eventually, children would naturally apply these abilities to another language learned at early stages while adolescents and adults consciously or unconsciously start to transfers rules from L1 into L2, which often ends in substitutions (negative transfer) of the new system.

As mentioned by Chireac, Serrat & Huguet (2011) “the differences between the languages would make it difficult to acquire the structures of the L2, and therefore, each difference with respect to the L1 would represent a risk of error for the learner.” According to Salazar (2006) “it is about the effects that occur when the mother tongue and a second or foreign language come into contact”.

Acquisition Scenarios (*learning vs. acquiring*)

Even though they may be similar terms, there is a clear distinction between the concepts of acquisition and learning. Nor and Ab Rashid (2018) mentioned that “acquisition” happens naturally and mainly effortlessly because it is a subconscious and innate process where a baby does not learn the formal structure of the mother tongue. The acquisition of the mother tongue is mainly observed from the moment of birth, from there it is developed in the child's environment, the mother tongue is the basis for learning further languages since the different linguistic processes start from here; it requires time and some effort.

As mentioned in the publication of Gutiérrez Ramírez & Land Eros Falcón (2010):

> It was mentioned and understood by mother tongue, the first language that the person learns which is by acquisition. Therefore, learned by the influence of the environment, such as the family, where certain words are repeated. The second language is that language, which is developed by learning, or the need for a common language that allows communication between people of different languages. (p. 95)

It is necessary to clarify that the role of a mother is important, it is the one who teaches absolutely everything to children from an early age, it is managed through an environment in which the child indirectly learns information in this case the mother tongue. Learning linguistic features and patterns of the L1 depends a lot on everyday speech, for which it should be mentioned that the reception phase, that is, the first stage, is the most important for maintaining a structure.

However, Krashen (1982) stated that the word “learning” refers to a conscious interaction which intentionally involves studying of structural perspectives and linguistic patterns of the object language. Acquisition of L2 is often related to an educational institution, where the content and classes as well as the necessary materials and instruments are provided. When students find a new word, they should only look for certain characteristics to be able to recognize it, that is where the practice comes from, for which it must be clear that the receptive phase includes practice more than the productive phase (Villegas Mercado, 2010).

Muntzel (1995) argued that “A radical position regarding L2 teaching holds that learning does not contribute to acquisition, that is, conscious gains in linguistic knowledge may not influence unconscious language development”.
The learning of languages shows that the processes are different in the mother tongue and the foreign language, that is, we start at zero with the grammar of our first language, which is acquired in a natural environment. (Muntzel M. , 1995). Gifted with the mother tongue, it inevitably becomes the reference point for learning further foreign languages. Everything is based on the structure acquired in the L1.

According to Agudelo, Díaz and Zavala (2017): the tools and techniques used in the L1 and the L2 are important and above all they go hand in hand which contribute to successful learning and the relationship between the L1 and further languages benefits the student.

Controlled and Uncontrolled Language Acquisition

There are several research studies evidencing that not only differences but also commonalities between foreign language learning in the class and foreign language learning in a natural situation exist. As mentioned by Saxalber (2017) in various situations, “controlled” and “uncontrolled” are nearly identical with “written” and “verbal” production. However, uncontrolled learning generally refers to natural language learning where a learner is not monitored and instructed by an external person. A controlled learning, on the other hand, refers to a process in an educational institution where the student learns rules and concepts of a language and is directly guided.

As an example of controlled learning, Villegas Mercado (2010) mentioned that “vocabulary is important, as well as the teaching and learning of it; the processes that are little observed but necessary to achieve success in the practice of reading and vocabulary in the teaching of a second language. Controlled learning often works against the background of other languages, usually L1 and it is further characterized by an ordered exposure to the data of the language by prescriptive corrections of the learner's instructor.

Peralta Montecinos (2000) stated that:

> The behaviorist position explains the acquisition of language through non-cognitive principles that include association, imitation, and reinforcement. For Chomsky, the human capacity to produce and understand language, and the ability to acquire it, can only be explained by reference to an innate faculty for language. (p. 54)

The linguistic rules of a certain language influence the rules of its grammar, this causes the Chomskian concept of competence and performance to be evaluated as a finite system of rules that generate infinite sentences by which the speaker produces a surface structure, from a deep structure. (Marón Castaño, 2006).

Learning is not the result of environmental stimuli, nor does it have anything to do with genetics, it is actually the relationship between the context and the individual. The use of the L2, in fact if you can speak with foreign people, put the pronunciation of the language into practice, all these processes are part of proper learning. (Bhaszar & Casas, 2015).

In the end, acquisition can be both uncontrolled and controlled in situations where a learner obtains formal instructions and at the same time lives in an environment where the target language is spoken.

SLA Theories

The purpose of learning a second language or a further foreign language is to communicate in compliance with all needs. In the educational field, the importance of learning a second language has always been emphasized, but that this process involves many factors. Learning a second language is closely related to the acquisition of the mother tongue.

According to Merril Swain (2011) “SLA output relies on the L1 speaker's act of preparing himself to produce a proper language, or to what he wants to mean; the output practice can help the learner of an L2 with a different aspect exercise such as metalinguistic that would give him the understanding to reflect on the correct way in which he could pronounce what he intends to say.” (Bhaszar & Casas, 2015)

For a child who learns a second language at a younger stage of age this often will be their second mother tongue. The 2L1 acquisition criterion determines that for a broad definition of early bilingualism the child must learn the two languages (2L1= two mother tongues) after its birth and before it is 12 years of age. Recent studies

show that bilingual children acquire the same proficiency in the phonological and grammatical aspects of their two languages as monolingual children do in their one mother tongue if they are given regular and substantial exposure to both languages.

However, and according to Lenneberg's theory (1967), uncontrolled language acquisition of a L1 or a L2 from mere exposure happens during the so-called “critical period” that begins at the age of two years and ends in puberty. When it comes to the L2 learning of an adult, it is more difficult to learn the language.

As explained by Cook (2003) and cited by Mileva, Garré & Rodríguez (2012) who said that “the L1 of the monolingual speaker differs significantly from the L1 of the bilingual speaker, due to the influence that learning a second language can have on the L1.”

Concerning Friedrichsen (2020), “there are many SLA theories that describe how a second language is learned and used.” It is important to clarify that SLA is a very complex neurolinguistic process and among the different theories there are similarities, overlaps, and differences, yet each theory only seems to capture a certain aspect of learning a second language.

According to Corrales (2009) :

> It expresses the idea of structures above the current level of competition with the formula i+1; that is, the person receives the input from i+1 in order to progress in the development of the language. Therefore, for a second language teacher, it is necessary to know the current level of the learner and give him input a little above his level so that he develops his second language. (p. 161)

Vygotksy (2006), cited by Corrales claims that the mother tongue is the basis for learning a second language, it is difficult to deny that the L1 influences the use of structures, words, and the way of thinking of the learner. The effect that occurs between the two languages is not reciprocal. Furthermore, Corrales (2009) insists

"learners while understanding, manipulating, producing or interacting in the L2 put their attention primarily on the meaning rather than the form." However, the main point is not to learn the second language but to use it in different scenarios and contexts.

Identity Hypothesis

The term "identity" in language learning expresses huge concern while learning an L2 because it reflects by virtue of what a dialect establishes dominant means of defining the singleness of every learner in the surroundings (Dervin & Jackson, 2018).

As explained by Rabiah (2018) language serves as a personal or private identity, and it has an emotive function. Speakers do not just express emotions through language. Therefore, the listener can understand all the emotions of the speakers. Language is a significant trait and shows the identity of people since it is a distinctive acquired in the premeditated domain of people. The approach of speaking conveys much about our own since particularly not at most the expression of our distinctiveness, but specifically part of it.

The identity hypothesis by Stoller (2006) is a theory "which only works under natural, i.e. immersion, conditions, and states that the learning of language as L2 is isomorphic to the L1 acquisition processes". Furthermore, the identity hypothesis claims that the chronology of language learning will be that of normal target language learning and will not be guided by the L1, which of course implies that there is no transfer from the L1 (Stoller, 2006).

Subsequently, the identity hypothesis shows its consistency that same language procedures as in L1 are involved in L2 learning. Even though, rarely various learners of second language may be able to achieve fluency as a native speaker. Since all learners have different perspectives and learning abilities, the learning of an L2 language should be the same process of learning the L1. For instance, for a child to learn L2 at a proficient level, and pronounced as a native speaker, must learn the

fundamentals and theories of the specific language. While adults only need respective words of the language being learned and be surrounded by the L2.

For that reason, the consequences in the learning process are various. The L1 is easily acquired and perfect pronunciation is reached during the various steps of L1 phonological acquisition. However, there are some rare cases where learners learn the L2 short of any accent and achieve a respected level of proficiency.

Contrastive Analysis Hypothesis (CAH)

Transfer from L1 to L2 and other foreign languages has been a controversial issue in the linguistic field of language learning. These processes allow us to analyze the influence that the mother tongue has in the learning of a second language and examine the similarities and differences between the two varieties.

Difficulties while learning a second language can be derived from several differences that are in between the target language and the first language of a speaker. Amidst the common observed mistakes in non- native English in where it has been argued are due to the language transfer and are well-known subject-verb disagreement and misapplying determiners. (Namazian Dost & Bohloulzadeh, 2017)

The contrastive language in linguistics got its impetus in the development of effective and inexpensive foreign language teaching materials. These materials are produced based on the language being taught with subtle comparison to the student's mother tongue (Mahboobeh, 2015). It is stated that learning can only act as a monitor in which corrections can be made on speech, the learning "initiates" the verbal expressions so that they are responsible for the second language and fluency (Muslimawi, 2013).

1.3 Terminology

Language Transfer

Investigations on language transfer show that when learning a foreign language there is always influence, positive or negative, from a learner´s first language. Positive transfer occurs when learning is facilitated due to similar structures in phonological features, morphological or syntactic speech patterns in the two languages. However, learning certain features become extremely difficult when the structures between L1 and L2 differ in some aspects or are completely divers what we call “interference”.

Another factor is the so-called linguistic interdependence which is the need to consider the notion of transfer of linguistic knowledge and patterns from one language to another. In addition, the materials and strategies that a learner uses are a part of the learning process and could help to avoid transfer mistakes. Studies on transfer show that, during the process of learning a second language, not only the mother tongue can influence the second language, but the L2 can also influence the first language”.

Interference

As mentioned, “interference” in language learning explains the process of negative language transfer from one language to another. When a L1 Spanish speaker learns L2 English, the position of an adjective in the L2 is pre-nominal as in >new car< >carro nuevo<. However, in Spanish in most of the examples the position of an adjective is post-nominal which could lead to interference in L2. Several studies conclude that the more differences there are between languages the greater the degree of interference and the learning problem in the second language is.

Based on the thoughts of Diaz & Álvarez (2013) interference also refers to the “reorganization of models that results from the introduction of foreign elements in the most structured areas of the language, such as the phonetic system,

morphology and syntax, and some areas of vocabulary. Interference in the field of phonology is related to the fact that there are phonemes in the new language that do not occur in the L1 or are produced differently and are therefore imitated as the closest L1 sound as in the case of English initial diagraph >th< in >them< /θɛm/ and the Spanish word >demás< /de 'mas/. An English student, especially at a lower level, with L1 Spanish tends to replace the phoneme /θ/ by the closest Spanish sound /d/ due to the non-existence of /θ/ in Ecuadorian Spanish.

Inference

The technical term “inference” in foreign language learning talks about cognitive abilities that assist the apprehension to identify unclear information and support learners to discover logical sequences of data. This thinking process happens when a language student is confronted with vocabulary, he or she is not familiar with. The cognitive processes involved in the message are closely related to the concepts previously acquired by the reader. This means that the student understands the concept of "family" from English, as a family, because it has in its cognitive structure the "substance of the idea" family, not because of the denomination itself.

According to the study by Gallego & Mejía (2016):

> There are other types of inferences, which have a value of total, rational and obvious certainty. They are based on people's assertive knowledge, leading to another type of inference: logical inferences. An example of this is: “cars produce carbon dioxide”, and “carbon dioxide pollutes the environment”, then “cars pollute the environment”. (p. 82)

However, this kind of inference incurs knowledge, that is, the reader's memory, which will be modified at the time of the inference, generating new knowledge. In relation to the foreign language of the reader, an example of this occurs when a student, faced with a text, manages to automatically adjust the concepts that he or she reads to those in his mother tongue.

1.4 Phonological Patterns

The term “phonological pattern” generally talks about a variation of the original sound produced or imitated by a learner and the native-like sound the learner is attempting. Jones (2014) explained that the perception and understanding of phonemes which on the phonological basis represent words, support the child's unconscious approach to writing. Moreover, when a child manages to map a graph, so how a sound is presented on the written basis, into a sound, so how a letter must be pronounced, and recognizes regularities in spelling, it independently will be able to communicate new terms. Furthermore, it is relevant to mention that the language in children is consolidated until the age of five for that reason the importance in early language acquisition.

According to Rose & Inkelas the phonological patterns seen in children’s language have been analyzed from a number of different perspectives. Through the relevant literature it manifests itself. while children’s language is somewhat considered as an ‘easier’ version of the second language, there are many phonological patterns encountered in the acquisition that creates difficulties for theories that were developed for more ‘compound’ adult systems. (Rose & Inkelas, 2011)

Phonologists within the generative framework have responded to this drawback in various ways, from being unaware of data acquisition. Chomsky & Halle (1968) talked about the elaboration of phonological models that allow us to see the phenomena observed in children's phonology (Rose & Inkelas, 2011).

The phonetic classification of the European Spanish consonant /θ/

In the Spanish language the composition >th< is a digraph of the Latin alphabet composed of the two letters >t< and >h<. It was formerly used in Latin language to transcribe certain loanwords and borrowings from the Greek language. In earlier times, the Greek phoneme represented by the grapheme >θ< transformed from the original aspirated allophone [t^h] to an unvoiced dental fricative /θ/. In today´s European Spanish, this dental fricative sound /θ/ can be found in words such as

>corazón< /koraˈθon/ ˈheartˈ. This mutation influenced the speech production of the digraph >th<, which began to be used to present the sound /θ/ in some of the varieties that had this transformation.

The phonetic classification of /θ/ in Spanish is that it is a voiceless consonant and occupies the phonetic name “theta”. Voiceless or unvoiced means that the there is no vibration in the vocal folds and Adam´s apple while producing that sound. Furthermore, and as explained earlier, it is one of the fricative approximant dental consonants of Spanish.

In terms of Avila (2003) mentions:

> As we know, in the Spanish language, seseante, has a phoneme that does not exist in the other dialects. In systems where it is not opposed to /θ/, the /s/ phoneme has a scattering field that can range from the interdental to the apico-alveolar articulation. The interdentalized variant of /s/ cannot be included, because it would be equivalent to an allophone of /θ/, no matter how many efforts are made to achieve it. (p. 64)

The phoneme is produced by raising the tip of the tongue against the upper teeth. At the same time, the stream of air that comes up from the lungs is released through the oral cavity and due to a certain pressure by releasing the air through the oral tract, a friction between the tip of the tongue and the upper teeth is produced what makes this sound to be a fricative consonant.

Varieties of the consonant /θ/ in Latin Spanish

In Latin American Spanish, there are different varieties and dialects as in European´s Spanish. Furthermore, in a country´s understanding of a certain phoneme, different interpretations of the same sound can occur, too. In Peninsular Spanish there are the two voiceless fricative phonemes /θ/ as in >*zapato*< /θaˈpato/ ˈshoeˈ and /s/ as >*sopa*< /θ.pa/ ˈsoupˈ. However, in Latin American Spanish, /θ/

>*zapato*< */saˈpato/* and /s/ >*sopa*< */so.pa/* are released as only one single phoneme which is /s/.

In addition, /θ/ and /s/ are termed sibilant fricatives because of the hissing noise that describes them. A sibilant sound is when the tip of the tongue approximates close to the roof of the mouth and then the air is pushed forward through the tongue making a hissing sound. Even though minimal pairs such as >casa< ˈhouseˈ compared to >*caza*< ˈhuntˈ or >*sien*< ˈtempleˈ compared to >*cien*< share the same phonetic realization in Latin American Spanish, their graphemic representation is different.

The English voiceless dental fricative phoneme /θ/ as in >think< /θɪŋk/ can be produced easily by Peninsular Spanish native speakers since the English sound is identical to the Spanish voiceless fricative phoneme /θ/ as in >corazón< /ko-ra-θon/ ˈheartˈ. Nonetheless, this sound is not present in Latin American Spanish >corazón < /ko-ra-son/ which makes the English consonant sound a challenging phoneme for Latin American Spanish natives.

The phonetic classification of the English consonant /θ/

The diagraph consonant >th< in nowadays English language represents different phonemes as in >they< /ðeɪ/ or >thunder< /ˈθʌndər/. It is the most common digraph in order of frequency in the English language. As illustrated by the English words >they< /ðeɪ/ and >thunder< /ˈθʌndər/, both words occupy the same grapheme at their initial position but use, on the phonetic representation basis, a different phoneme. The phonetic classification of /θ/ is that it is a voiceless plosive consonant and the phonetic name is “theta”. Again, voiceless means that there is no vibration in the vocal folds and Adam´s apple while producing that sound. Furthermore, and as explained earlier, it is one of the fricative dental consonants of English. The characteristic of being a voiceless sound and the bigger amount of air released while producing that phoneme differentiates it from its voiced counterpart /ð/.

The realization of this sound in English is close to the one in Spanish. Again, the tip of the tongue is raised against the upper teeth and a certain amount of air is released through the oral tract which causes friction between the tip of the tongue and the upper teeth.

Smith (2009) stated that the voiced and voiceless fricatives /θ/ and /ð/ are two distinctive features found in the English phonology. For that reason, they are quite special and basically only show up in a couple of the world's languages. In some words, these sounds have shown to disappear but not from the entire language. Consequently, in English, the name >Thomas< is correctly pronounced /tamIs/ and not /θamIs/. In these words, the grapheme >th< must be assumed that it previously was pronounced with the dental fricative /θ/, and later, it clearly disappeared (Hattem, 2009).

The Phonetic Classification of the English Consonant /ð/

The English language uses the diagraph >th< to represent the voiced dental fricative sound /ð/, as in >father< /ˈfɑːðə/ or >there< /ðər/. In former times, English has borrowed many different words and therefore sounds from the Greek language including an extensive number of scientifical terms.

In this specific phoneme there has been a loss of its distinction that is called phonemic merger. At times, the changes in phonetics may refer to a phonemic merger, because these changes can contribute to these mergers. For instance, in the early ages of English the /d/ after syllables continued by /r/ were converted to /ð/: módor, >mother<, /ðr/, weder >weather<, etc. Therefore /ð/ has been structured into the language, the reorganization resulted solely in more /ð/ and less /d/ in its distribution of /d/.

As already declared in the earlier subchapter, the diagraph consonant >th< not only represents the voiceless fricative dental consonant /θ/ as in the English word >through< /ˈθru/ but also the softer version of the former sound /ð/ as in >them< /ðɛm/. It is the most common digraph in order of frequency in the English language.

The phonetic classification of the sound /ð/ is that it is a voiced consonant phoneme, and its phonetic name is “eth”. Voiced, compared to unvoiced, means that there is vibration nearby the vocal folds and the Adam´s apple while producing that consonant. Furthermore, and as in the case of its unvoiced counterpart /θ/, it also is one of the fricative dental consonant phonemes of the English language.

Differences of /θ/ and /ð/ clusters in Spanish and English

As illustrated by the English words >the< /ðe/ and >think< /ˈθɪŋk/, both words occupy the same grapheme at their initial position, namely the diagraph >th< but, on the phonetic basis, use different phonemes. This is because of the behavior of the phoneme inventory of English. In the English language, 21 consonant letters are represented by 24 consonant sounds. Besides, in all the varieties of English we can find two kinds of diagraphs. When we talk about heterogeneous diagraphs, we explain a sound that is made up of two different letters as in the case of >th, ch, ng, ph, sh, wh<. In the case of a homogenous diagraph, we talk about one phoneme that is made up of two of the same letters such as in >ss<.

The Spanish phoneme inventory behaves differently from that of English because officially there are 27 consonant letters (you can find answers between 25 and 30) and these official sounds are represented by only 18 consonant sounds. So, in Spanish, for each consonant sound you will see the letter that orthographically represents the phoneme because almost everything is pronounced as written. The Spanish language also offers a range of heterogeneous diagraphs such as >ch< or >gu, qu, ge< that always are followed by a vowel sound as well as homogenous diagraph, >ll, rr, nn, cc<.

English pronunciation, due to its wider range of phonemes, can result complicated to Spanish native speakers because it includes speech clusters where one consonant letter such as >n< can represent two different consonant sounds such as in >nothing< /ˈnʌθɪŋ / so /n/ and >uncle< /ˈʌŋkəl/ so /ŋ/. The same can be observed in the case of the English diagraph >th<. However, in Spanish, we cannot find letters that represent more than one sound as in /n/ >nada< /ˈnaða/ ˈnothingˈ

so /n/ versus /ñ/ >ñaña< so /ɲaɲa/ ˈsisterˈ. There is already a clear distinction on the spelling basis.

The English consonant letter >th< as in >thick< with its two phonetic realizations in many parts of Spain is close to the production of the consonant letter >c, z< as in >gracias< ˈthanksˈ or >azúl< ˈblueˈ and causes less difficulties in its production when the L2 English learner acquired this /θ/ pronunciation cluster from his or her mother tongue. However, in South American Spanish, the phonemes /θ/ and /ð/ are not used and therefore this presents several obstacles for L1 Spanish speakers. The learner not only has to learn that the diagraph >th< is phonetically represented by two different sounds in L2 English, he or she furthermore must learn the different pronunciation features of both sounds.

There is one more challenge for a L2 English learners with L1 Spanish, because as stated by Castillo Lozano (2016) “phonemes like /θ/ and /ð/ are considered phonemes that in their pronunciation are more misleading for English learners; sounds that are initially supplied by the /t/ or /d/ that present distinctive features” (Castillo Lozano, 2016). The consonant /θ/ should be pronounced softly and voiceless to get the exact sound like a native speaker, while the consonant /ð/ should be pronounced hardly and voiced to get its sound. (Nofpian, Imranuddin, & S, 2018).

Therefore, as explained by Blázquez, Dabrowski and Espinosa from comparing the consonantal phonemes that are in English and Spanish, it can be identified that there are phonemes in Spanish that are non-existent in English and phonemes between both languages that are used very similarly. Therefore, where the phonemes of the Spanish language are non-existent in English, the learner will try replacing the similar sounds of the L2 with the ones he may have in his own language. (Blázquez, Dabrowsk, & Espinosa, 2014).

Subsequently, the substitution of the new L2 sounds /θ/ and /ð/ by the closest L1 sounds /t/ and /d/ is a frequent interference that can be observed in many L1 Spanish natives learning English.

Previous Phonological Studies of /θ/ and /ð/ Clusters by L1 Spanish- L2 English Speakers

While learning L2 English, learners may come up with difficulties or struggles regarding a correct pronunciation since there are particular differences with the Spanish language such as apprehension of phonemes, the manner and place of articulation of certain phonemes or the representation of new sound clusters in the L2 that do not exist in the mother tongue. For the later interpretation of the present study´s results and the data´s classification in a broader context, previous research results on the investigation´s issue were drawn on. Goswami and Chen (2010) investigated the English sounds /ð/ and /θ/ as a set of problematic phonemes for Spanish native speakers since the correct pronunciation is considered difficult for L1 Spanish speakers acquiring L2 English.

Consequently, the group of participants were divided into an experimental and a control group. The first experimental group took a pre-test and then received instructions on how to differentiate specific sounds while the control group had normal classes of English. Concluding that it is common for learners of English to commit this mistake which is the mispronunciation of /θ/ and /ð clusters. (Uribe, Fuentes, Vargas, & Rey, 2019)

Concerning the study´s results by Nofpian and Imranuddin, (2018) with L1 Spanish native speakers, L2 English sounds as /θ/ and /ð/ are hard to learn due to their nonexistence in the L1 and therefore present an unfamiliar consonant sound that students have difficulties with. The data show that most L2 English learners pronounced the consonants /θ/and /ð/ incorrectly and hardly ever pronounced them accordingly. Therefore, it has been noticed that L1 Spanish speakers displayed many hardships in pronouncing some English words with /θ/and /ð/ cluster. (Nofpian, Imranuddin, & S, 2018)

Based on the studies realized by (Gilbers, Lowie & Wester, 2007; Peust, 1996; Smith, 2009; H. You, A. Kazemzadeh, A. Alwan, and S. Narayanan, 2009; Rau, Tony, 2009) L2 English learners are more probable to substitute the diagraph >th<

than English native speakers would, and their changes are either diverse or anomalous. Concerning diversity, learners may find the consonant sounds /f/ /s/ or /t/ as well-suited substitutions for the phoneme /θ/ and /v/ /z/ /d/ for the English sound /ð/.

Jenkins (2000) analyzed over a great period different interaction of Spanish L1 speakers in her classes of English as a second language. She emphasized what she called was a problematic discourse, and focused on the problems that were caused by the learners' phonological production. Describing that when most of the consonants were to be substituted by any other consonant sound, in the L2 English learners there was a dropping of intelligibility. There were exceptions to this problem which were the /θ/ and /ð/ sounds, which was established that could be replaced, with a small amount to basically no loss, by other consonants.

Based on the studies by Werker, Gilbert, Humphrey, & Tees, 1981; Werker & Tees,1983, 1984 Lasky, Syrdal-Lasky and Klein (1975) it was investigated and supported that the learner's linguistic features produce various changes in speech sound perceptions. For instance, adults who learn a second language frequently have difficulties or problems with the correct perception and production of sounds which are different in the new language but an allophone which means there can be multiple possible sounds to pronounce a single phoneme is used in their first language.

The study results indicate that participants showed difficulties concerning the phonetic aspects of the voiced and voiceless difference between the two English consonants the /θ/ and /ð/. Students also got confused due to the substitution of the correct sounds /ð/ by /d/ and /θ/ by /t/. Although, there are possibilities in which learners can train effectively these distinct sounds. In a specific timeline and depending on each individual's effort, their abilities can change during the first year. As in the case of young learners (6-8 months) it was demonstrated that infants were able to identify the sounds /θ/ and /ð/ being at English-speaking homes as do native-speaking adults, while English-speaking adults and (10-12 months) English infants couldn´t identify these sounds (Jamieson & Morosan, 1986).

For instance, the voiced phoneme /d/ is used as a voiceless phoneme /θ/ in the word >dare<. Most of Spanish students do not know exactly that the voiced phoneme /d/ and the voiceless phoneme /θ/ have several differences in articulation, specifically at the beginning of words. Cruttenden (2008) indicated that the English consonant sounds /ð/, called “eth”, and /θ/ called “theta”, often provoke a substitutional sound realization in L1 Spanish students. As a result, students replaced the English phonemes by the sounds /s/ and /z/ at the word-ending and by /t/ and /d/ sounds at the word beginning where the sounds rely more on the articulation in which most learners have shown to have difficulty. (Ali Karakaġ & Cehan Sonmez, 2011)

As studied by Kazemzadeh, Alwan & Narayanan (2005) their study demonstrated how L1 Spanish Speakers show the substations of the interdental fricatives /θ/ and /ð/ in a high propensity. This substitution is demonstrated as /d/ for /ð/ and /t/ for /θ/. This is situation that happens frequently and in this study was found that /t/ and /d/ substitution was likely for L1 Spanish speakers learning L2 English.

Considering that /ð/ is more common to happen than /θ/, teachers should take this into consideration and put more emphasis on /ð/ since for L1 Spanish speakers it may seem easy and instinctive to substitute /d/ for /ð/. This is an extraordinarily quick fix and may be one reason why t/d substitutions are higher than any other substitution patterns. (Hattem, 2009)

Computer-assisted pronunciation training

With the use of technology at the service of education, the teaching of foreign languages has taken a gigantic qualitative leap that has meant for teachers and students a change in traditional teaching tools for new ones that facilitate the process.

According to Chapelle (2001-2003), Levy (1997) and Warschauer (2000), cited by Livingstone (2010): “the use of computers in the teaching-learning of languages has generated great changes in the way of teaching and learning second languages -

better learning in less time, longer lasting and improvement in communicative competence".

Another study on that topic by Livingstone (2010) showed that the computer was ideal for carrying out repetitive exercises since the machine, unlike a teacher, can carry out repetitions with the same linguistic material without getting tired or making mistakes, in addition to providing immediate feedback. Additionally, the computer could present such material on an individual basis, allowing students to work at their own pace and paving the way to success.

Livingstone (2010) highlighted that "spoken output requires class assessment technology that is not necessary for the assessment of written output, often including the analysis elements that characterize some of the writing support computational applications". Therefore, it is extremely important to consider the fact that the use of technology in today's society for the use of learning a new language or correct pronunciation can be very useful to students as well as to teachers to be implemented in classrooms. Subsequently, a computer program or any other learning tool can reach a wide range of students, it is an easy way to access since these tools can be used at home at any time and date and the general benefits include a higher level of proficiency when used correctly and regularly.

According to the above, it should be noted that modern computing allows students to practice and obtain feedback on both their written output and their spoken output which could help to obtain a better pronunciation.

Howjsay

Howjsay is a very useful and user-friendly tool that can be found on the internet. The tool can also be downloaded on your computer as well on your cell phone making it easier to have access for the needs of each learner at any times.

The program is helpful and beneficial when a L2 English learner wants to look up a word´s correct pronunciation. The user just needs to write the word into the

Howjsay's browser window and then can click on the play button to listen to the audio examples by native English speakers. Sometimes, there even are different pronunciation examples depending on dialectal differences or distinct varieties of English such as British and North American English. The learner can also find a word´s definition and translation it into several languages.

According to Cabal (2010) this tool can be useful to improve a learner´s pronunciation when applied regularly, and it has been free to access since 2007.

LearningApps

LearningApps is a free and creative online tool. It was designed to create different types of learning activities and can be used by learners in an easy and interactive way. There are many different disciplines available as foreign languages, history, or biology. Every user can create his or her own LearningApps and voluntarily share them with others or not.

The tool provides several tasks to train a foreign language learner´s pronunciation by listening to a word´s correct realization, displaying a simplified phonetic transcription or it helps with the differentiation of similar phonemes.

Considering this tool as useful, it was selected and used for students to correctly identify the phonological patterns of a word so that it gives a clear understanding of what is being learned.

Personalization is one of the key advantages of LearningApps since it is one of the most interactive ways of learning different contents and therefore encouraging learners to use it more frequently. LearningApps is a choice for learners to learn anything in their comfort and on their own. (Apps Chopper , 2021).

There are many benefits of using LearningApps and its development, including knowledge, personalized material for better interaction, online material,

communication, and access to this useful tool for free since 2009 (Apps Chopper , 2021)

CHAPTER II. METHODOLOGY

2.1 Research and research approach

The investigation was carried out through a cross-sectional study which was conducted online and in present form from the end of January to the beginning of March in 2022 determinedly of a quasi-experimental design. The mixed method puts together qualitative as quantitative approaches and offers the best parameters of each and every one. Characteristics of the two approaches, that are important embraced substantial contributions to many research implementing observation and analysis of development and the combination of both allows gaining better findings in the research. Due to this data, this path was the most advantageous for carrying out this project.

The present investigation has been carried out using information from primary and secondary sources concerning the subject of study.

The research methodology is a specific procedure or technique that is used to identify, select, process, and analyze information on a topic, for this research it will be both quantitative and qualitative or mixed, based on the information that was collected. Therefore, the investigator designs a study to ensure that the results are valid and reliable that addresses the objectives of the investigation.

When speaking about the qualitative approach, it is necessary to mention that it is based on the interpretation of the results. Subsequently, the quantitative approach shows the results obtained from the technique that was applied during the project, such as the survey, yielding numerical data that will be analyzed and interpreted.
In detail, this research used a survey assigned to the participants obtaining the qualitative answers concerning the language background L1 considering there were two monolinguals (L1 Spanish, L1 English) and one bilingual groups (L1 Spanish, L2 English). Another instrument was a list of example sentences containing words including the target phonemes presented to the participants which made it

achievable to reach numerical or statistical information to accommodate them in a different way in this same scheme.

Thus, the qualitative section was settled by the acknowledgment made by the participants, and the quantitative part is valued by the numerical quantities inserted in the outcomes of the investigation with PRAAT, a computer software speech analysis program.

The presented investigation tries to establish and analyze interferences from L1 Spanish into L2 English to detect and prove the principal problems of the investigated participants in agreement to what is analyzed in the investigation. The approach is focused in linguistic, since it aspires to detect, clarify, and analyze parameters which arise in the production of speech regarding participants of the problem investigated in this research.

By gaining research data, the researcher examines the focused clusters, the borrowing or overextension of the L1 Spanish consonant sounds /t/ and /d/ for L2 English /θ/ and /ð/ phonemes in English words containing the diagraph >th< in the speech production of the participants' target words. The data were collected twice, once before the online tools were implemented and second after one month of training of the two L2 sounds. There was no interference at any time in the development or use of the tools by the researcher in order to obtain independent results and usable data.

This investigation is both a documentary and field research. It is related to former research such as online studies, research projects and publications concerning the research issue. Besides, it is based on two data collections from the same students of the South American Language Center in the city of Latacunga, Ecuador in January and March, 2022 demonstrating the reason why it is a cross-sectional study.

Population and Sample

Population or universe can be defined as a set of units or items that share some notes or peculiarities that you want to study (Hernandez Blazquez, 2001). The universe or population can be made up of people, animals, etc. (Pineda , Alvarado, & Canales, 1986). Therefore, the present research is extremely important as it provides the exact number of elements which constitutes the universe.

The present investigation was conducted at the South American Language Center in the city of Latacunga, Ecuador in January and March, 2022, where the investigator knows the L2 level of his participants. The participants mispronounced the investigated L2 sounds on several occasions in speaking activities during present and virtual classes, which lead to the decision to investigate the mentioned sounds. As soon as the focus of research was proper for the study, and with the acknowledgment of the adequate authorities of the establishment, the selection of the students for info collection began.

First, students of a B1 English course were asked if they wanted to participate in the research. The researcher randomly picked up six students, two woman and four men to be part of the task group. The students understood they had to read aloud ten sentences with English words containing target sounds. In the end, the researcher had to analyze ten sentences from each of the six students so that there was a total number of 60 sentences from the task group in the first attempt.

The participants of this research made up of one task group and two control groups. The task group consists of six bilingual L1 Spanish, L2 English participants of South American Language Center, Latacunga. The students belonged to the same course and studied L2 English at a B1 level at the time when the data was collected.

Table 1:

Task Group (Bilingual Spanish L1, English L2)

Indicators	Men	Women	Total
B1	4	2	6

Source: Navas, W. (**2022**)

Contrastingly, in the two control groups there are three monolinguals with English L1 and three monolingual speakers with Spanish L1.

Table 2:

Control Group (3 monolinguals English L1 and 3 monolinguals Spanish L1)

L1	Men	Women	Total
English	0	3	3
Spanish	0	3	3

Source: Navas, W. (**2022**)

The bilingual task group and the two monolingual groups made a total of twelve participants as illustrated in the following table (3):

Table 3:

Total of Participants

Task Group	Control Group	Total of participants
6	6	12

Source: Navas, W. (**2022**)

In the present investigation, no sample was drawn due to the reduced number of students who are students at the South American Language Center Latacunga Institute. Therefore, the number of the population will be the same in the sample. It is also important to indicate that that participants from the two monolingual control groups do not possess any expertise of another foreign language. Yet, the bilingual

task group confirms Spanish as the first language and English as a first foreign language, without awareness of other foreign languages. The students of the task group have always learned English in a controlled situation.

2.2 . Data Collection

Techniques and Instruments

To assure every best possible election of the mechanism for the info collection, it is substantial to elect and analyze certain instruments of the investigation which are the research focus, the methodology, the participants, and the objective that is proposed for the development of the research object.

As mentioned by Garcia, Alfaro, Hernanez & Molina (2006):

> One of the methodological challenges that the researcher will face is the elaboration of instruments for the collection of information. Therefore, when we speak of a survey, we will refer to the entire process that is carried out, while the word questionnaire is limited to the form that contains the questions addressed to the subjects under study. (p. 232)

As already explained, one of the instruments for the data collection was a questionnaire to accumulate linguistic background information of the study´s subjects.

The survey is an approach that grants the accumulation of the data through a sequence of questions. In this case, the investigator collected the data stated on the questions about the research issue and principles of the study. The twelve participants, six from the bilingual task group and six from the two monolingual control groups, completed the respective questionnaire for each group with close-ended questions. The questionnaires were completed online on Google Docs where students had to complete the information.

The questionnaires for the data collection of the linguistic background information are illustrated in the coming tables.

Table 4:

Questionnaire 1: Participants of the task group (Bilingual Spanish L1, English L2)

What is your gender?	Male	Female
How old are you?	13-15	16-18
What is your mother tongue?	English	Spanish
What foreign languages do you speak?	English	Spanish
How did you learn English?	Controlled	Uncontrolled
How much English input do you have a week? (Music, movies, classroom situations)	1-6 h/w	>6 h/w
Where do you speak English?	Classroom	at Home

Source: Navas, W. (**2022**)

Table 5:

Questionnaire 2: Participants of the control group (3 monolinguals English L1)

What is your gender?	Male	Female
How old are you?	18-25	25-30
What is your mother tongue?	English	other
What is your birthplace?	The US	Other
Where do you live?	The US	Other

Source: Navas, W. (**2022**)

Table 6:

Questionnaire 2: Participants of the control group (3 monolinguals Spanish L1)

¿Cuál es su género?	*Masculino*	*Femenino*
¿Qué edad tiene?	*18-25*	*25-30*
¿Cuál es su idioma nativo?	*Español*	*otro*
¿Dónde naciste?	*Estados Unidos*	*Otro*
¿Dónde vive?	*Estados Unidos*	*Otro*

Source: Navas, W. (**2022**)

Another important component was the set of ten sentences containing words with the L2 target sounds /θ/ or /ð/ which the participants had to read aloud once before and then after they had used the online learning tools to later guarantee qualitative and usable research data about the investigated issue.

The corpus data was obtained in a semi-spontaneous speech situation which means that while reading aloud the example words from a PowerPoint presentation, the participants were recorded and one sound file per sentence was generated. In case of disturbances or interruptions the procedure was repeated. The audio files were saved on the computer in mp3 format to later be inserted in PRAAT. All these steps allowed to generate qualitative and quantitative information for the results of this study.

The following tables illustrate the set of the ten L2 English sentences containing the two investigated phonemes for the monolingual L1 English control group and the bilingual L1 Spanish-L2 English task group as well as the Spanish examples for the monolingual L1 Spanish control group (see Annexes).

Table 7:

Task Group (Sentences read by the students of The South American Language Center Latacunga)

Number	Sentence
1	Yesterday I saw **them**
2	**They think** too much
3	I **thought** I saw a **thief**
4	I **think** her **birthday** is next week
5	**That** car is near **the** bridge
6	He is playing **with** **the** dog
7	**The** Doctor is pulling his **tooth** out
8	**Those** kids want to use **the** ball
9	Pronounce **the** word **mother**
10	Pronounce **the** word **father**

Source: Navas, W. (**2022**)

Table 8:

Control Group: (Sentences read by monolingual Spanish L1 speakers)

Number	Sentence
1	*El **zapato** es grande*
2	*El **zorro** está en la calle*
3	*Este **día** está soleado*
4	*Cada alumno **hace** la tarea*
5	*Mis **dedos** son pequeños*
6	***Desde** hoy voy a comer sano*
7	*El Docente va a **juzgar** las tareas*
8	*Me gusta la **cerveza***
9	*Tengo un **cinturón** nuevo*
10	*Me comí una **manzana***

Source: Navas, W. (**2022**)

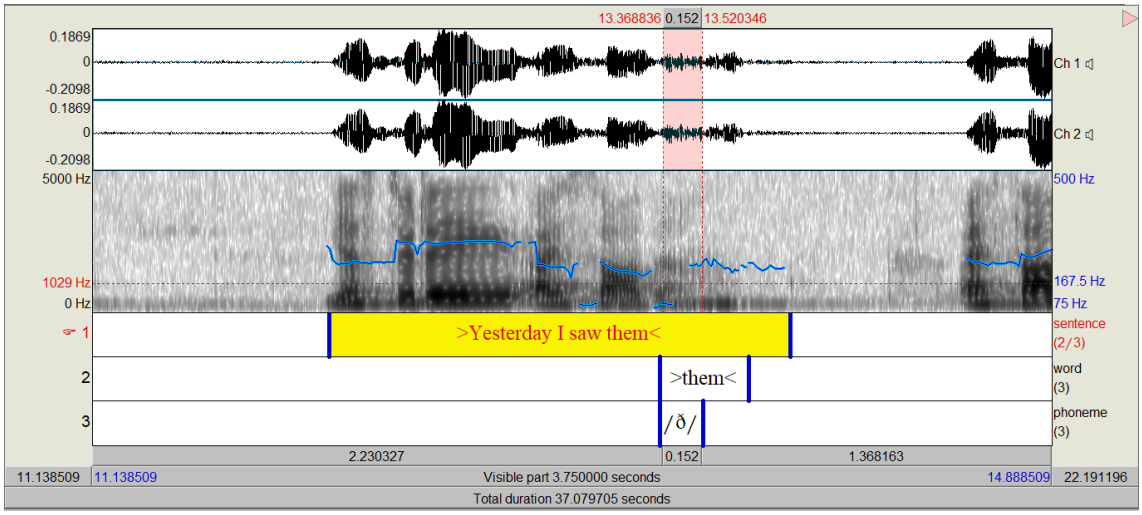
Once the data collection was finished for the first time, the 120 audio files (60 from the bilingual group, 30 from the English monolingual group, 30 from the Spanish monolingual group) were inserted into the voice analysis software program PRAAT and one spectrogram per recording was drawn.

PRAAT is a software that is prominently used by phoneticians and other linguists to visualize speech. So, speech production can be converted into a so-called spectrogram. The help of a spectrogram can visualize different linguistic patterns such as intonation, stress, pitches, vibration frequencies, prosody, and the production of vocalic and consonantal phonemes of a speaker visualized at any point in the syllable, word, or sentence with the pitch track.

Illustration 1 - spectrogram 1 shows the speech sound production of the analyzed English phoneme /ð/ as in the word >them< by a participant of the monolingual control group (L1 English) compared to illustration 2- spectrogram 2 that visualizes

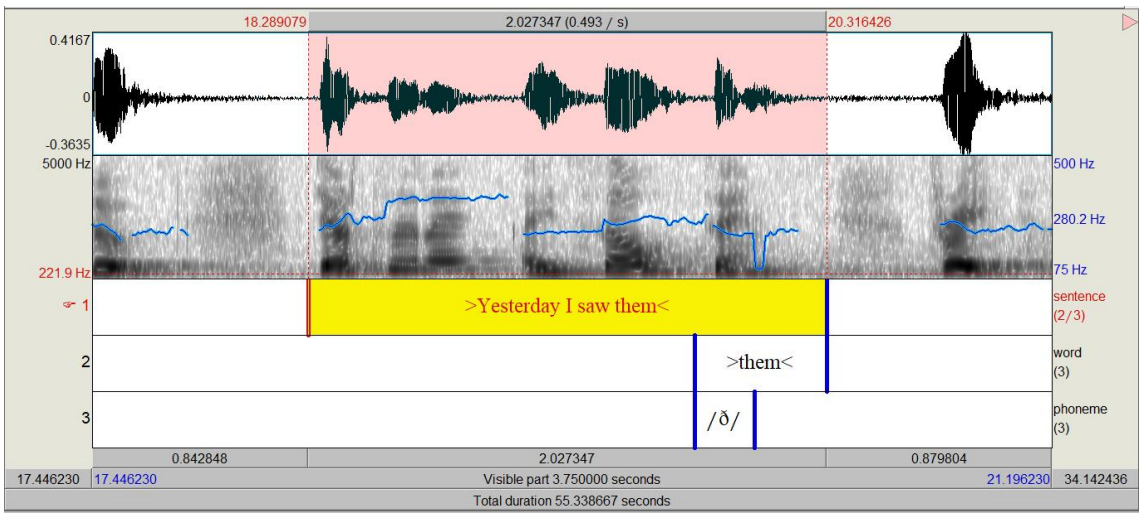
the same English word produced by a participant of the bilingual task group (L1 Spanish, L2 English).

Illustration 1. Spectrogram 1



Source: Navas, W. (2022)

Illustration 2. Spectrogram 2



Source: Navas, W. (2022)

The first spectrogram indicates how a monolingual English native speaker pronounces the phoneme /ð/ as in the word >them< correctly. The sound /ð/ can be described as a voiceless dental fricative sound where the tongue is placed inside the teeth with the blade of the tongue touching the inside of the upper teeth. The spectrogram indicates the correct realization of this phoneme sound in its vertical

dimension (gray part) measured in Hertz that represents the frequency response curve of the vocal tract. The slices indicate amplitude, in which the darker parts show those frequencies, and the brighter slices illustrate waves that have higher amplitude. In the case of the English phoneme /ð/ the voice bar (a “wavy”) amplitude can be observed just before the release of the vowel sound /e/.

However, spectrogram 2 illustrates that the participant of the bilingual task group mispronounces the phoneme /ð/ in the English word >them< and therefore produces a /t/ sound which can phonetically be described as a voiceless fortis plosive alveolar sound where the tip of touches the alveolar ridge. Therefore, there is a different sound production at a different place of articulation in the oral tract. The frequency of the spectrogram indicates the mispronunciation because, as usual for a plosive sound, there is a strong burst in the production of plosive /t/ as shown in its voice bar (the dark gray line) before the onset of vowel /e/.

Once, a researcher got to know how to handle PRAAT, it could be a very helpful tool since it offers you to analyze speech production repeatedly, yielding results and allowing you to compare and thus establish techniques and methods that help you to improve pronunciation. Likewise, PRAAT offers inserting graphic annotation boxes beneath the spectrogram to indicate precisions, orthographic transcription, or phonetic transcription.

Validity and Reliability

The validity is guaranteed if a measurement tool really represents what we are interested in measuring. It is essential to establish the general validity of a method (Middleton, 2019). The validity and reliability allow to accurately measure the variables that arise in the project. The instruments that will be used in the present investigation is the previously structured questionnaire and that each participant will fill it out according to their information and all the instruments will have the validation of the tutor of the research project.

The reliability instead displays the exactness with a set of test scores and what they tend to measure. Validity and reliability serve to correctly quantify the variables that are planted in the investigation. The instruments and methods approached in this research project that are elicit speech (“reading aloud”) and a questionnaire have the validation of the tutor of the research project.

Validator 1: M.A. Melanie Schmidt

The instruments and methods were specified, validated, and piloted the same way the study was conducted to verify their reliability before the corpus data was collected to obtain the necessary and usable results. The six students from the task group were from the same L2 English level B1 and from the same course. They indicated Spanish as their mother tongue and English as the only foreign language. This fact was important to know to clarify or classify possible interferences in the test results. All the participants from the two monolingual control groups assured to not have any knowledge of any other foreign language so that language transfer in their speech production could be excluded.

The validation of the instruments took about three weeks from its application till its approval by the research tutor. During that time, some changes were made regarding the questionnaires to get the linguistic background information of the subjects and the method of the semi-spontaneous data collection, since the example words in the set of sentences were to many and had to be reduced.

After the first recording and generating the first set of spectrograms with PRAAT, the students were motivated to use the technological applications Howjsay and Learning Apps, which were considered to help the students during a period of about one month to improve the pronunciation of the target sounds. After about one month of usage, the participants of the task group were recorded again and there were 60 more spectrograms that are new so that the validation of the instruments and the research data were finished to give way to their application for analysis and interpretation.

Processing and Analysis of Information

For the purpose and an accurate analysis of the present investigation´s data, the linguistic voice analysis program PRAAT which visualizes the produced L2 sounds and therefore can analyze the data was chosen to be the best method and instrument. The audio files (1. session 120 recordings, 2. session 60 recordings) were inserted into PRAAT in mp3 format since the software only accepts specific file formats.

Spectrograms

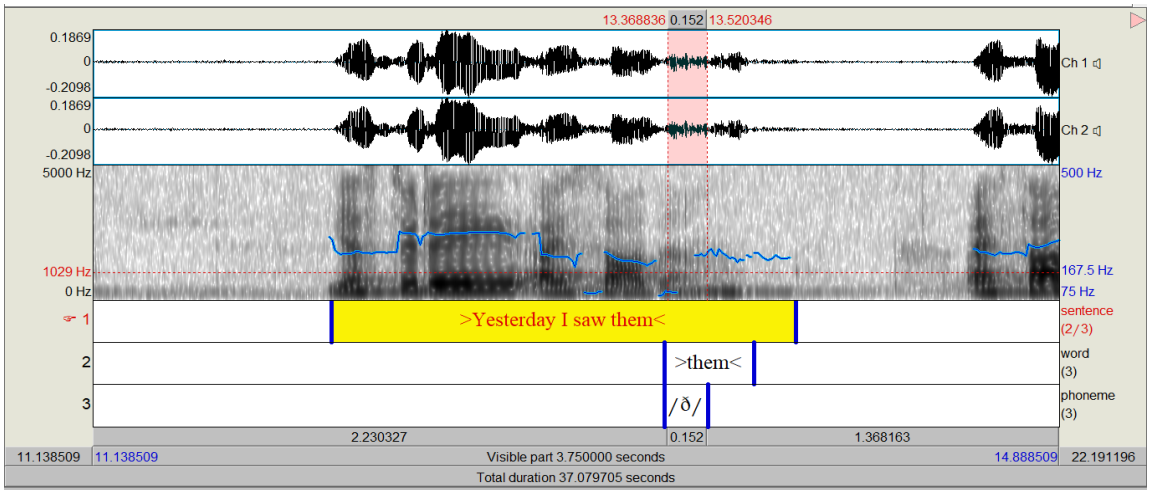
A spectrogram is a visual representation of speech which indicates different linguistic features of languages and their phonological patterns.

According to Martínez Mascorro & Aguilar Torres (2013):

> The spectrogram consists of the graphical representation of the frequency spectrum of the sound emission. The spectrogram can reveal features, such as high frequencies or amplitude modulations, that cannot be seen even though they are within the frequency limits of the human ear. (p. 12)

To create a spectrogram, you first must insert a long sound file in mp3 in the object window called PRAAT Objects. After that first step, you must click on the inserted sound file and at the same time click on “annotate to TextGrid” to get a spectrogram like shown in Illustration 3.

Illustration 3. Spectrogram 3



Source: Navas, W. (2022)

Before starting the analysis and interpretation of the formants and sound waves, it is prelaminar to adjust the parameters and settings according to research´s issue. For this investigation, the categories “sentence, word” and “phoneme” were adjusted so that the produced speech data could be analyzed in its segments and to have a better illustration for the reader where these three different segments start and end in the spectrogram.

Phonetic Transcription

The term “phonetic transcription” generally describes a visual representation of articulatory and acoustic properties of speech data by phonetic symbols.

According to Szczegielniak (2014) it was invented to have a system in which there was a one-to-one correspondence between every sound in the language and every phonetic symbol. On the right side of the speech analysis program, the phonetic functions symbols used for the transcription of the target words are located.

Transcription knowledge of phonetic data must be learned, trained, and sometimes expanded in case of a new sound system and it takes some experience. Doing a phonetic transcription in PRAAT requires prior knowledge and, since it is not only about transcribing. It is also about knowing how to read the single segments as

vowels or consonants in a spectrogram. When a researcher wants to transcribe the sounds from the spectrogram, the latest version of PRAAT offers a broad range of phonetic symbols on the right side of the software. When you analyze the spectrogram, you can zoon in and out to check on the speech in all its details. In this way, you can identify every single phoneme with all its linguistic details separately.

2.3 . Research Proposal

The improvement of L2 English speech patterns by implementing online tools to L1 Spanish speakers

General Information

Location of execution: South American Language Center

Province: Cotopaxi

City: Latacunga

Address: Félix Valencia y Sánchez de Orellana

Area: English as a Foreign Language

Introduction

In the learning of a second language (L2), the mother tongue (L1) has always had great importance and, above all, an impact on the learning of a L2. Students are expelled to new L2 phonological patterns, grammatical structures, pragmatical interpretations concerning vocabulary and even cultural expressions in L2.

However, L2 students are exposed to barriers throughout this process. In the development of this project, the objective is to detect and analyze possible

phonological transfer by L1 Spanish natives at a B1 level of English (L2) regarding the L2 voiceless dental fricative consonant phonemes /ð/, /θ/ at the South American Language Center in Latacunga, Ecuador.

The cross-sectional study will be carried out from January to March 2022 through a quasi-experimental design. The data collection will be based on the students mentioned in the population section, which consists of six students in the task group (L1 Spanish, L2 English), and three monolingual participants (L1 English and L1 Spanish) in the two control groups each. It has a mixed approach, that is, qualitative and quantitative. A speech analysis will be developed in the speech analysis program PRAAT to obtain spectrograms from the corpus data that will be analyzed and interpreted.

The Subject of Investigation and the Research Question

On a worldwide scale, phoneticians and phonologists have investigated the impact of phonological transfer processes from L1 to L2. Furthermore, this field of research has gained considerable importance in foreign language teaching because it is not only said to be one of the most underrated disciplines but at the same time one of the major challenges in L2 acquisition. Especially phonological L1 interferences are a common issue for most L2 learners worldwide that can also be observed among students of various levels of English at the South American Language Center-Latacunga.

A general mispronunciation of the mentioned L2 English speech patterns by the test group of this research due to the non-existence of these sounds in the mother tongue and a false imitation of the non-native English input by Ecuadorian English teachers for years could be one problematic factor. Another problem during the research could be that during the data evaluation participants might feel exposed to an unnatural speech situation where nervousness and dissimulation must be avoided to not falsify the speech data.

Objectives

General Objective

To analyze phonological interferences in L2 English speech production by L1 Spanish students

Specific Objectives:

1. To analyze L2 English speech production of /θ/ and /ð/ by L1 Spanish learners through a voice analysis program.

2. To identify the overextension of L1 sound patterns in L2 English.

3. To create strategies and use online tools that can improve L1 interferences.

4. To share and reflect on the results within the educational community.

The overextension of L1 Spanish speech patterns by bilingual L2 English high school students (English consonant sounds /ð/ and /θ/).

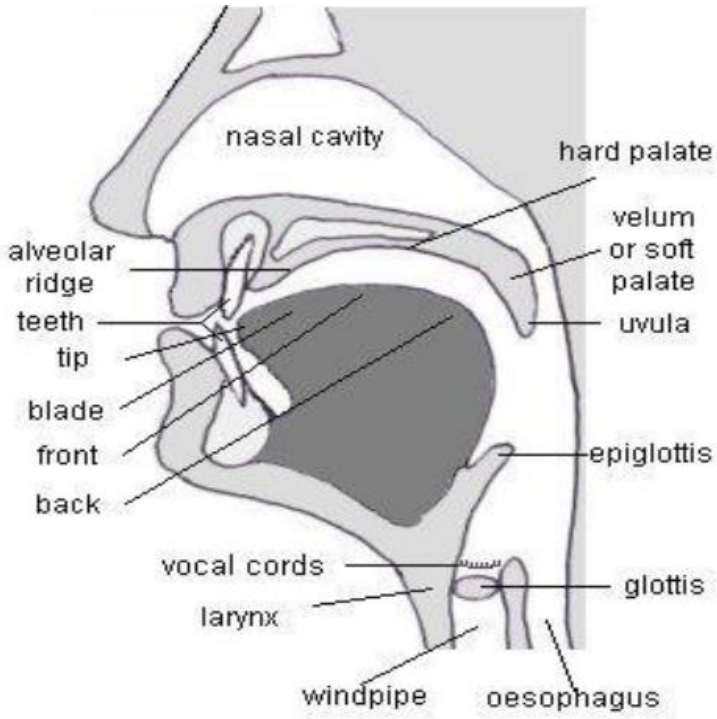
Articulation of sounds

The articulations are instruments that can be used to create a sound such as the use of the tongue and mouth.

In speech production different sounds and other features are released. All the phonemes from different language have various articulations depending on the phonological context and clusters. The movements of the passive and active articulators of the vocal tract and the manipulation of the upcoming airstream from the lungs influence the manner a sound is produced. The entire speech apparatus consists of the resonating cavities, which are the upper part of the larynx, the oral

cavity as the nasal cavity to release oral or nasal sounds depending on if the velum is opened or closed.

Illustration 4. Articulators



Source: **(Abad & Argudo, 2022)**

English and Spanish sounds are very much alike or do have a very similar productions as in the case of initial nasal sound /m/ in English >mother< /ˈmʌðər/ and Spanish /m/ in >madre< /ˈmaðre/. However, there are different manner and places of articulation in the different phoneme consonants and vowel sounds of both languages that differ and therefore are produced slightly or completely different as in the case of English velar nasal sound /ŋ/ as in >uncle< /ˈʌŋkəl/ and the Spanish palatal nasal >enseñar< /ˈenseˈɲar/ ˈto teachˈ. Both share the same manner of articulation but have different places of articulation, since one is velar and the other one is palatal, which differentiates both sounds from each other. Therefore, in both language clusters, the speech organs produce different phonemes and as a results interferences are possible.

Transfer from the L1 to the L2

An adaptation process is what we call when speech clusters from L1 are overextended into L2. In the case of English /θ/ and /ð/, Spanish L1 speakers produce the L2 phonemes with characteristics of their mother tongue and produce words such as >the< /ðə/ with the nearest sound from Spanish which would be /de/.

According to the Virtual Cervantes Center (2020), the learner transfers from his L1 (or from any other language) to the SL is the same or, at least, sufficiently similar in both languages, the result of the transfer process is successful and we speak of positive transfer.

The acquisition of the L2 as a creative process is similar to the L1. In this case the learner starts from the knowledge acquired in his L1 and from his contact with the L2. During the time that the student learns a second language, he goes through different stages that represent a series of challenges. (González & Algara, 2010)

Consequently, the term Transfer has been defined as the transfer of first language elements or patterns into the speech of second language. This can be either or positive or negative depending on the situation being transferred from learners. Therefore, if the result shows errors than it is a transfer with negative meaning. (Ghilzai, 2014)

Dulay, Burt and Krashen (1981) further claimed that L2 acquisition follows not only the same path as L1 acquisition but that L2 learner errors are very similar to L1 learner errors; they are mainly developmental and not transfer errors. This is a point of view that demonstrates how each learner has different approaches in learning which may affect and differentiate that all learners do not learn the same but have similar ways of acquiring the L2 language. (Khaled Karim, 2013)

Procedure

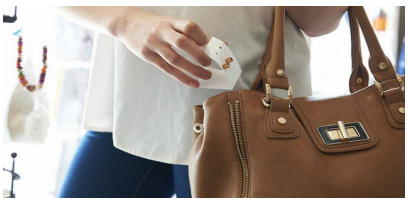
For the present investigation of the L2 English diagraph >th< all the lexical items that show this characteristic were counted for the corpus data. In total, there were 114 clusters (19 items *6 students) from ten example sentences containing 19 items with the research issues in the speech production of the six bilingual participants (see table 9) and 57 occurrences (19 items *3 students) were produced by the three monolingual L1 English subjects. The 114 clusters were produced twice by the task group, once before and then after the period of usage of the online tools so that for the task group there were 228 segments in PRAAT to be analyzed in 120 spectrograms.

The lexical items were classified according to the two dental fricatives consonant phonemes /θ/ or /ð/, to check if there are percentage differences in the mispronunciation in one of the two sounds.

The set of Spanish example sentences produced by the second control group L1 Spanish only served to compare speech data in clusters where in European Spanish a similar speech sound production would be expected as in >cielo< /θ/ /ˈθjelo/ ˈheavenˈ, ˈskyˈ or a plosive sound as /t/ or /d/ was produced.

Table 9:

Sentences read by 6 bilinguals Spanish L1/English L2 and 3 monolinguals English L1. (90 speech productions)

Words containing >th<		
Consonant cluster	Word	Sentence
/ð/	**Them**	Yesterday I saw **them** 
/ð/ /θ/	**they** **think**	**They** **think** too much 
/ð/ /θ/	**thought** **thief**	I **thought** I saw a **thief** 
/θ/ /ð/	**think** **birthday**	I **think** her **birthday** is next week 

/ð/ /ð/	**that** **the**	**That** car is near **the** bridge 
/ð/ /ð/	**with** **the**	He is playing **with the** dog 
/ð/ /θ/	**the** **tooth**	**The** doctor is pulling his **tooth** out 
/ð/ /ð/	**those** **the**	**Those** kids want to use **the** ball 
/ð/ /ð/	**the** **mother**	Pronounce **the** word **mother** 

/ð/ /ð/	**the** **father**	Pronounce **the** word **father** 

Source: Navas, W. (**2022**)

Table 10:

Sentences read by 3 monolinguals Spanish L1. (30 speech productions)

Words >ð< and >θ<.		
Consonant cluster	**Word**	**Sentence**
/θ/	***Zapato***	*El **zapato** es grande* 
/θ/	***Zorro***	*El **zorro** está en la calle* 

/ð/	***Día***	*Este **día** está soleado* 
/s/	***Hace***	*Cada alumno **hace** la tarea* 
/ð/	***Dedos***	*Mis **dedos** son pequeños* 
/ð/	***Desde***	***Desde** hoy voy a comer sano* 

/θ/	***Juzgar***	*El docente va a **juzgar** las tareas* 
/θ/	***Cerveza***	*Me gusta la **cerveza*** 
/θ/	***Cinturón***	*Tengo un **cinturón** nuevo* 
/θ/	***Manzana***	*Me comí una **manzana*** 

Source: Navas, W. (**2022**)

CHAPTER III. ANALYSIS OF THE RESULTS OF THE RESEARCH

3.1. Analysis of the Results

Before the online tools were implemented in the student´s study routine for about one month and before the instrument was executed for the first time, the research issue had not been explained in detailed to the probands of the task group. The participants only were asked to read aloud in a natural way a set of sentences given as the instrument in their mother tongue (monolinguals) and in case of the task group in the L2 English. Before applying the online tools regularly for one month, the research issue was explicitly explained to the probands so that the focused phonemes were clear. After four weeks, the task group repeated the process of reading aloud the same example sentences and students were recorded again.

In total, the students of the task group had to read 10 English sentences containing 6 examples of the English phoneme /θ/ and 13 times the sound /ð/. The researcher chose the example sentences in advance and the probands were recorded while reading the examples to get the research data.

The monolingual English control group read aloud once the same 10 example sentences as the task group and the monolingual Spanish control group read aloud once a set of 10 Spanish sentences mainly containing the Spanish phonemes /s/ and /d/ which are related to the mispronunciation of the investigation’s focus /θ/ and /ð/ in case of bilinguals.

From the universe of the population that was taken into consideration to form part of the object of this investigation, it is gathered in table 11 that 86% of the occurrences of the L2 sound /θ/ were mispronounced by participant #1 BI (before implementation) while only 14% of the same phoneme did not show this negative interference. This circumstance supports the fact that there is a misuse of this phoneme in L2 English by foreign language learners. Therefore, the Spanish labiodental sound /t/ is used instead of the correct English phoneme /θ/ as in the word >thunder< /ˈθʌndər/ (see all spectrograms in Annexes 5).

Table 11:

Participant 1, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 1	Female	Yes	5	86%
		No	1	14%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Subsequently, after the use of online tools that were provided to improve the clear misuse of the English consonant /θ/, it is demonstrated in table 12 that participant # 1 improved in 66% of the cases AI (after implementation) and only misused the sound in 34% of the occurrences. Taking into consideration that before the use of online tools participant #1 misused 5 out of 6 words containing the phoneme /θ/ and after using online tools for approximately one month of period the same student only misused 2 out of 6 words containing phoneme /θ/ this is a positive progress.

Table 12:

Participant 1, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 1	Female	Yes	2	34%
		No	4	66%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Contrarily to the first sound, it is collected that 90% of the words pronounced by student #1 have a clear misuse of the English consonant /ð/, while only 10 % of the student´s production does not demonstrate having this problem. This data also

implies that this is a general mispronunciation in L2 English words. Including the phoneme /ð/ and the result could be since the dental fricative phoneme /ð/ is not present in the first language, alternately, the correct sound was replaced by using the Spanish sound /d/ in English words such as >them< and the result when pronouncing is /ˈdem/ instead of /ˈðem/. Consequently, before receiving tools to help in pronunciation student #1 failed 12 out of 13 times pronouncing words containing the phoneme /ð/.

Table 13:

Participant 1, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 1	Female	Yes	12	90%
		No	1	10%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

After having trained with the online tools, student #1 mispronounced the phoneme /ð/ only 3 out 13 times (23%) and therefore improved by 77% which is a considerable result (see table 14).

Table 14:

Participant 1, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 1	Female	Yes	3	23%
		No	10	77%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

In case of participant #2 it can be observed in the following table 15 that in 83% of the phoneme´s /θ/ appearance, the student showed a clear misuse of this English consonant sound, while only 17% was pronounced correctly which means a failure in 5 out of 6 times. Again, the Spanish labiodental sound /d/ is used instead of the correct English phoneme /θ/ as in English >think< /tɪŋk/. This is due to the fact, that the student intended to facilitate the pronunciation of this phoneme that does not occur in her mother tongue.

Table 15:

Participant 2, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 2	Female	Yes	5	83%
		No	1	17%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

After student #2 used the online tools for approximately one month and as shown below in table 16, she only failed in 1 out of 6 example words containing the English consonant phoneme /θ/, using it correctly in 83% of the times and only mispronouncing 17% of the cases.

Table 16:

Participant 2, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 2	Female	Yes	1	17%
		No	5	83%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Table 17 indicates that 85% of the words pronounced by student #2 have a clear misuse of the English consonant sound /ð/. In total, the student failed in pronouncing 11 out of 13 times when the phoneme /ð/ occurred.

Table 17:

Participant 2, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#2	Female	Yes	11	85%
		No	2	15%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

After student #2 used the online tools, she only failed in the production of 2 out of 13 words with the phoneme /ð/. Demonstrating that 85% of the words containing the phoneme /ð/ were used correctly, while only 15% were improperly used.

Table 18:

Participant 2, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#2	Female	Yes	2	15%
		No	11	85%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

In table 19, before the use of online tools student #3 displays a 100% of mispronunciation of the English consonant /θ/ which means that she failed in 6 out of 6 words. This data indicates a clear difficulty in the proper pronunciation of English words in this particular sound as in all of the times.

Table 19:

Participant 3, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 3	Female	Yes	6	100%
		No	0	0%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

After the implementation of the online tools for about four weeks, table 20 indicates a better performance in English words containing the phoneme /θ/ where student

#3 only failed 1 out of 6 words, demonstrating that 83% of the words were now used correctly while only 17% were produced incorrectly.

Table 20:

Participant 3, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 3	Female	Yes	1	17%
		No	5	83%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Regarding the data of table 21, it is collected that 77% of the words pronounced by student #3 have a clear misuse of the English consonant phoneme /ð/, while only 23% do not demonstrate having this problem. This shows that student #3 failed in pronouncing 10 out of 13 cases where the phoneme /ð/ appeared.

Table 21:

Participant 3, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#3	Female	Yes	10	77%
		No	3	23%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Subsequently, after student #3 used online tools to train the awareness and therefore production of the English consonant sound /ð/, it can be observed in the

below table 22 that in 77% of the examples, the phoneme was used correctly while only 23% were still used incorrectly, failing in 3 out of 13 words times.

Table 22:

Participant 3, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#3	Female	Yes	3	23%
		No	10	77%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Table 23 points out that there is a mispronunciation of the L2 phoneme /θ/ BI in 100% of the cases by student #4. A clear misuse of the English consonant sound can be determined since student #4 failed in 6 out of 6 examples and replaced the phoneme by the Spanish labiodental sound /t/.

Table 23:

Participant 4, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 4	Male	Yes	6	100%
		No	0	0%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

However, after the implementation of the online tools, student #4 improved his pronunciation in words containing the phoneme /θ/ by 50%. It was collected that

student #4 only mispronounced 50% of the phonemes while the other 50% were used correctly, which for this student, is a good result.

Table 24:

Participant 4, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 4	Male	Yes	3	50%
		No	3	50%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Table 25 indicates that 69% of the phoneme´s occurrences pronounced by student #4 BI have a clear miss use of the English consonant sound /ð/, while only 31% do not demonstrate this interference. Student #4 failed in 9 out of 13 words containing the phoneme /ð/.

Table 25:

Participant 4, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#4	Male	Yes	9	69%
		No	4	31%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

After student #4 used the online tools provided for the determined period, the below table 26 demonstrates that in 75% of all the occurrences of the phoneme /ð/ the

sound was used correctly, while only in 23% of the cases the same sound still was mispronounced which are 3 out of 13 cases.

Table 26:

Participant 4, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#4	Male	Yes	3	23%
		No	10	77%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

As demonstrated in table 27, it is gathered that before the use of the online tools 83% of the words pronounced by student #5 have a clear misuse of the English consonant /θ/, while only 17% of the phonemes were produced in a correct way.

Table 27:

Participant 5, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
#5	Male	Yes	5	83%
		No	1	17%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

In case of participant #5 it can be observed that AI in 67% of the cases the English phoneme was produced correctly and only 33% were still mispronounced, failing in 2 of the 6 times.

Table 28:

Participant 5, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
#5	Male	Yes	2	33%
		No	4	67%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

From the data collected in table 29, it is shown that BI 85% of the cases where the English phoneme /ð/ was used were mispronounced by proband #5 since he failed in 11 out of the 13 cases. Ultimately, only 15% of the times the consonant sound was realized correctly

Table 29:

Participant 5, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#5	Male	Yes	11	85%
		No	2	15%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Student #5 AI produced the English sound /ð/ in 77% of the example words correctly while only 23% of the occurrences were still mispronounced.

Table 30:

Participant 5, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#5	Male	Yes	3	23%
		No	10	77%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

As in the case of participant #4 the same results are obtained with proband #6. Before the online tools were implemented and regularly used, the student failed in a 100% of the correct production of the English dental fricative sound /θ/ since interference took place in 6 out of 6 examples. Again, the Spanish labiodental sound /t/ was used instead of the correct English phoneme.

Table 31:

Participant 6, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
#6	Male	Yes	6	100%
		No	0	0%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Consequently, and as shown in table 32, AI the participant #6 realized 83% of the examples of the phoneme /θ/ in a correct way, while only 17% of the occurrences were still mispronounced.

Table 32:

Participant 6, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
#6	Male	Yes	1	17%
		No	5	83%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Table 33 indicates that before the use of the online tools 92% of the examples of /ð/ were mispronounced by student #6 while only 8% of the same phoneme was realized correctly since the student #6 failed in 12 out of 13 times.

Table 33:

Participant 6, task group, BI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#6	Male	Yes	12	92%
		No	1	8%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Subsequently, after student #6 used the online tools and as displayed in table 34 the participant improved in the realization of words containing the phoneme /ð/, since he 85% of the occurrences of the investigated phonemes were produced without any interferences from Spanish, while only 15% of the examples were still used incorrectly. In the second recording, proband #6 only failed in 2 out of the 13 examples of the phoneme /ð/.

Table 34:

Participant 6, task group, AI (Bilingual Spanish L1, English L2)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
#6	Male	Yes	2	15%
		No	11	85%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Control Group (Monolingual English L1)

From the universe of the population that was taken into consideration to form the monolingual English control group of this investigation. In total, the three students of the control group had to read aloud 10 English sentences containing 6 examples of the English phoneme /θ/ and 13 sets including the sound /ð/. The researcher chose the example sentences in advance and the probands were recorded while reading the examples to obtain the research data. The control group used the same instruments as the task group.

It is shown in table 35 that 0% of the 6 occurrences of the English consonant sound /θ/, pronounced by the L1 English native participant #1 were mispronounced, while 100% were realized correctly.

Table 35:

Participant 1, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 1	Female	Yes	0	0%
		No	6	100%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Table 36 indicates the same results but for the second sound. Participant #1 had a 0% failure in the 13 occurrences of the English consonant sound /ð/. Consequently, a 100% were realized in a correct way.

Table 36:

Participant 1, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 1	Female	Yes	0	0%
		No	13	100%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

The results of proband #2 in table 37 also show that 0% of the 6 occurrences of the English consonant sound /θ/ were mispronounced, and that 100% were pronounced correctly by the English native speaker.

Table 37:

Participant 2, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 2	Female	Yes	0	0%
		No	6	100%
		Total	**6**	**100%**

Source: Navas, W. (2022)

As in the previous case, it can be deduced with the data in table 38 that 0% of the examples pronounced by native #2 were realized incorrectly, while 100% of the set was pronounced in a correct way.

Table 38:

Participant 2, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 2	Female	Yes	0	0%
		No	13	100%
		Total	**13**	**100%**

Source: Navas, W. (2022)

The information obtained from participant #3 in table 39 displays the similar results as 0% of the 6 occurrences of the English consonant sound /θ/ were mispronounced, while 100% were realized correctly.

Table 39:

Participant 3, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /θ/?	Number of words	Percentage
# 3	Female	Yes	0	0%
		No	6	100%
		Total	**6**	**100%**

Source: Navas, W. (**2022**)

Table 40 again indicates that 0% of the examples including the English consonant sound /ð/ pronounced by participant #3 display a wrong realization of that sound. Consequently, a 100% of the 13 occurring examples were pronounced correctly.

Table 40:

Participant 3, control group (Monolingual English L1)

Participant	Gender	Is there a mispronunciation of /ð/?	Number of words	Percentage
# 3	Female	Yes	0	0%
		No	13	100%
		Total	**13**	**100%**

Source: Navas, W. (**2022**)

Control Group (Monolingual Spanish L1)

The three probands in the monolingual Spanish control group completed the same task as the previous groups. They read aloud a set of 10 Spanish sentences focusing on words that contain the Spanish phonemes /s/ as in the initial position of >zapato< ‘shoe’ or >cinturón< ‘belt’. Later, the sounds /d, t/ as in >dedo< ’finger’ since these are related to the mispronunciation of the research’s issue and, on a phonological basis, are the equivalents to English phonemes /θ/ and /ð/ for the L1 Spanish, L2 English bilinguals.

It is shown in table 41 that 0% of the 8 occurrences of the Spanish consonant sound /s/, pronounced by the L1 Spanish native participants #1, #2 and #3 were mispronounced, while 100% were realized correctly.

Table 41:

Participants, monolinguals Spanish L1 control group

Participant	Gender	Is there a mispronunciation of /s/?	Number of words	Percentage
# 1	Male	Yes	0	0%
		No	8	100%
		Total	**8**	**100%**
# 2	Male	Yes	0	0%
		No	8	100%
		Total	**8**	**100%**
# 3	Male	Yes	0	0%
		No	8	100%
		Total	**8**	**100%**

Source: Navas, W. (2022)

As in the former case, it can be deduced with the data from table 42 that 0% of the examples of the Spanish sound /d/ pronounced by the native speakers #1, #2 and #3 were realized incorrectly, while 100% of the set was pronounced in a correct way.

Table 42:

Participants, monolinguals Spanish L1 control group

Participant	Gender	Is there a mispronunciation of /d/?	Number of words	Percentage
# 1	Male	Yes	0	0%
		No	4	100%
		Total	**4**	**100%**
# 2	Male	Yes	0	0%
		No	4	100%
		Total	**4**	**100%**
# 3	Male	Yes	0	0%
		No	4	100%
		Total	**4**	**100%**

Source: Navas, W. (2022)

Among the Spanish examples in this research there was one example word >dedo< ’finger’ which represents a phonological specialty of the Spanish language since the second grapheme >d< of the word is not produced in the same way as the initial one. Normally, the spelling and pronunciation in Spanish are straightforward, which is the reason why 100% of Spanish words that include the phoneme /d/ at the beginning of a word are all pronounced in that way.

However, in an intervocalic position the Spanish phoneme /d/ turns into the Spanish allophone [ð]. So, the second >d< in >dedo< is not a phoneme in Spanish such as the first one. The Spanish allophone [ð] is similar, but not close, to the English phoneme /ð/, but it could be considered as an error in pronunciation of bilingual speakers of L1 Spanish and L2 English.

As mentioned, all the monolingual control group participants are Spanish L1 speakers and do not have any understanding of the English language. For that reason, they did not demonstrate the overuse of the English phoneme /ð/ instead of the Spanish allophone [ð] in the intervocalic position of >dedo< but for a complete and transparent analysis of the investigation´s issue this information should be mentioned.

Table 43 shows that the three L1 Spanish native participants #1, #2 and #3 pronounced the only occurring allophone [ð] in the intervocalic position of the Spanish word >dedo< in a 100% correct way.

Table 43:

Participants, monolinguals Spanish L1 control group

Participant	Gender	Is there a mispronunciation of [ð]?	Number of words	Percentage
# 1	Male	Yes	0	0%
		No	1	1000%
		Total	**1**	**100%**
# 2	Male	Yes	0	0%
		No	1	010%
		Total	**1**	**100%**
# 2	Male	Yes	0	0%
		No	1	100%
		Total	**1**	**100%**

Source: Navas, W. (2022)

The general data of the investigation showed that the bilingual task group generated very good improvements comparing the results of the first recording, so BI, to the

second recording, AI. Both, the monolingual English and the monolingual Spanish control groups performed faultlessly as expected.

3.2. Discussion

Based on the investigation's issue, the objectives of this project, the bibliography, and the results gathered during the research process. It can be summarized that there is a clear mispronunciation in the two English dental fricative phonemes /θ/ and /ð/ by the bilingual L1 Spanish, L2 English probands at B1 English level from the South American Language Institute in Latacunga, Ecuador.

Due to interference from Spanish phonology and the non-existence of both sound clusters in Ecuadorian Spanish, the English diagraph >th< represented by the two phonemes /θ/ and /ð/ in English words such as >think< /θɪŋk/ or >them< /ðɛm/ were stated to cause a high rate of interferential language errors in the learning process of L2 English by Spanish native speakers. Both English phonemes were generally replaced by the Spanish dental plosives /t/, in case of /θ/, and /d/, in case of /ð/. The two Spanish plosives phonologically display the closest sounds concerning the production of /θ/ and /ð/ and therefore are frequently used by L2 English learners to replace the two English fricatives.

The importance of learning the English sounds /θ/ and /ð/ is that it allows L2 learners to pronounce English words more native alike. Since, these sounds were easily replaced by the Spanish sounds /d/ and /t/, it is important to learn the correct forms of pronunciation to avoid any type of misunderstandings. This project indicates that the B1 students of the South American Language Center Latacunga need to establish a better pronunciation in these L2 phonemes because it is evident that they are not using correctly the English words including the sounds /θ/ and /ð/.

However, after implementing the online learning tools for a period of about one month, the second set of results by the bilingual task group displayed a very good improvement in the correct production of both English phonemes. After the first recording and before introducing the tools, the researcher guided the six students

from the task group and the research issue was explicitly explained to the probands so that the focused phonemes were clear.

Concentrating on the production and the pronunciation of the indicated sounds resulted in a higher rate of correct sound realization. The importance of learning well how to pronounce the foreign-language sounds /θ/ and /ð/ is that it helps L2 English learners to produce English words correctly, to avoid any type of misunderstandings while speaking English and not to transmit these interferences to other students in conversations, discussions, or any other classroom situation. For the student himself/herself it is also important to avoid a fossilization, which refers to a cognitive process in which incorrect language clusters become a habit and therefore later cannot easily be corrected anymore.

This study could have been improved by providing more time in the usage of the online tools, since it was noticed that within a period of only about one month, there already was a significant and positive advance in the pronunciation of English words containing the sounds /θ/ and /ð/.

The present research could also be extended in the future to get more detailed or wider-ranged results, including more participants, or starting already from an A1 English level, implementing the learning tools that were shown to be useful for the probands of the present study. Moreover, spontaneous speech interactions, not only semi-spontaneous situations as utilized in this research can be included in future analyses to compare speech data from various linguistic sets.

Regardless, the results of this project can already help fellow researchers to imitate related studies or to implement similar strategies such as the usage of online tools to achieve improvements in the pronunciation of the English sounds /θ/ and /ð/ in their Spanish native students.

CONCLUSIONS

- The analysis of the present research project reflects a set of conclusions based on the objectives and the research question of this study, which will be analyzed and described below.

- The data obtained during this research confirmed the research question and showed that L1 Spanish-L2 English speakers displayed native-language interferences in certain L2 clusters. In all the probands from the bilingual task group a L1 speech pattern adoption in the production of the L2 English diagraph >th< was detected. The overextension of Spanish structures provoked a mispronunciation in L2 words containing the phonemes /ð/ or /θ/, which are not present in Ecuadorian Spanish. The two sounds investigated in this research generally are very rare in other languages, such as in Ecuadorian Spanish, and therefore often are replaced by L2 English learners by similar L1 phonemes as in the case of L1 Spanish /d/ in >other< /ˈʌdər/ [correct: /ˈʌðər/] and /t/ in >ethic< /ˈɛtɪk/ [correct: /ˈɛθɪk/].

- Another challenge for the bilingual participants in this study was the fact that the place of articulation of the “interchangeable” phonemes is different in the two languages since in English /θ/ and /ð/ are fricative dental sounds and Spanish /t/ and /d/ are plosive alveolar phonemes without any friction. In Peninsular Spanish the phoneme /θ/ is also a fricative dental and in linguistics it is called “lisp” or “ceceo”, as in the Spanish word >azúl< /aˈθul/ ˈblueˈ. This linguistic feature, which is almost exclusively found in Spain, appears to sound similar to the English phoneme /θ/ as in >ethic< /ˈɛθɪk/ but is not decisive for this study since Latin American Spanish was considered in the present paper.

- While the sounds are produced differently in the specific languages, they cause a high rate of interferences when L1 Spanish speakers do not learn the L2 realizations properly since it could lead to misunderstandings with other English speakers.

- In addition, fossilizations can occur when L1 Spanish speakers use incorrectly the English sounds, and this becomes a habit, stays in their speech production, and cannot be easily corrected.

- Furthermore, the results show that L1 Spanish speakers have difficulties in the moment of pronouncing correctly English words with the phonemes /θ/ and /ð/. Even though there are phonemes in Spanish that are considered to sound similar such as European Spanish /θ/ >zapato< ˈshoeˈ (sometimes there is an overuse of European Spanish even by Latin American Spanish natives when realizing the English sounds) and the Spanish allophone /ð/ as in >dedo< /ˈdeðo/ ˈfingerˈ. Therefore, these similar sounds were not “borrowed” by the learners from the mother tongue to identify and correct the mispronunciation of the English phonemes that are considered difficult due to its non-existence in Ecuadorian Spanish.

- To sum up, the data showed that one of the ways that learners transfer phonological components from their mother tongue to L2 English is through phonemes that for the L1 Spanish speaker sound like the ones present in L2 English words and substitute them by the closest L1 sound units. This is where interferences occur and alter the English phonemes due to the phonemic organization in the mind of the L1 Spanish speaker. The present research´s results support the fact that there is this replacement of the English diagraph >th<, phonologically represented by the two phonemes /θ/ and /ð/, by the L1 Spanish sounds /t/, in case of /θ/ and /d/, in case of /ð/ and confirm the study´s hypothesis. This knowledge can help to develop exercises to avoid the substitution of the wrong phonemes and to focus more on how and why certain sounds in L2 English are substituted by L1 Spanish speakers.

RECOMMENDATIONS

- In this last section, some recommendations concerning how to reduce or avoid the overuse of certain L1 Spanish speech patterns in L2 English /θ/ and /ð production are given.

- In foreign languages there are always new sounds or different phonological clusters as rhythm or stress that are absent or diverse in one's mother tongue. Foreign language teachers must make clear these phonological differences between the L1 and the L2 by pointing out the contrasts as the most challenging sound differences between L1 and L2.

- It is recommended to always focus on the challenging phonemes and their differences, which in this research were the English phonemes /θ/ and /ð/, indicating already at an early level of English learning how to overcome the challenge of mispronunciation of these sounds. English instructors should implement articulatory phonetic exercises on how to avoid or to minimize a wrong phonemic realization of English /θ/ and /ð/ by indicating how and where in the oral tract these specific sounds are produced and how they are produced in the mother tongue if a similar sound exists, as in the case of European Spanish /θ/. If there is no identical sound in the student´s mother tongue, as in the case of English /ð/, the teacher can ask students how they replace the English sound, which would be /d/ for most Spanish natives. Eventually, again do articulatory phonetic exercises as shifting from /d/ to /ð/ focusing on the movement of the tip of the tongue as an active articulator. Every time that the English teacher identifies the mispronunciation of an L2 sound, he/she must repeat the differences in the place or manner of articulation of the L2 phoneme compared to the misused L1 sound to avoid fossilization in the student´s speech production. In these situations, teachers always should give enough example words containing the L2 phonemes and actively practice those using different materials, tools, and strategies.

- Finally, it is suggested to regularly remind students of the phonological differences between L1 and L2 and to periodically evaluate students' performances on challenging English sounds containing the phonemes /θ/ and /ð/.

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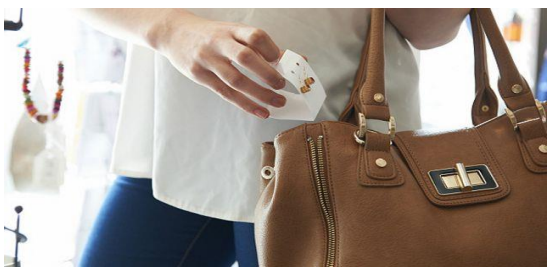
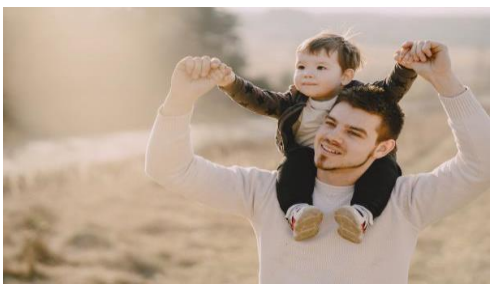
ANNEXES

Annex 1. Sentences for data collection (monolinguals L1 English and bilinguals L1 Spanish- L2 English)

Words containing >th<		
Consonant cluster	Word	Sentence
/ð/	**Them**	Yesterday I saw **them** 
/ð/ /θ/	**they** **think**	**They** **think** too much 
/ð/ /θ/	**thought** **thief**	I **thought** I saw a **thief** 

/θ/ /ð/	**think** **birthday**	I **think** her **birthday** is next week 
/ð/ /ð/	**that** **the**	**That** car is near **the** bridge 
/ð/ /ð/	**with** **the**	He is playing **with the** dog 
/ð/ /θ/	**the** **tooth**	**The** doctor is pulling his **tooth** out 

/ð/ /ð/	**those** **the**	**Those** kids want to use **the** ball 
/ð/ /ð/	**the** **mother**	Pronounce **the** word **mother** 
/ð/ /ð/	**the** **father**	Pronounce **the** word **father** 

Source: Navas, W. (2022)

Annex 2. Sentences for data collection (monolingual L1 Spanish)

Sentences read by 3 monolinguals Spanish L1. (30 speech productions)

Words containing >ð< and >θ<		
Consonant cluster	**Word**	**Sentence**
/θ/	***Zapato***	*El **zapato** es grande* 
/θ/	***Zorro***	*El **zorro** está en la calle* 
/ð/	***Día***	*Este **día** está soleado* 

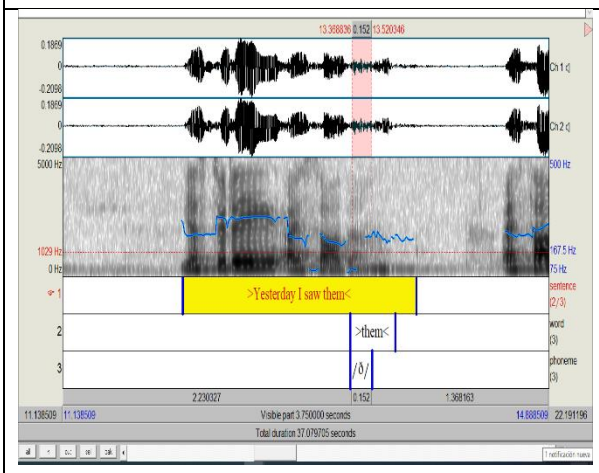
θ/	***Hace***	*Cada alumno **hace** la tarea* 
/ð/	***Dedos***	*Mis **dedos** son pequeños* 
/ð/	***desde***	***Desde** hoy voy a comer sano* 
/θ/	***Juzgar***	*El docente va a **juzgar** las tareas* 

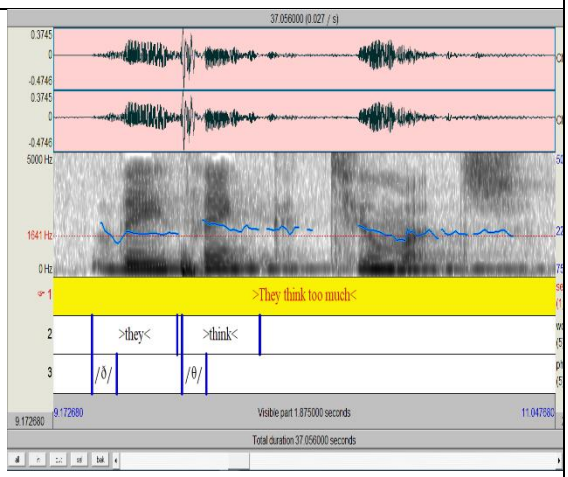
/θ/	***Cerveza***	*Me gusta la* ***cerveza*** 
/θ/	***cinturón***	*Tengo un* ***cinturón*** *Nuevo* 
/θ/	***manzana***	*Me comí una* ***manzana*** 

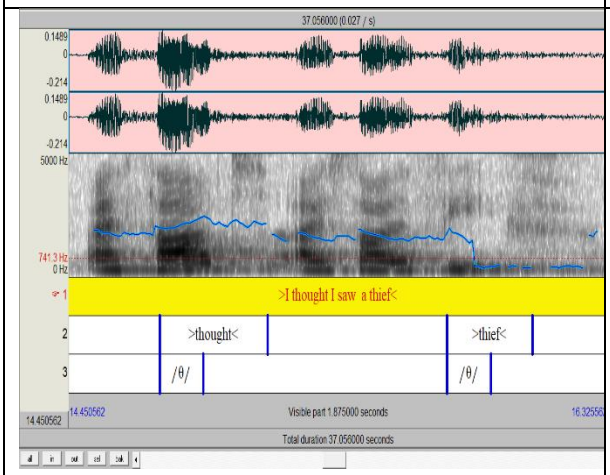
Source: Navas, W. (2022)

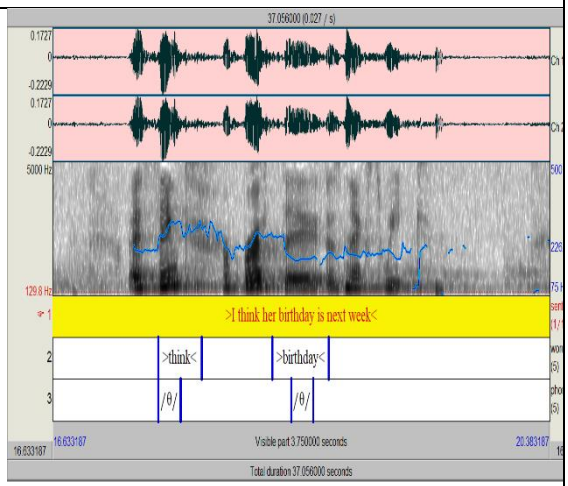
Annex 3. Spectrograms of the control group (monolinguals L1 English)

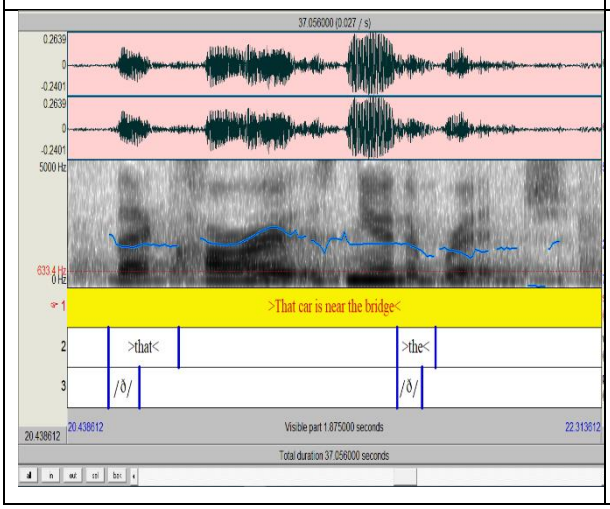
Participant 1, Monolingual L1 English

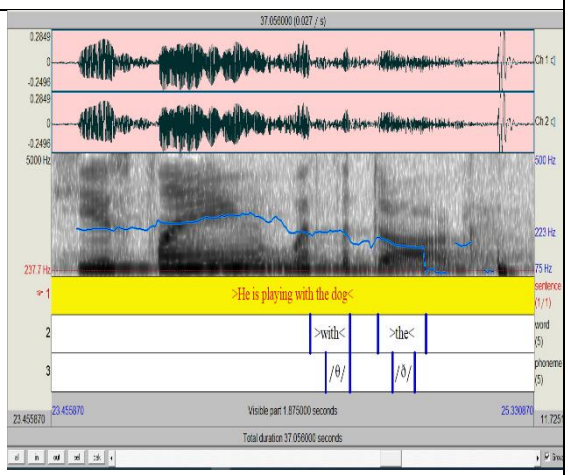


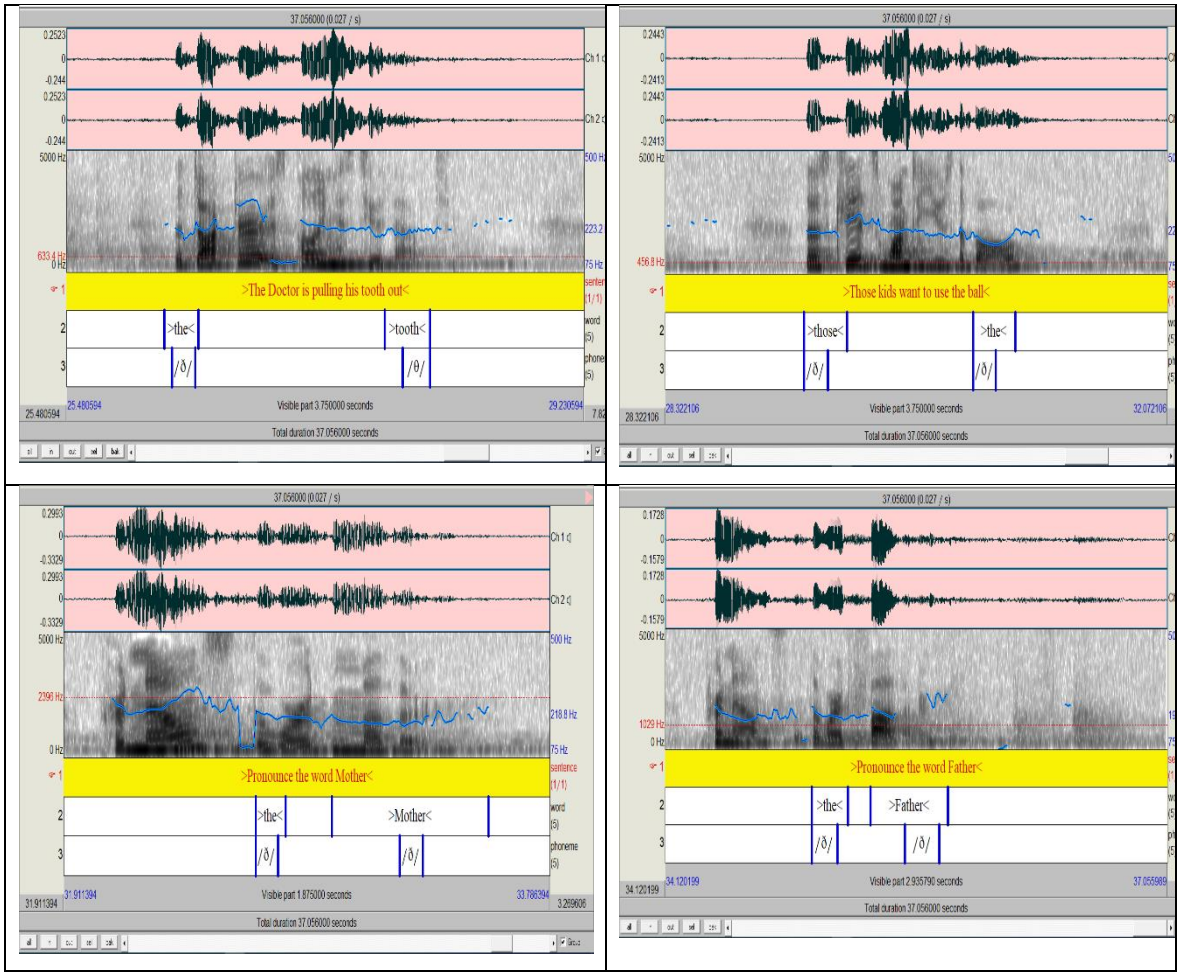






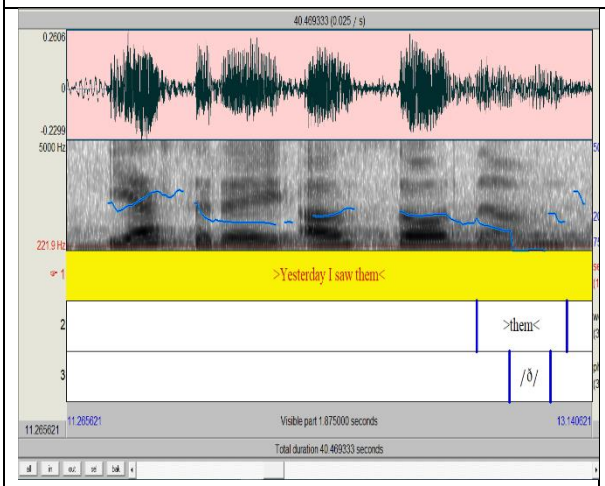


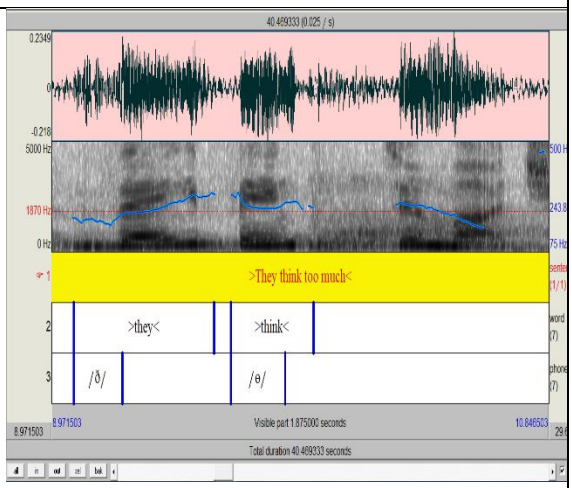


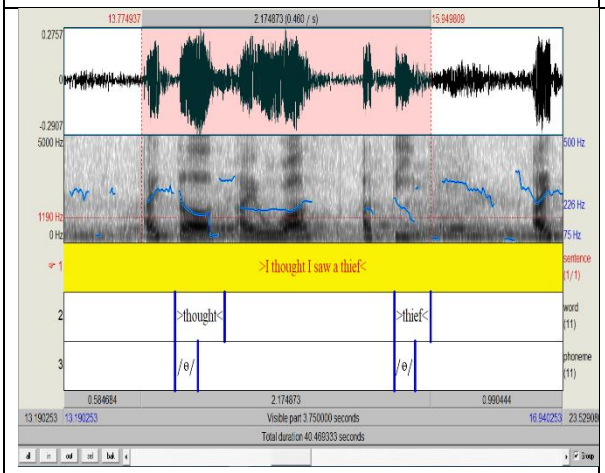


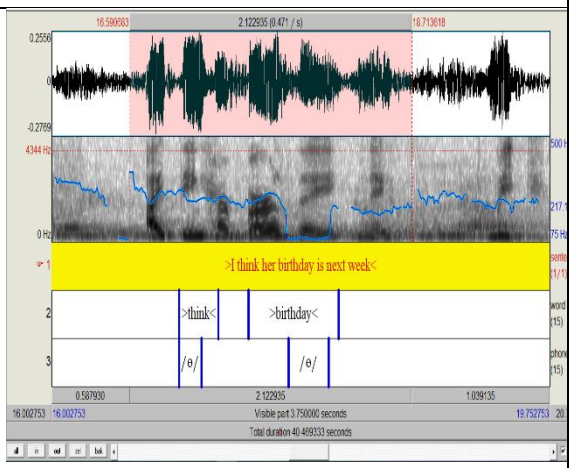
Source: Navas, W. (2022)

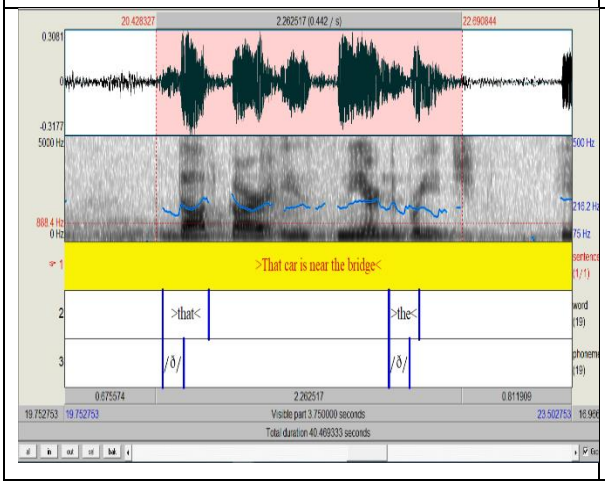
Participant 2, Monolingual L1 English

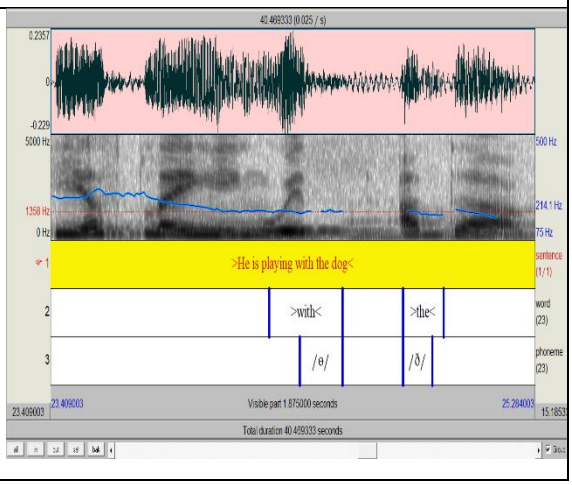


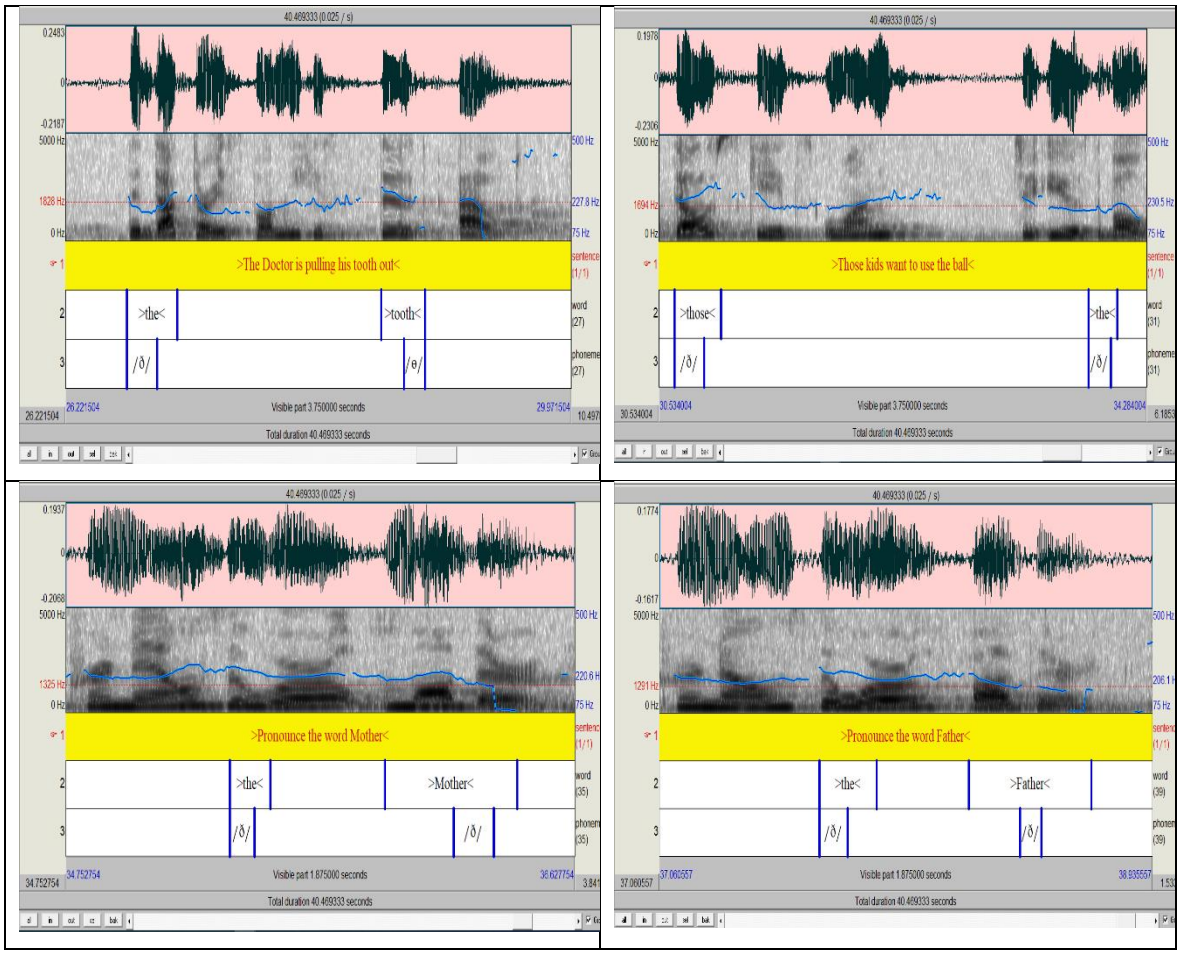






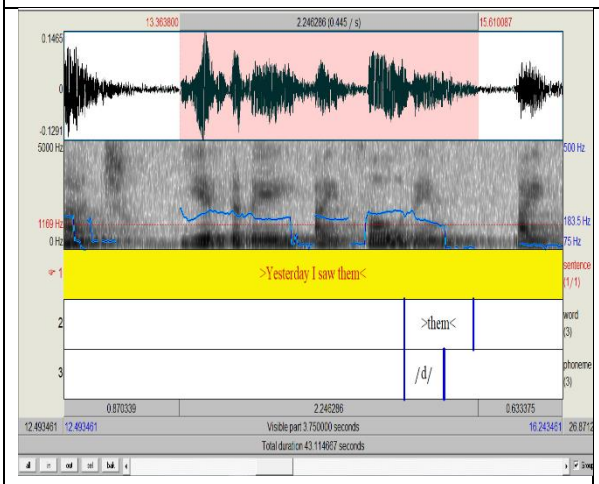


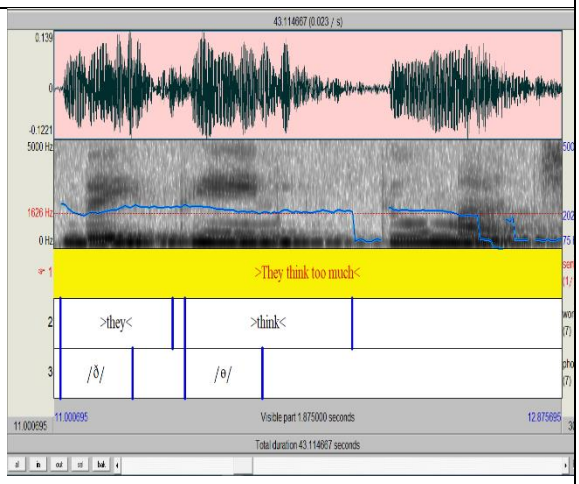


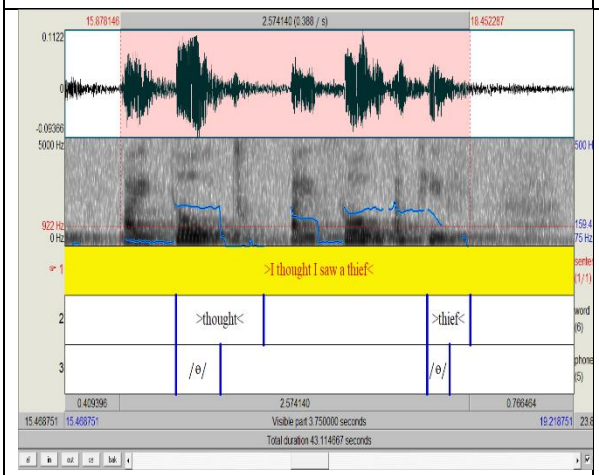


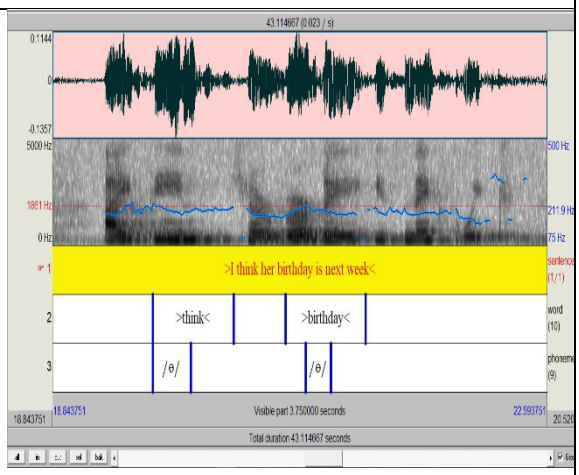
Source: Navas, W. (2022)

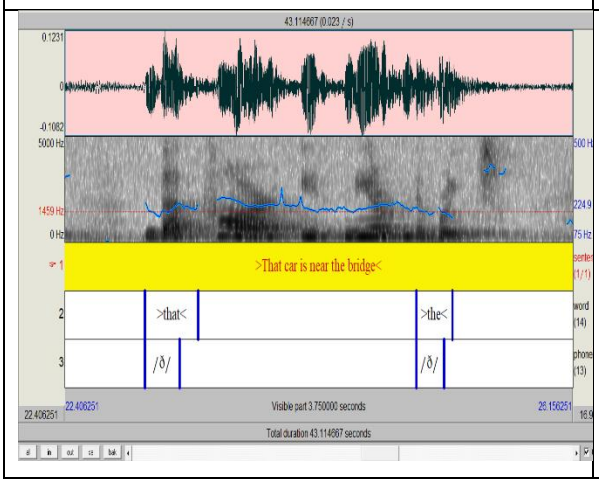
Participant 3, Monolingual L1 English

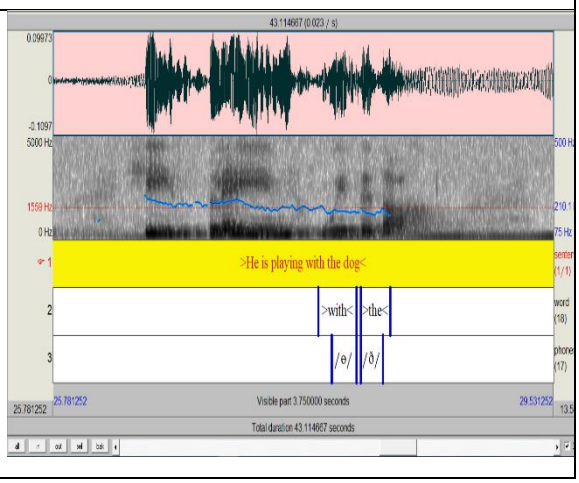


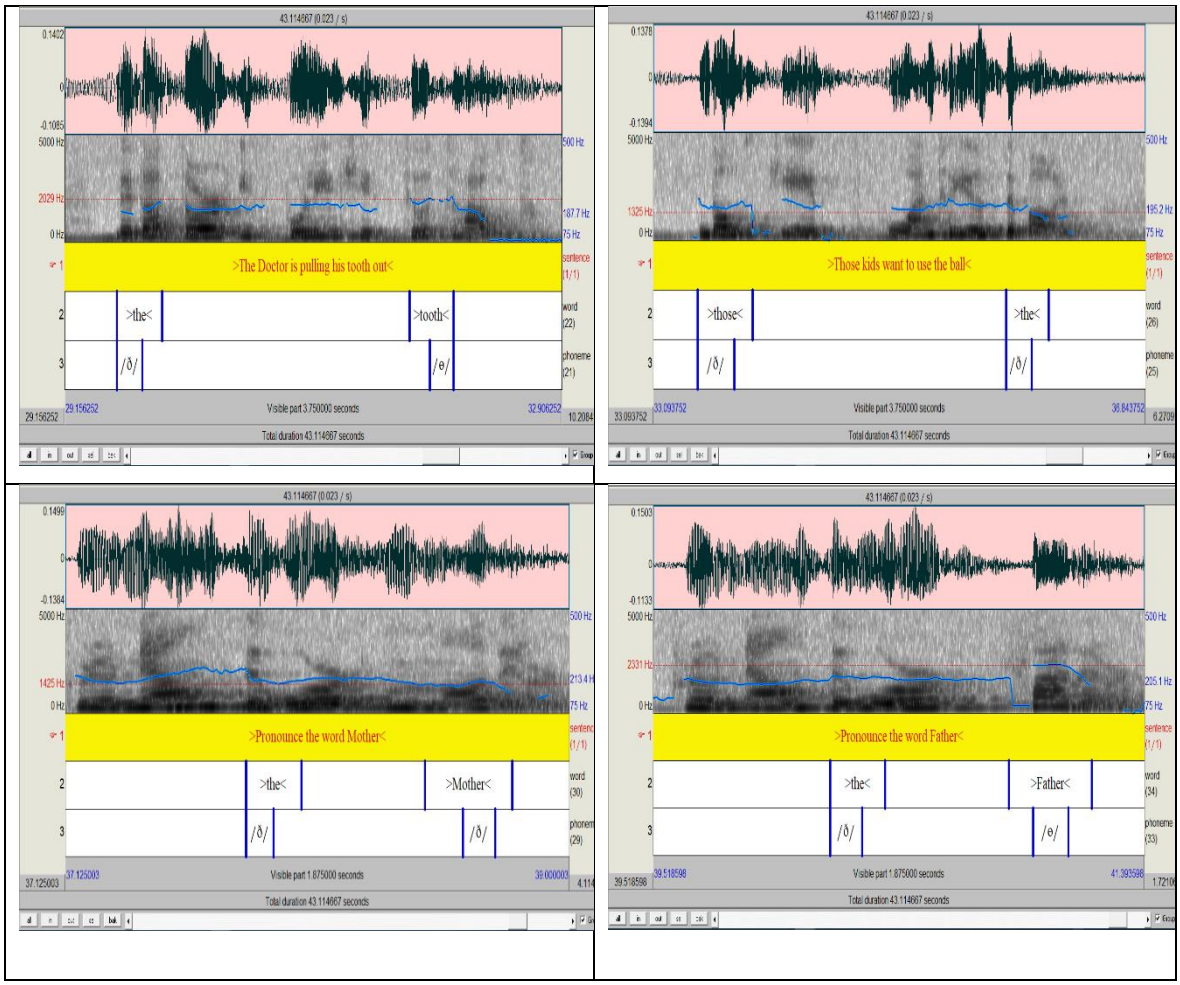








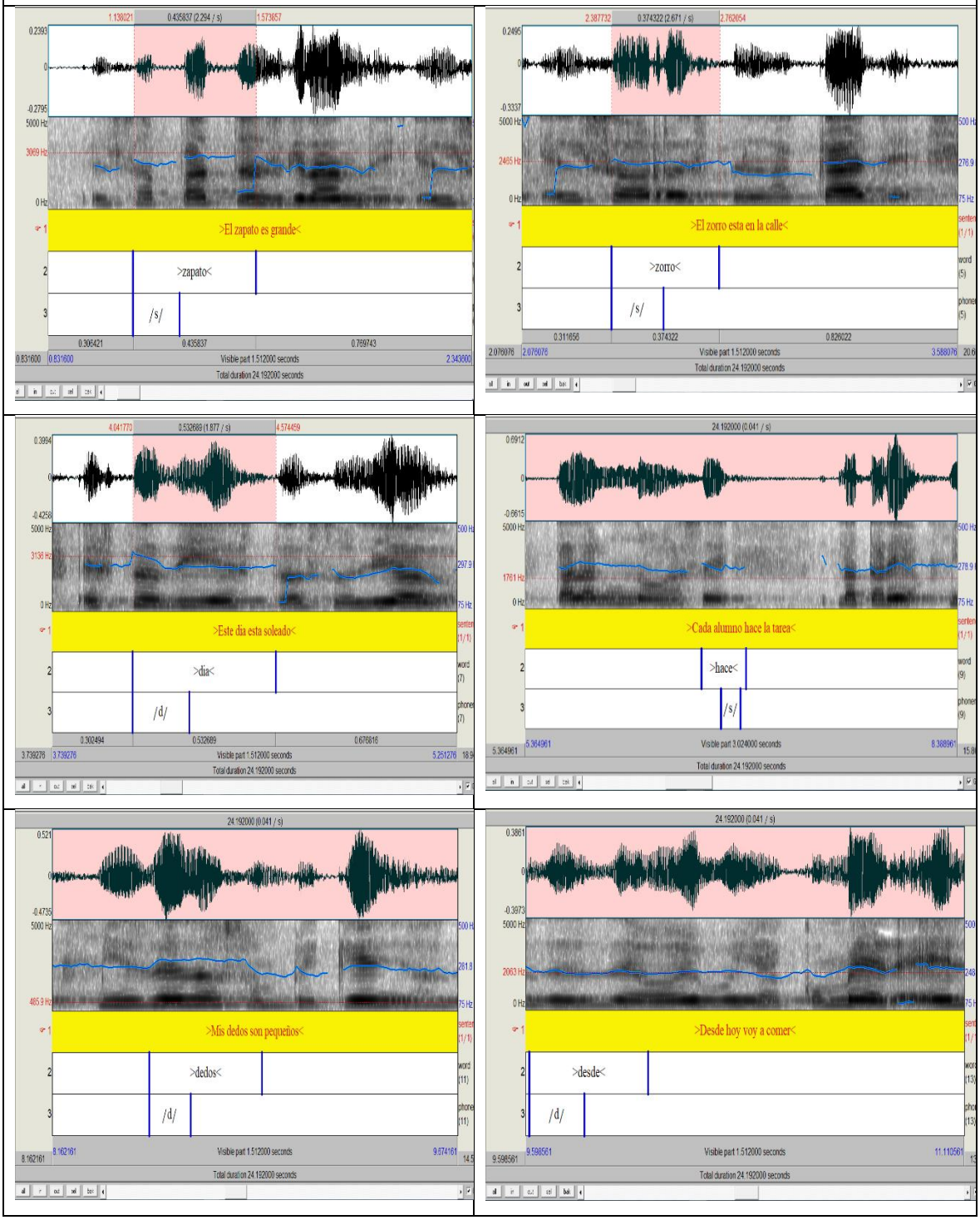


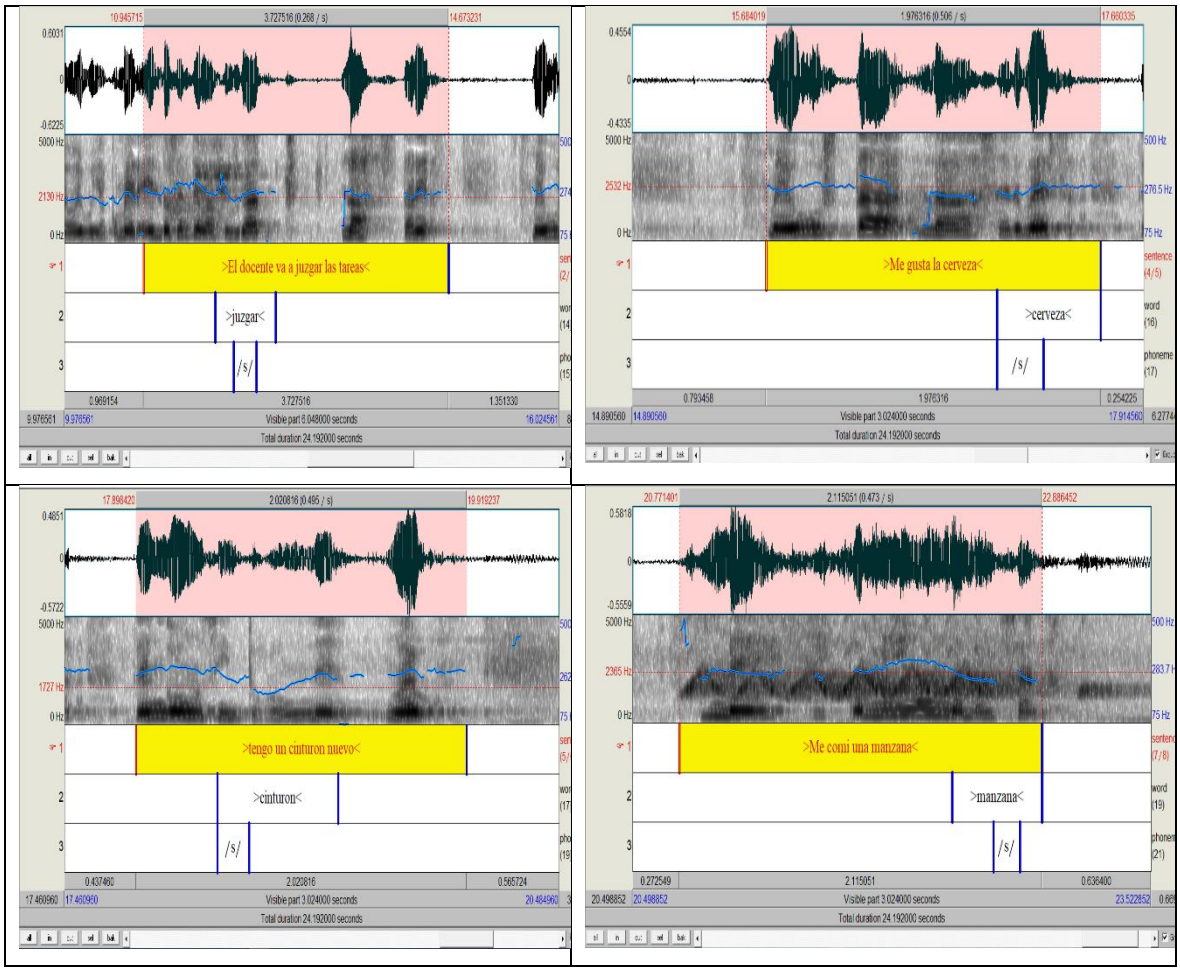


Source: Navas, W. (2022)

Annex 4. Spectrograms of the control group (monolinguals L1 Spanish)

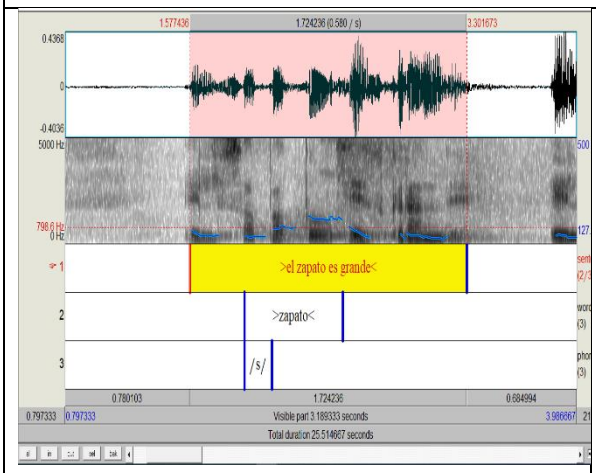
Participant 1, Monolingual L1 Spanish

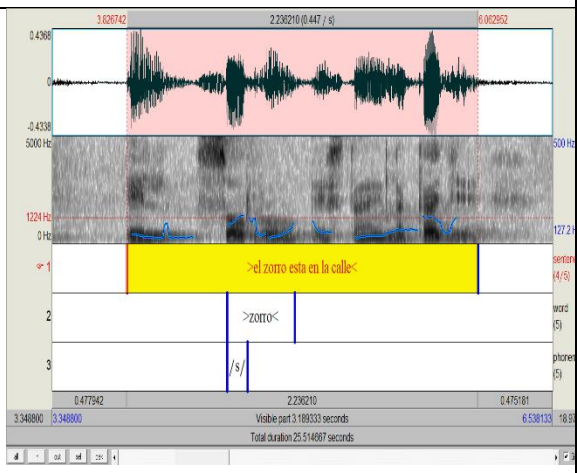


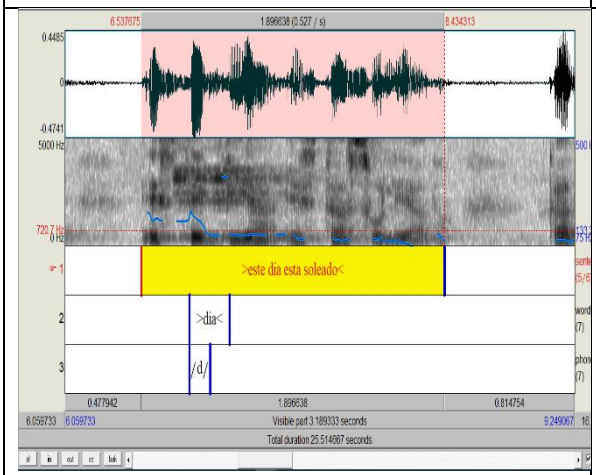


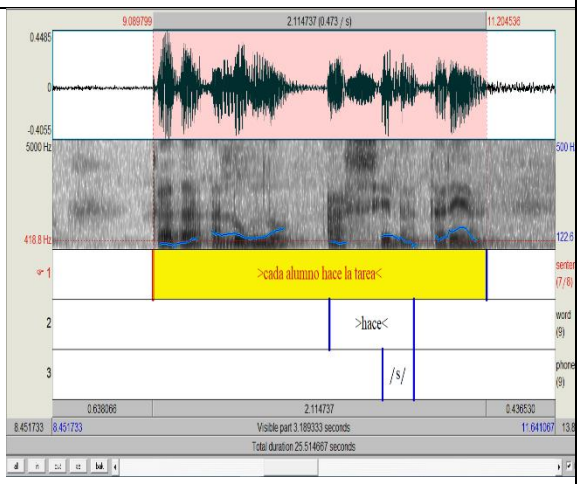
Source: Navas, W. (2022)

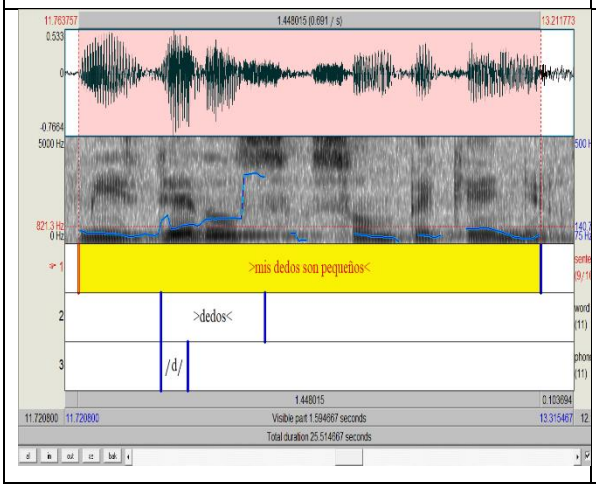
Participant 2, Monolingual L1 Spanish

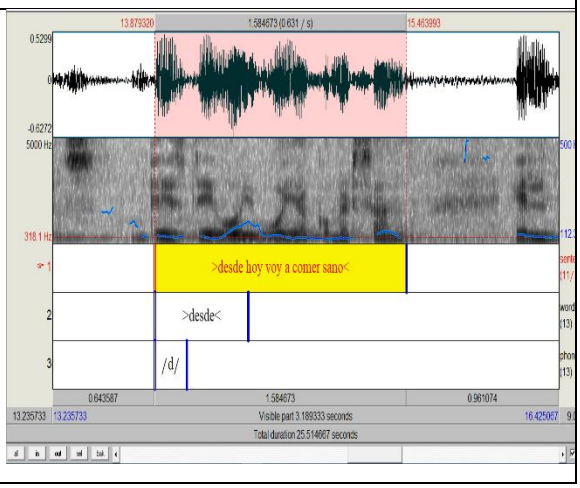


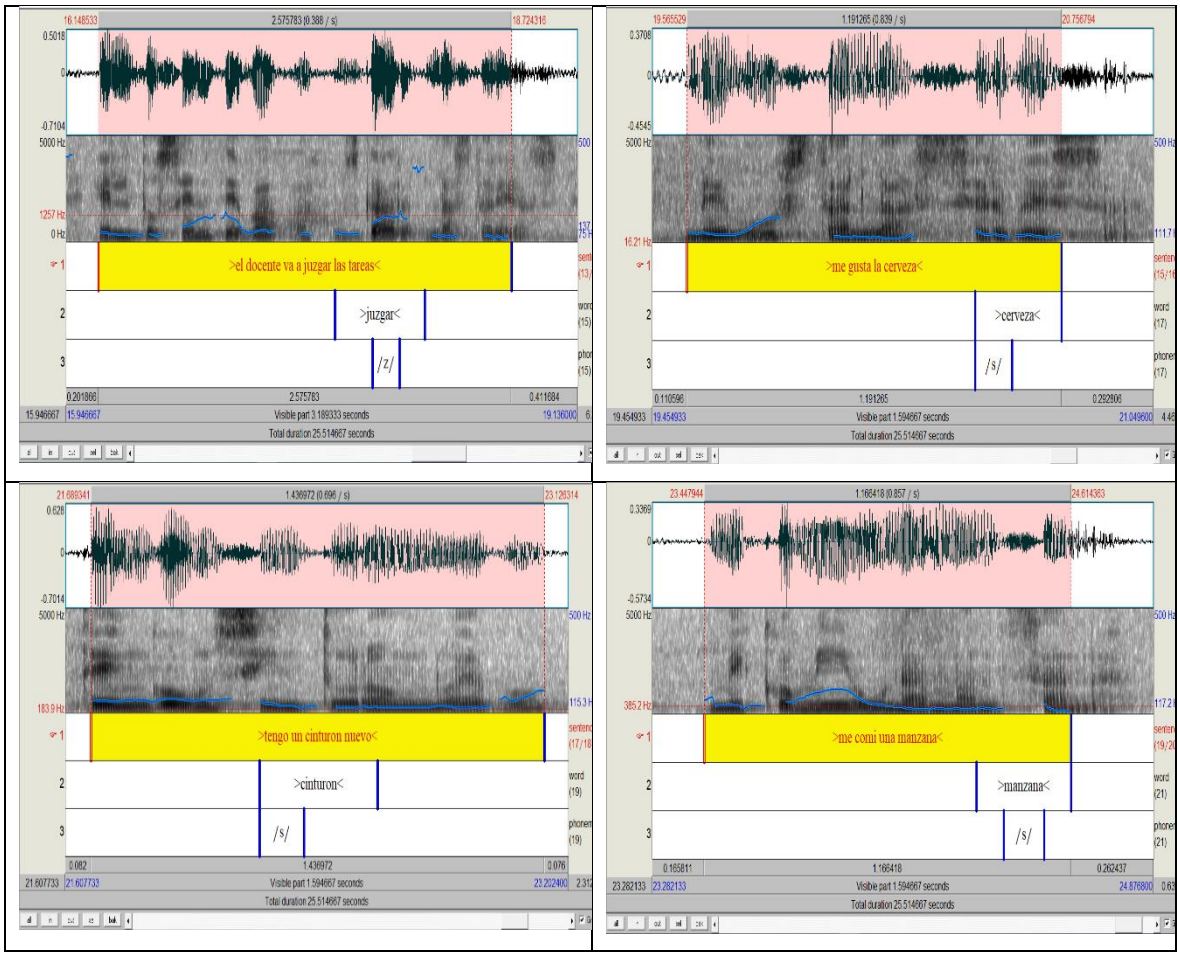






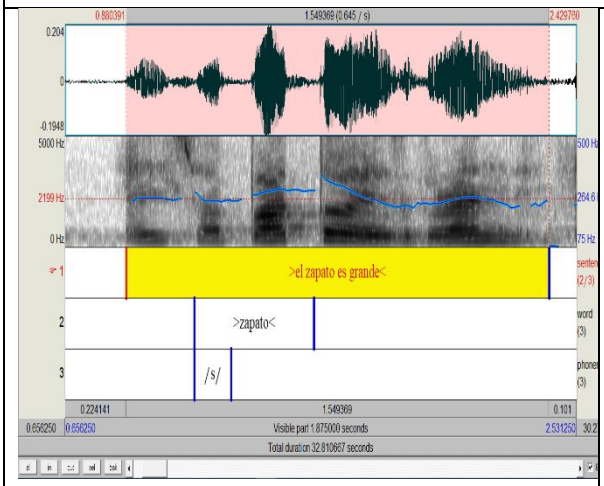


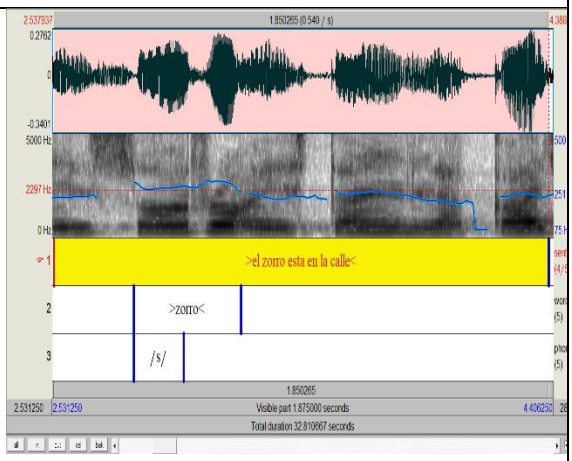


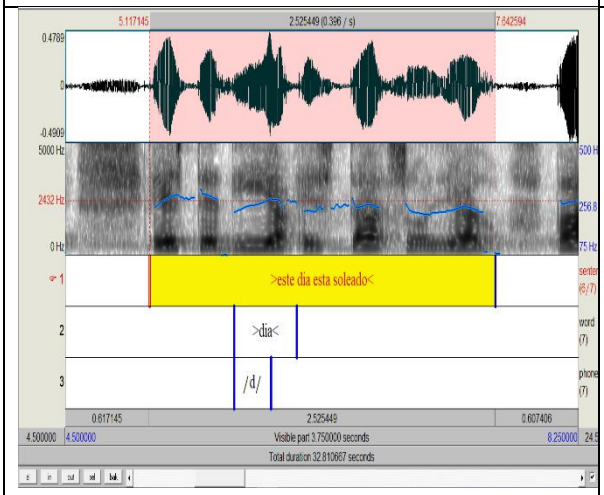


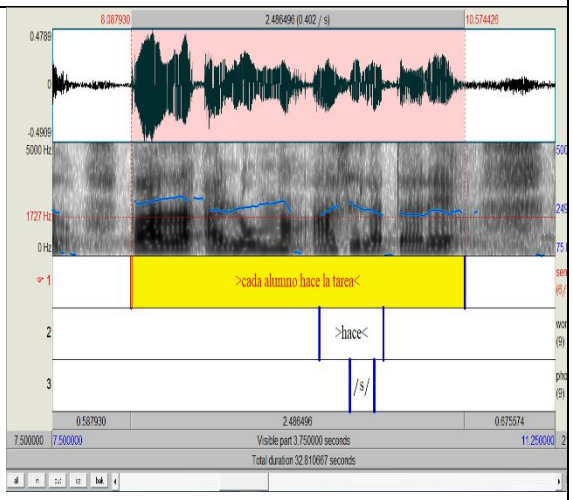
Source: Navas, W. (2022)

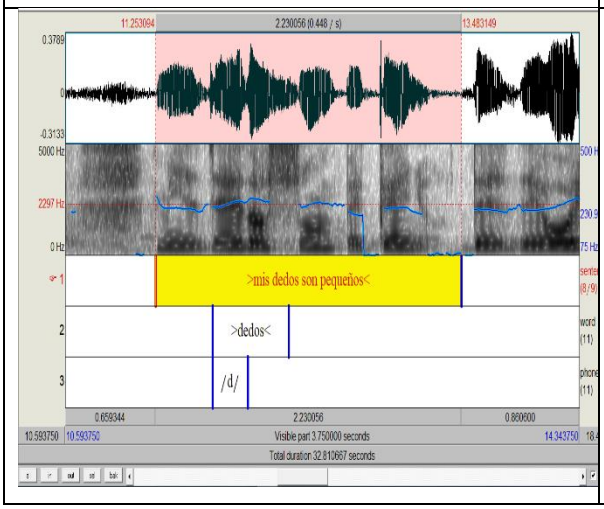
Participant 3, Monolingual L1 Spanish

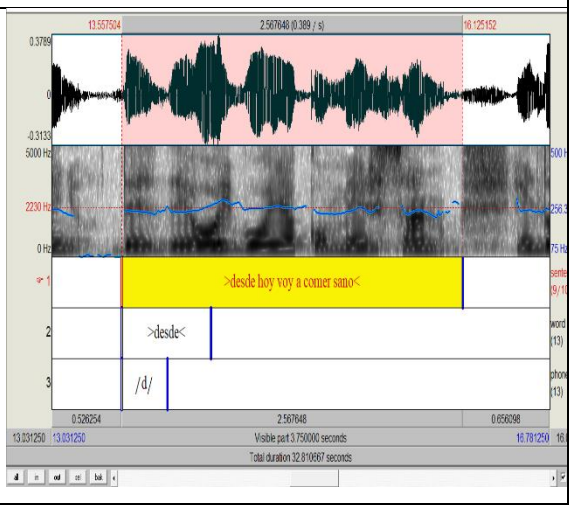


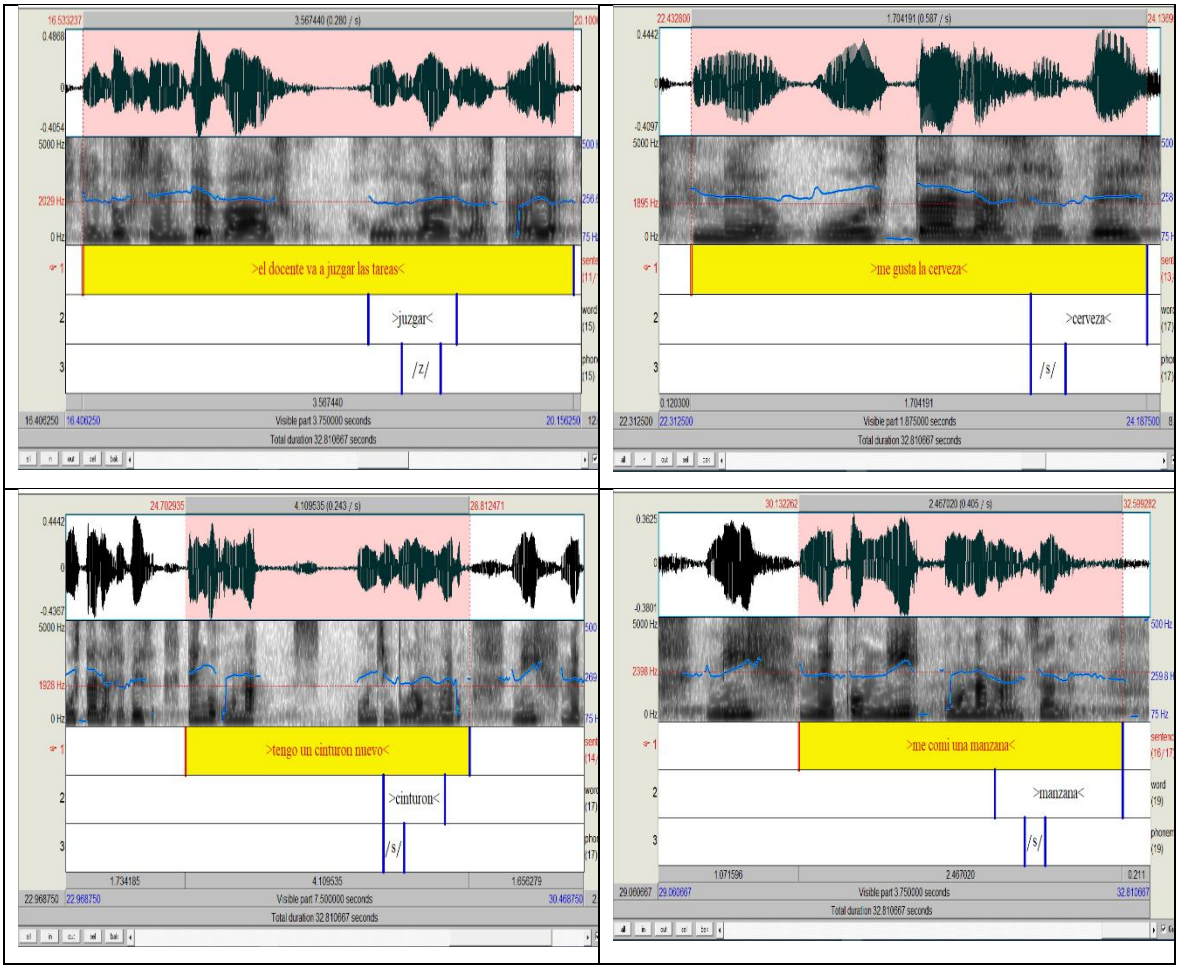








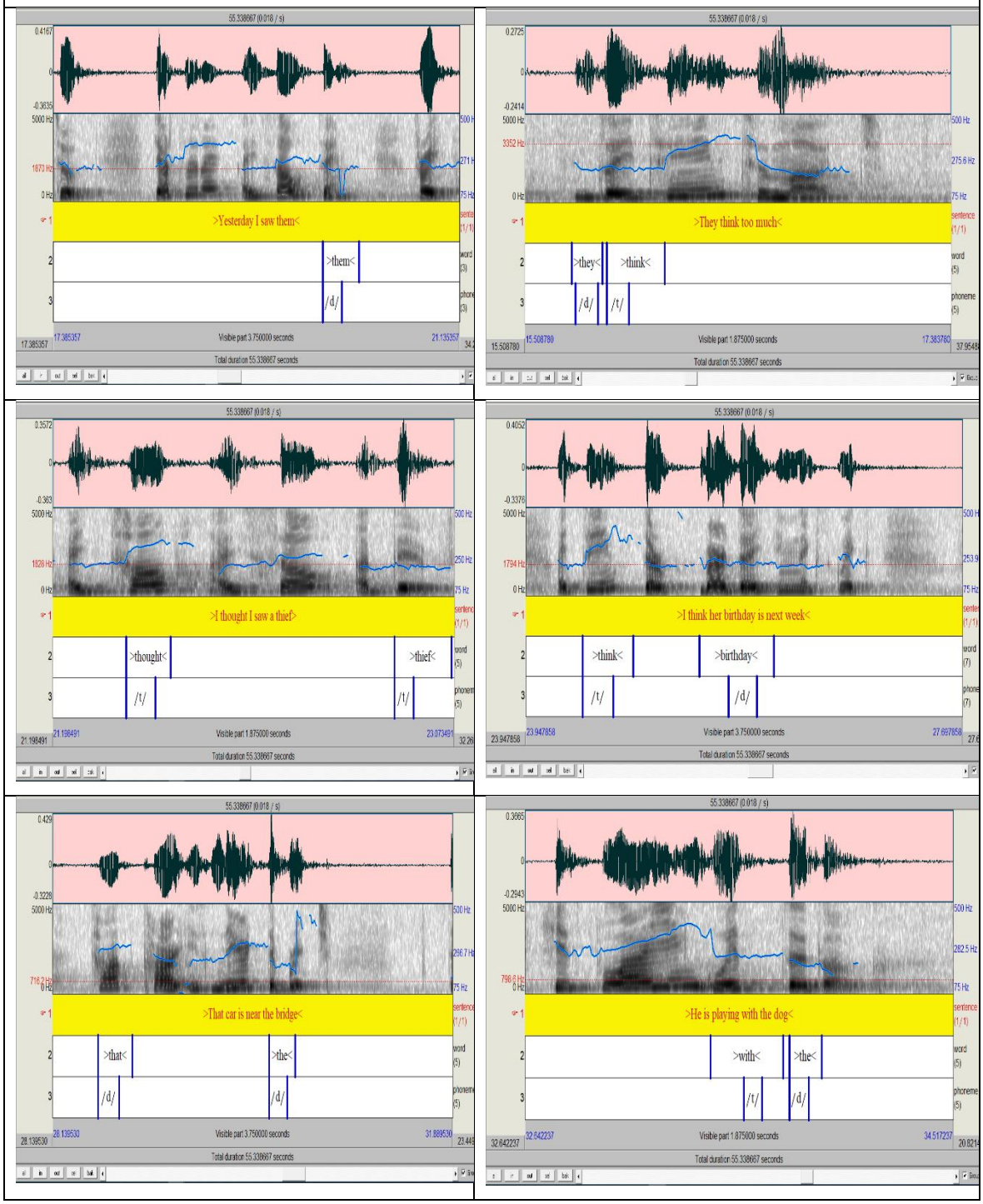


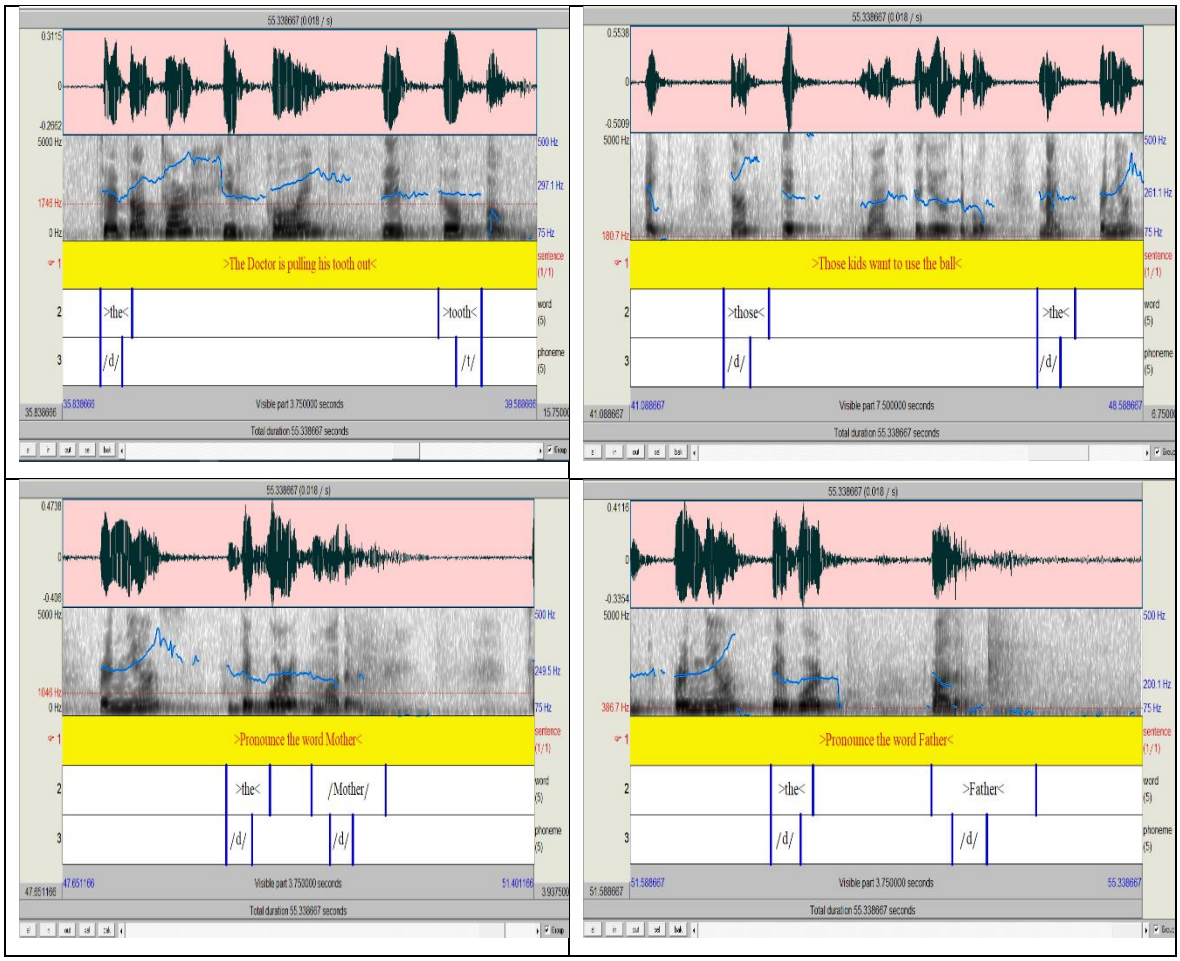


Source: Navas, W. (2022)

Annex 5. Spectrograms of the task group (bilinguals L1 Spanish-L2 English)

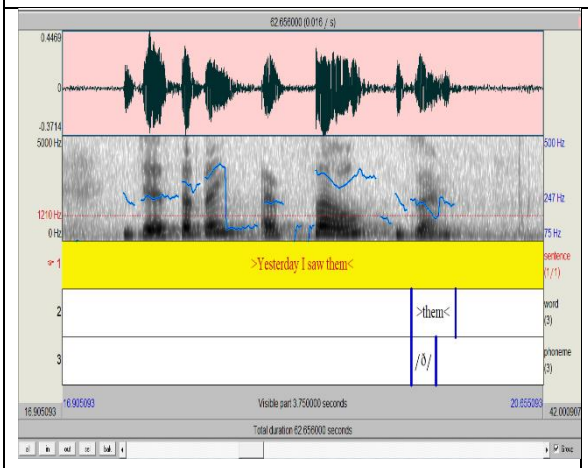
Participant 1, bilingual L1 Spanish-L2 English, before implementation of tools

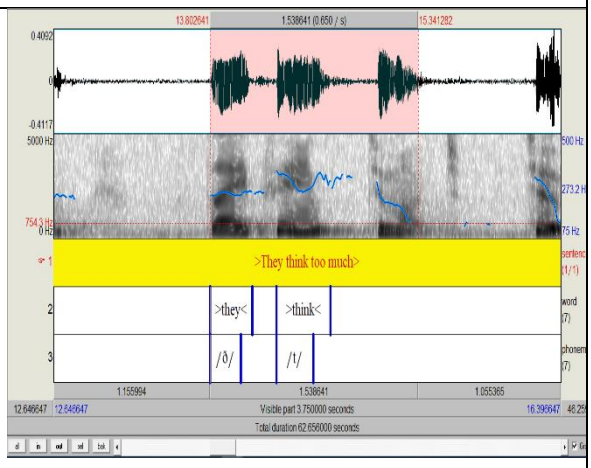


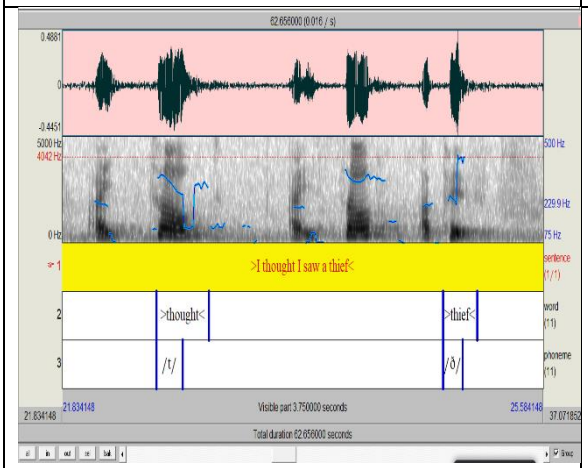


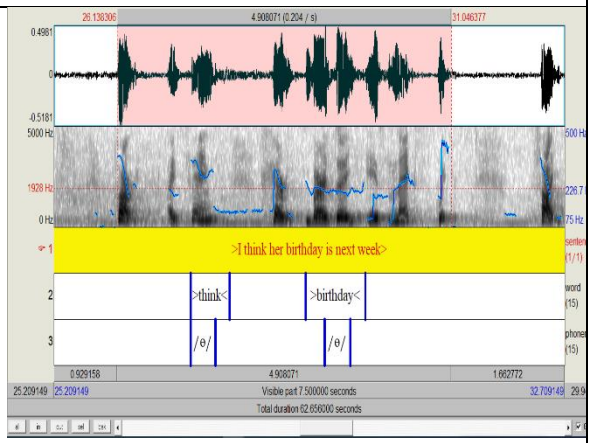
Source: Navas, W. (2022)

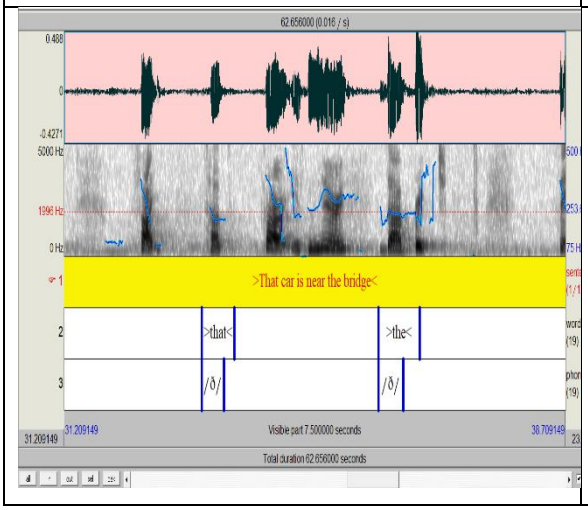
Participant 1, bilingual L1 Spanish-L2 English, after implementation of tools

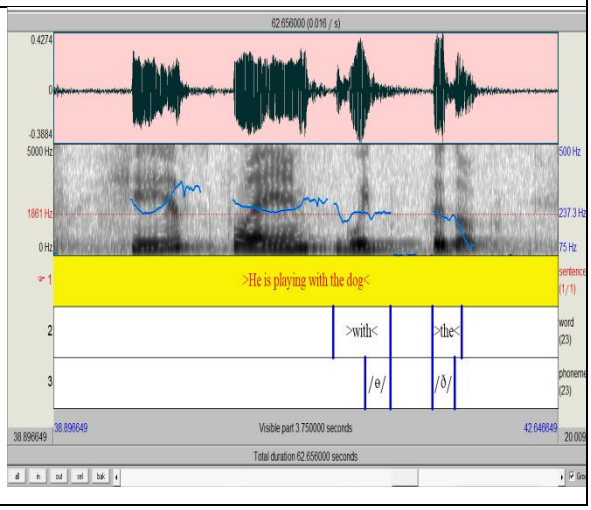


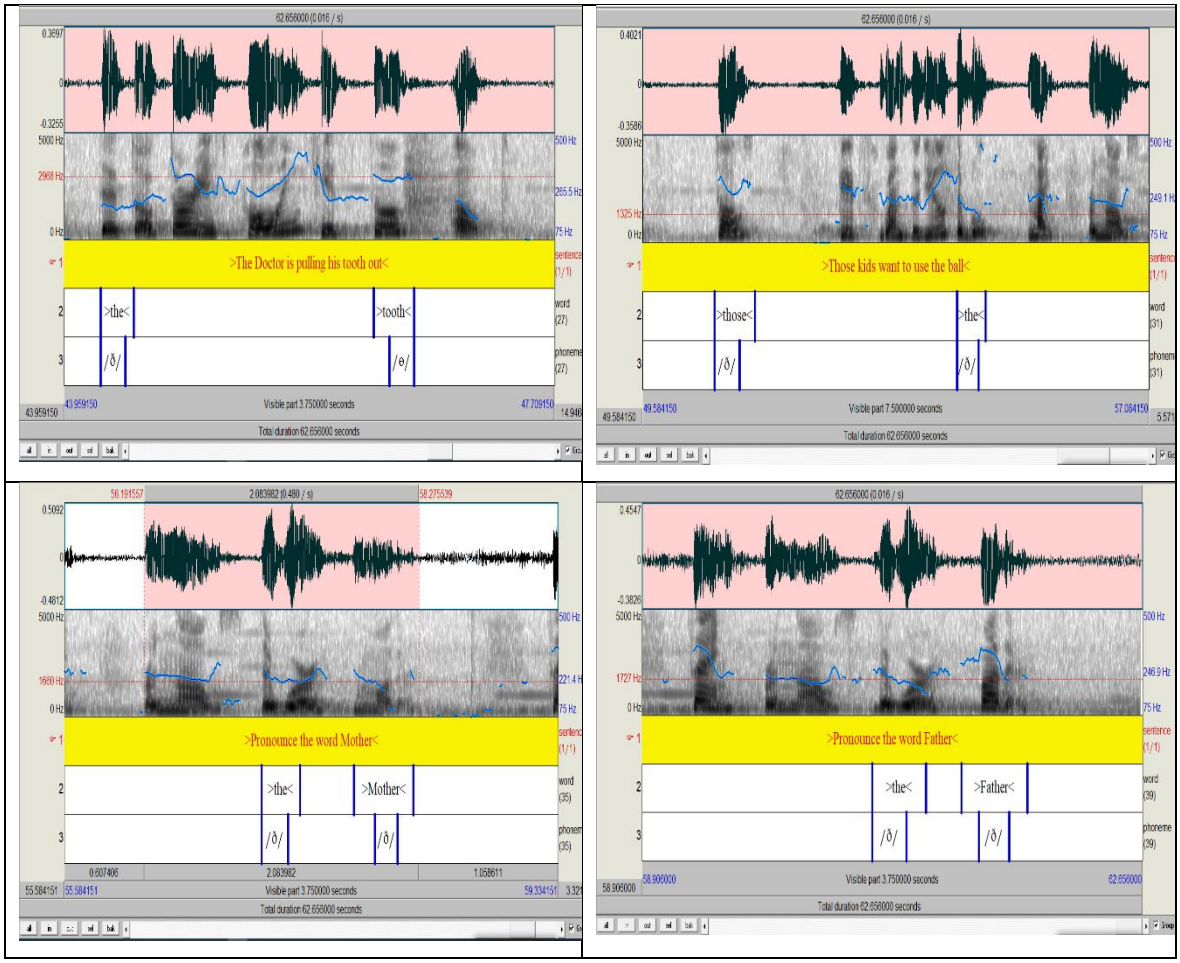






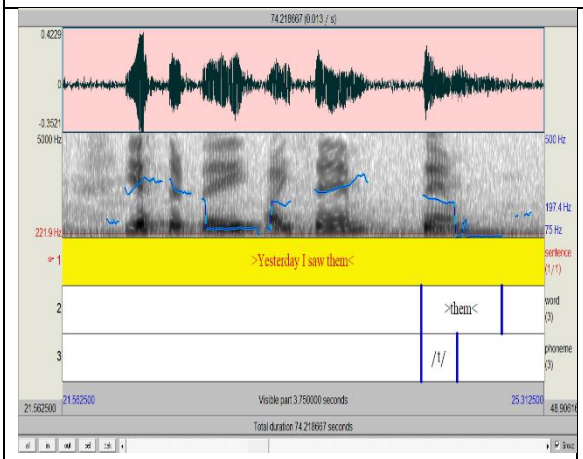


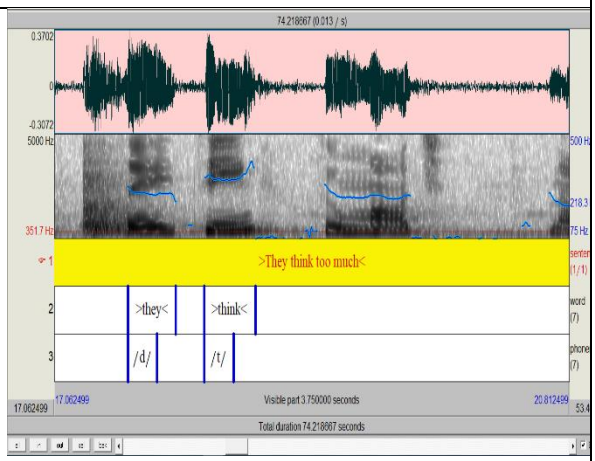


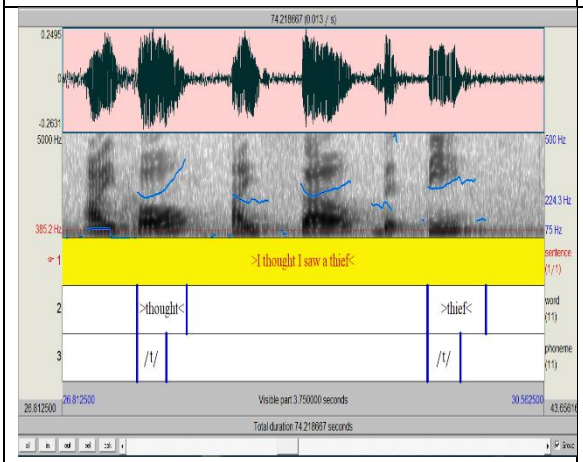


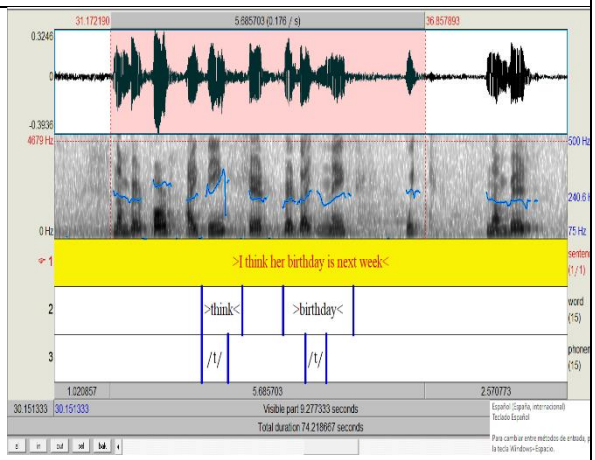
Source: Navas, W. (2022)

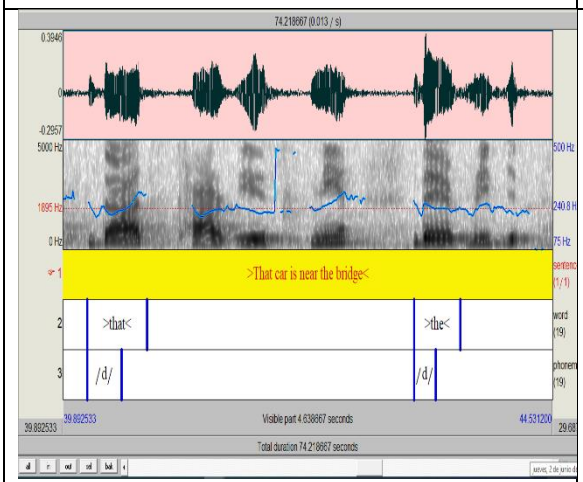
Participant 2, bilingual L1 Spanish-L2 English, before implementation of tools

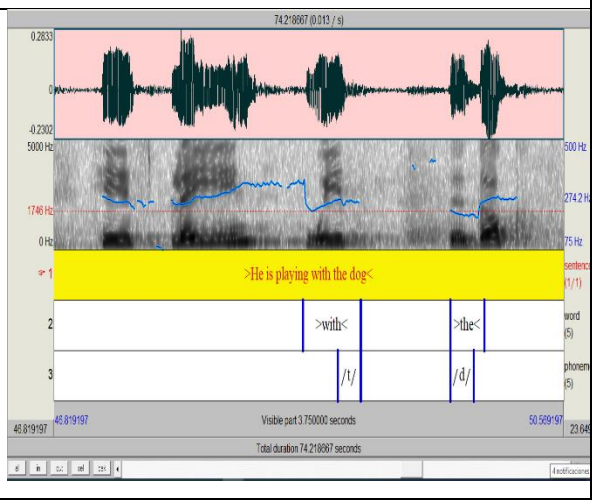


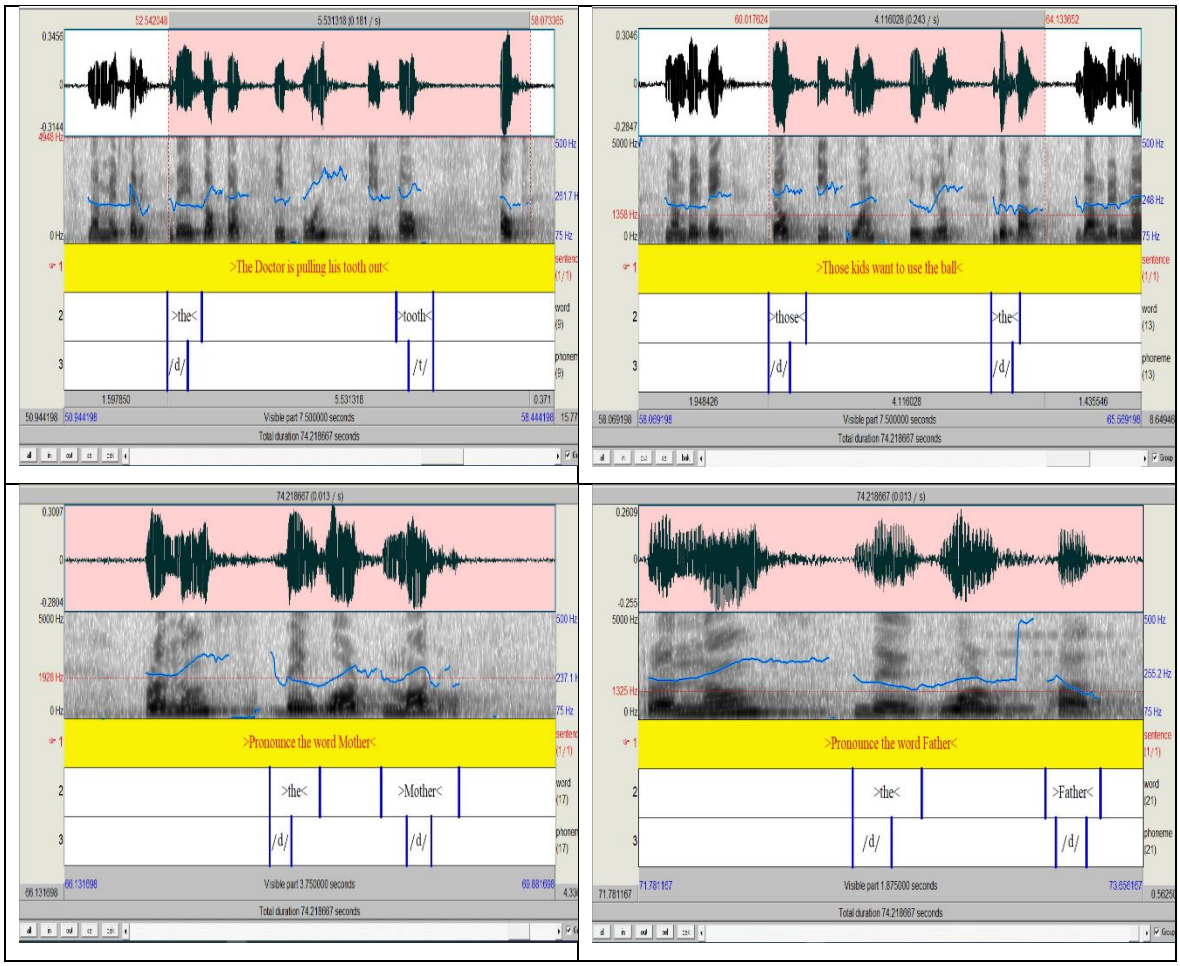






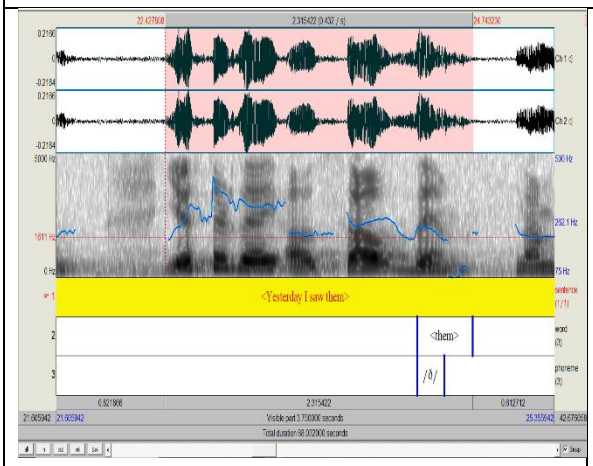


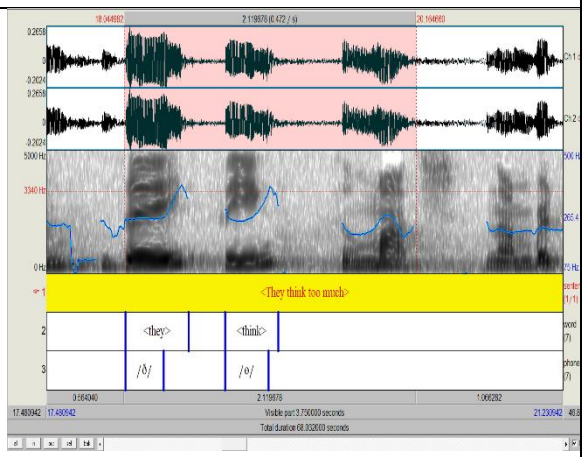


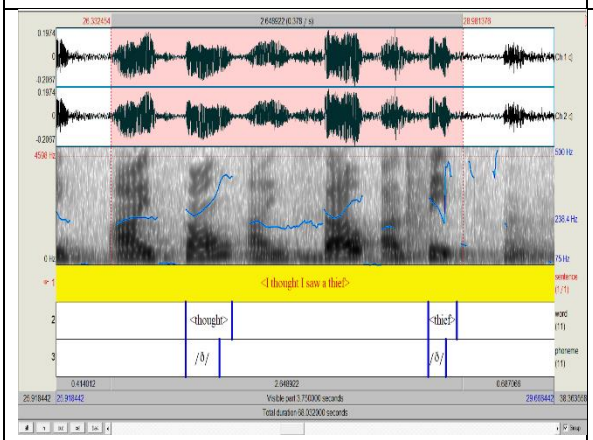


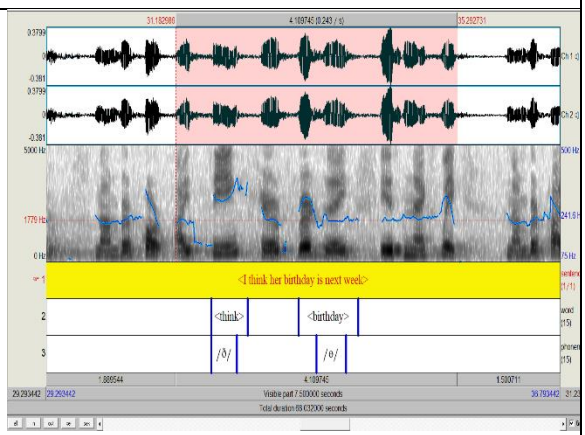
Source: Navas, W. (2022)

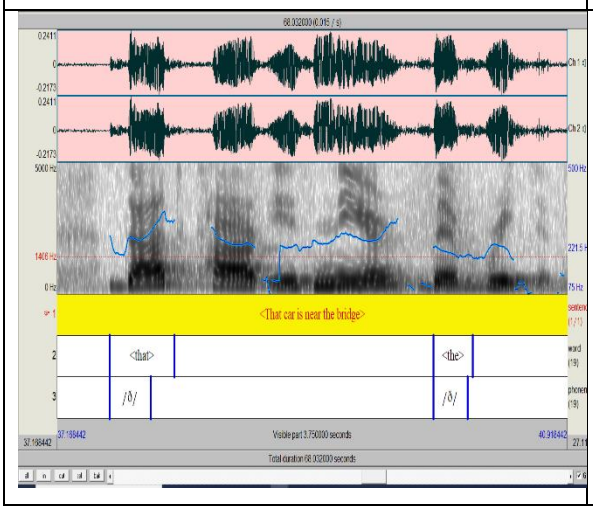
Participant 2, bilingual L1 Spanish-L2 English, after implementation of tools

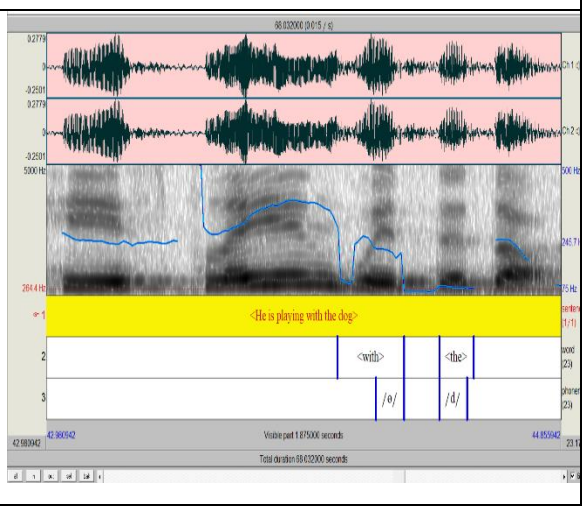


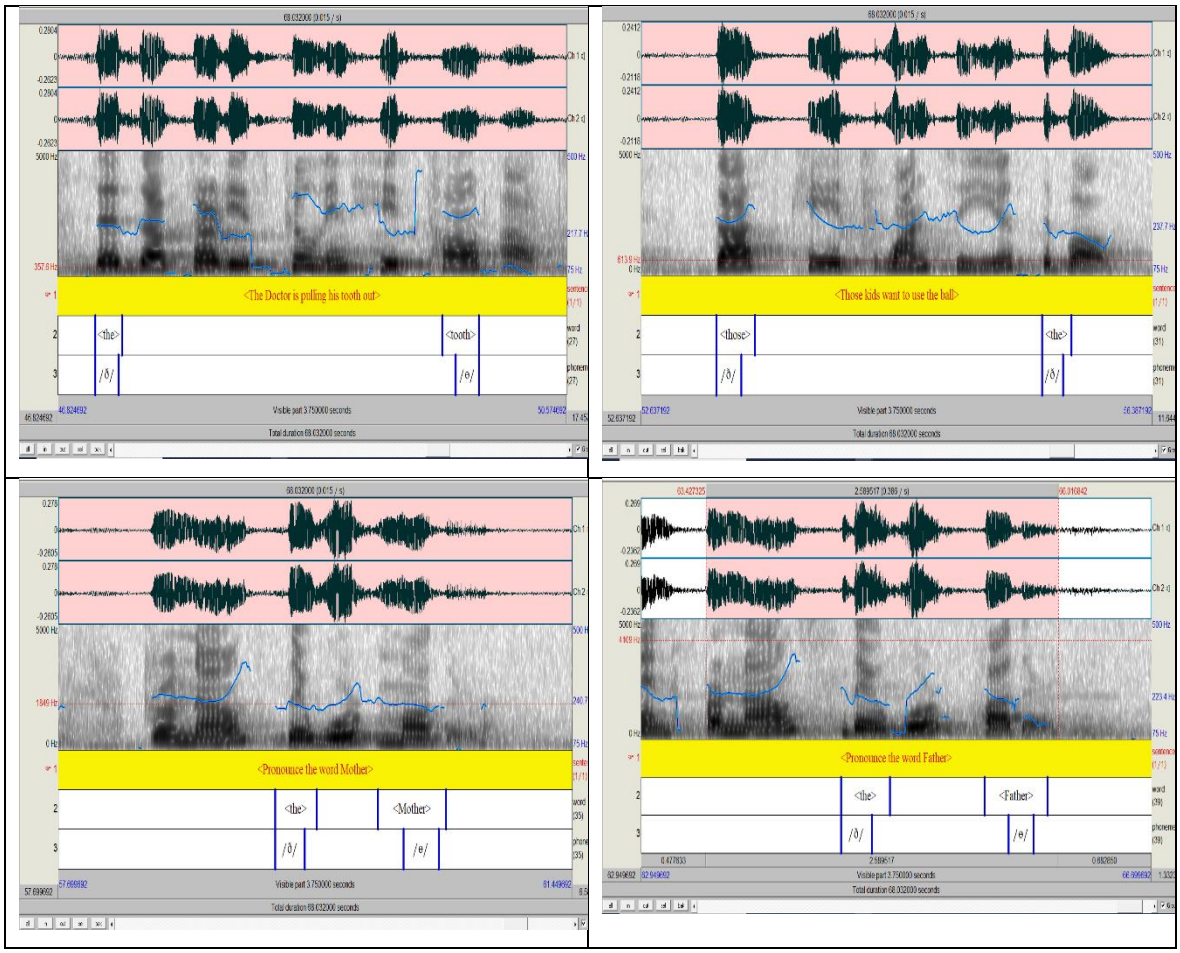






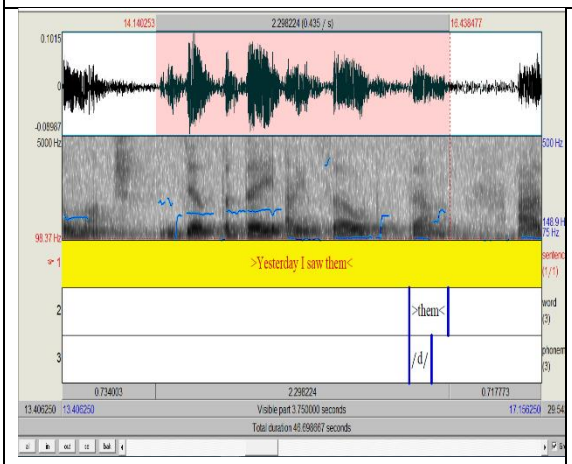


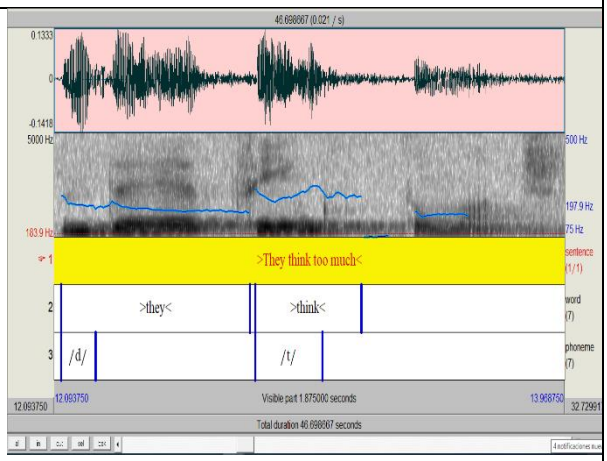


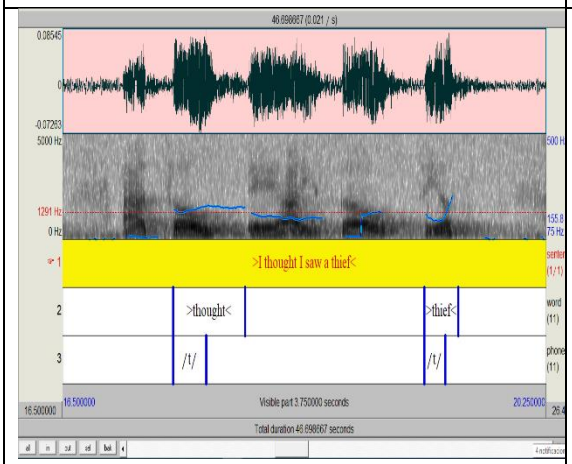


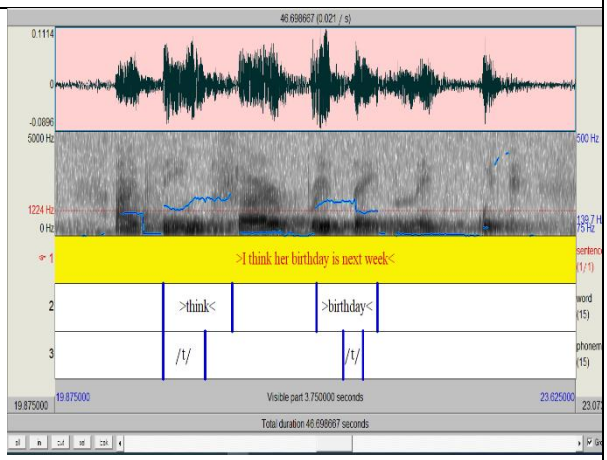
Source: Navas, W. (2022)

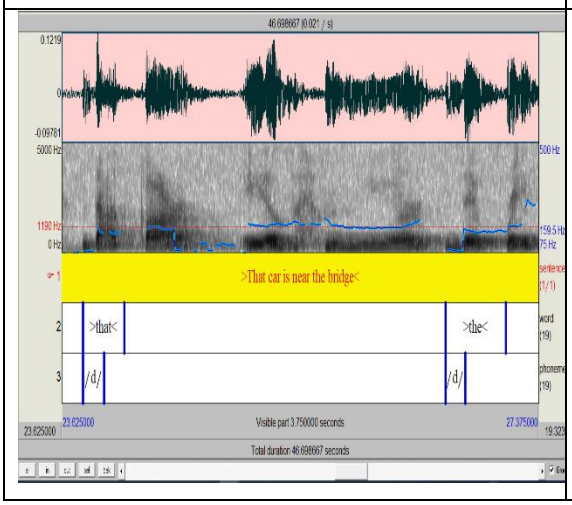
Participant 3, bilingual L1 Spanish-L2 English, before implementation of tools

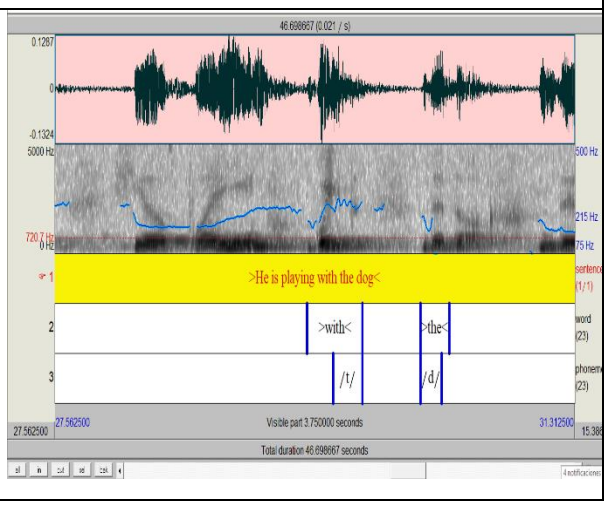


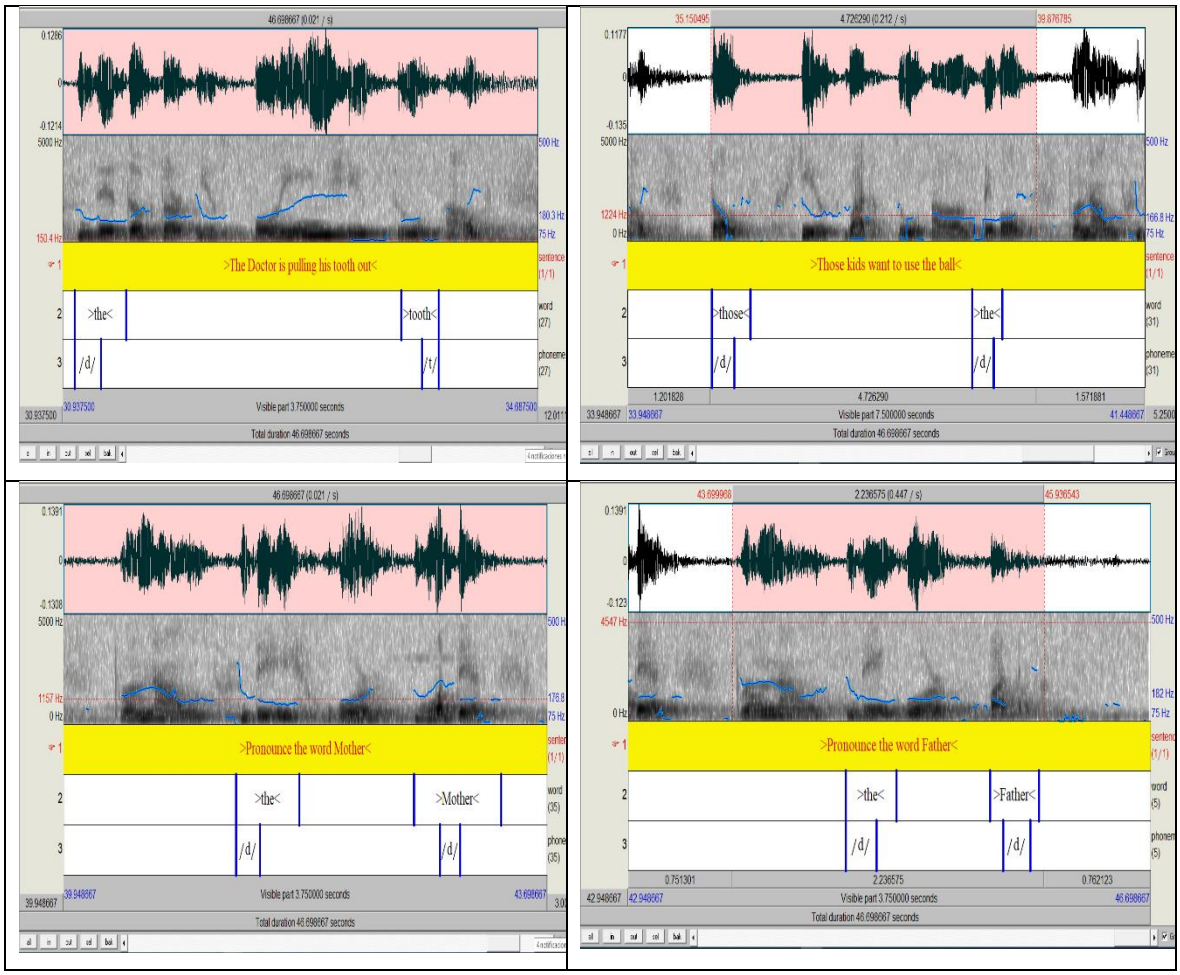






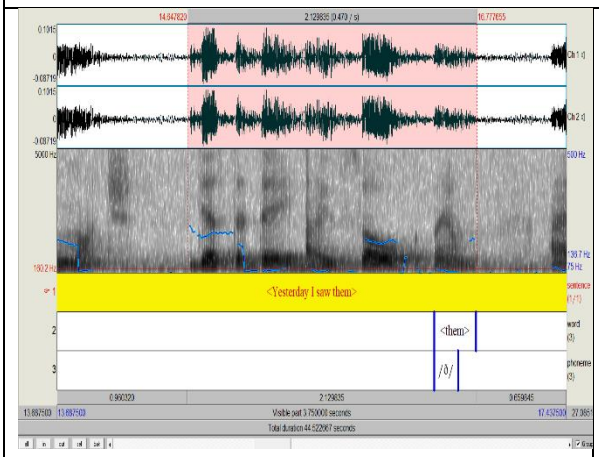


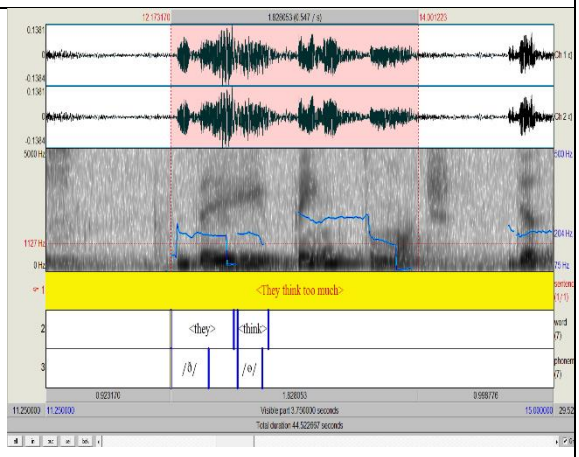


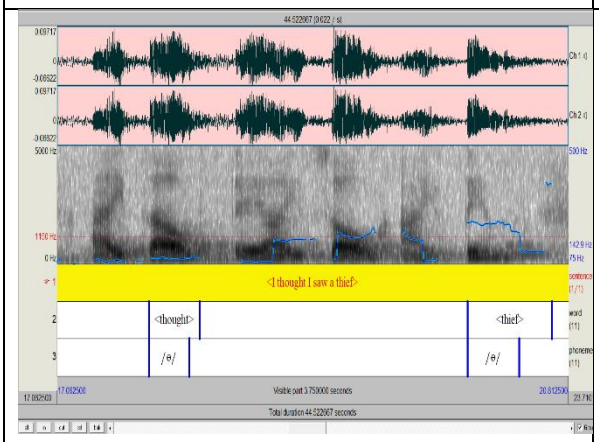


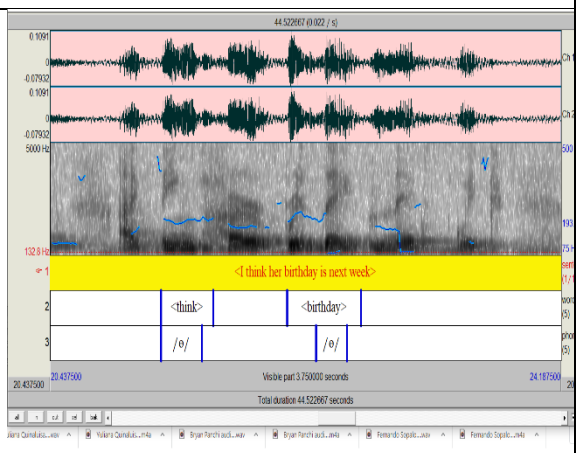
Source: Navas, W. (2022)

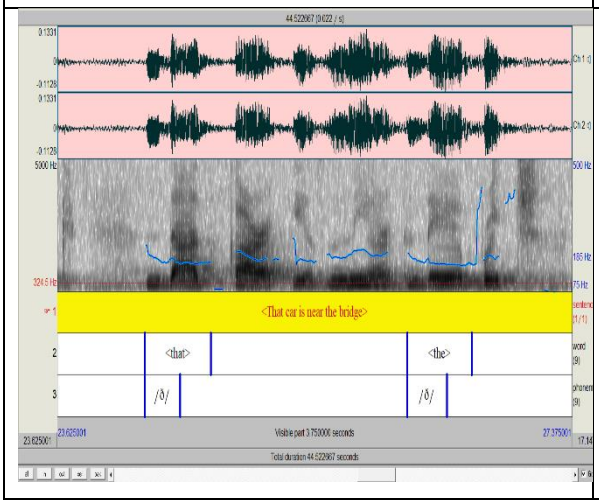
Participant 3, bilingual L1 Spanish-L2 English, after implementation of tools

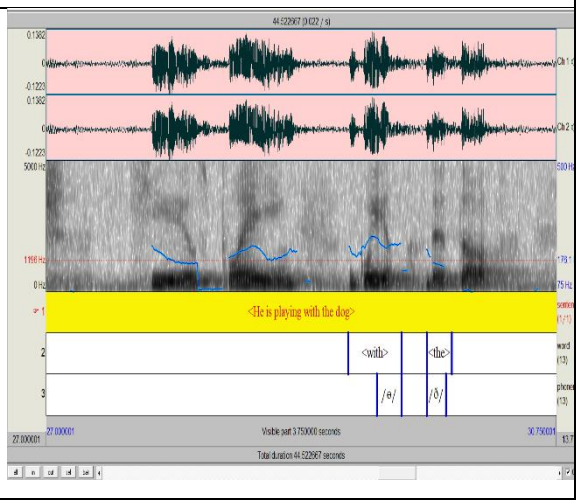


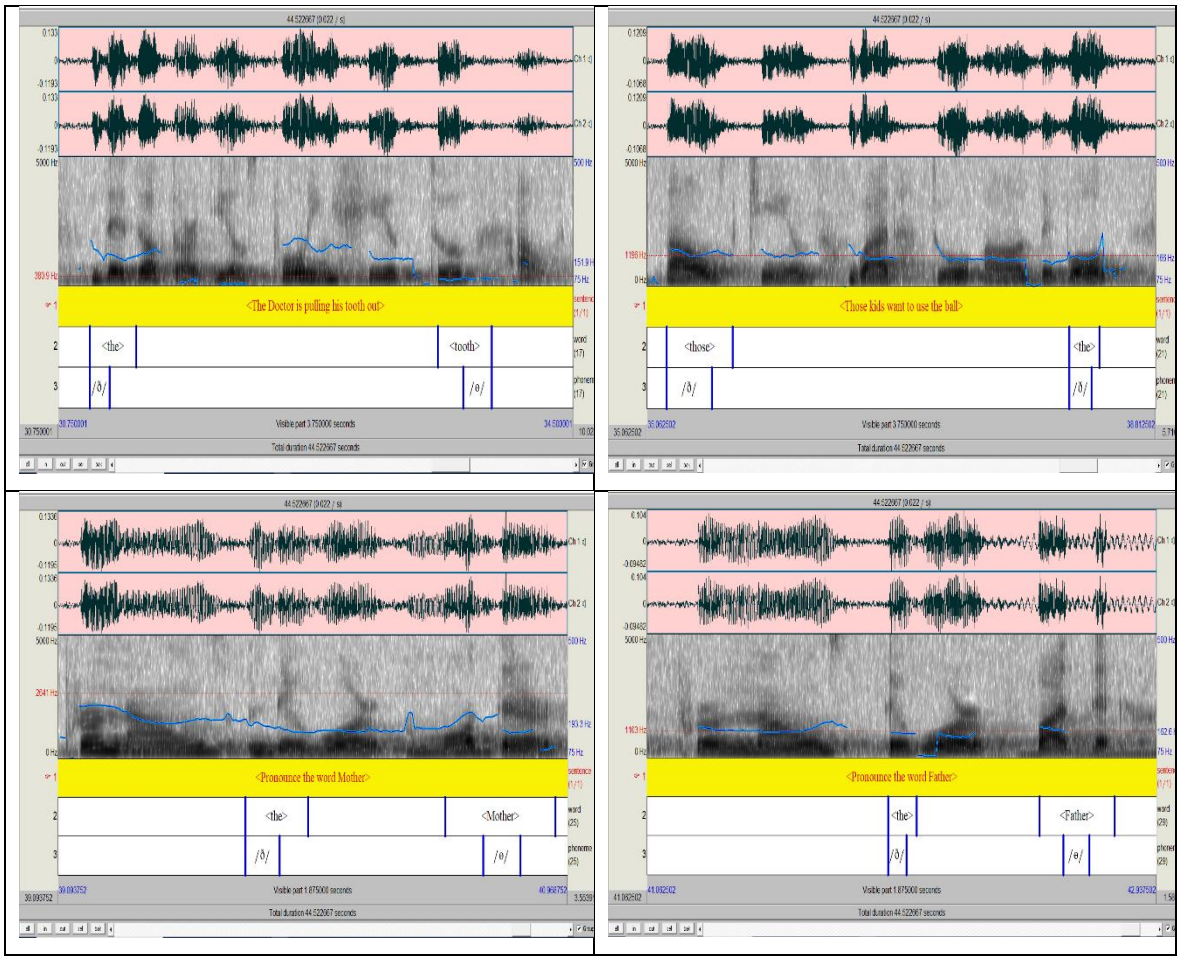






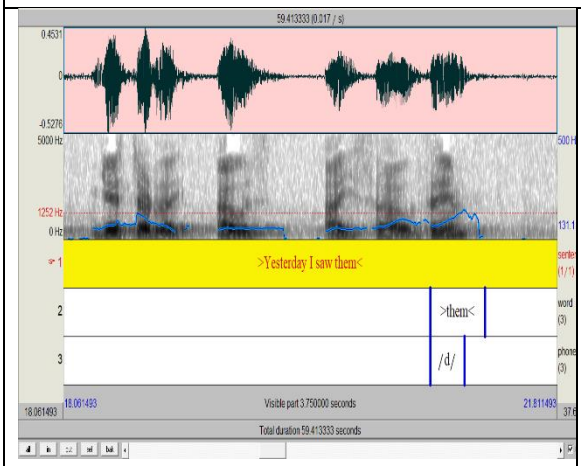


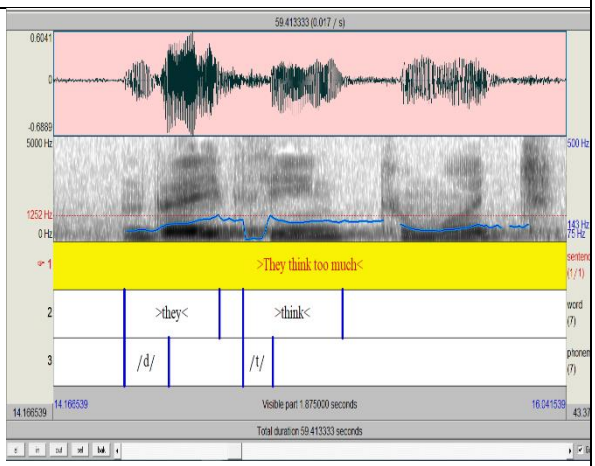


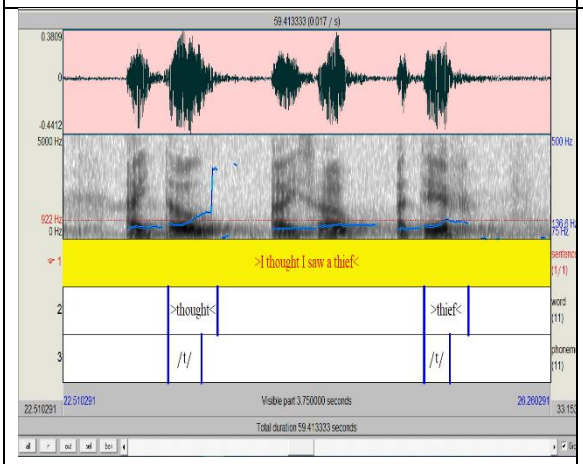


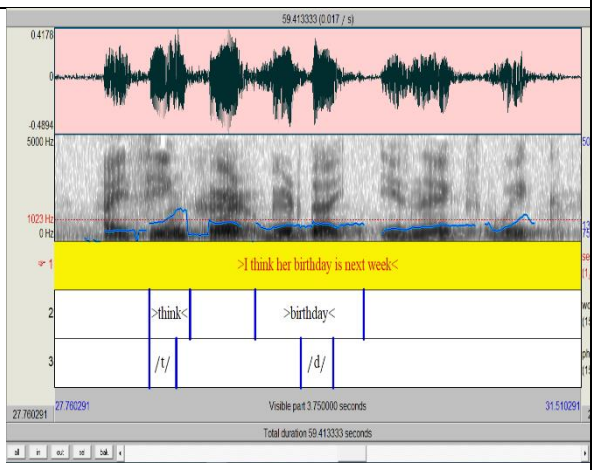
Source: Navas, W. (2022)

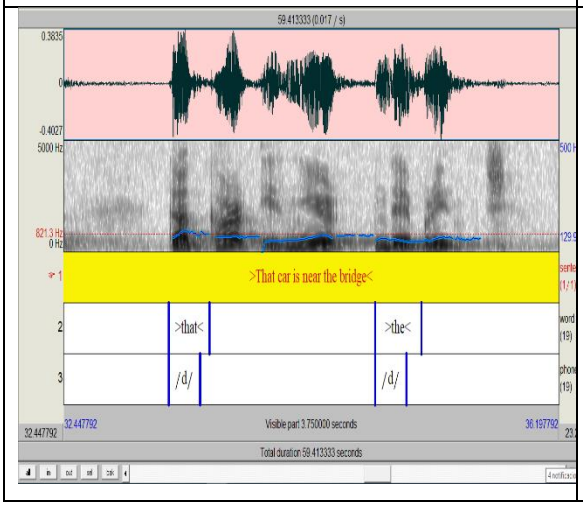
Participant 4, bilingual L1 Spanish-L2 English, before implementation of tools

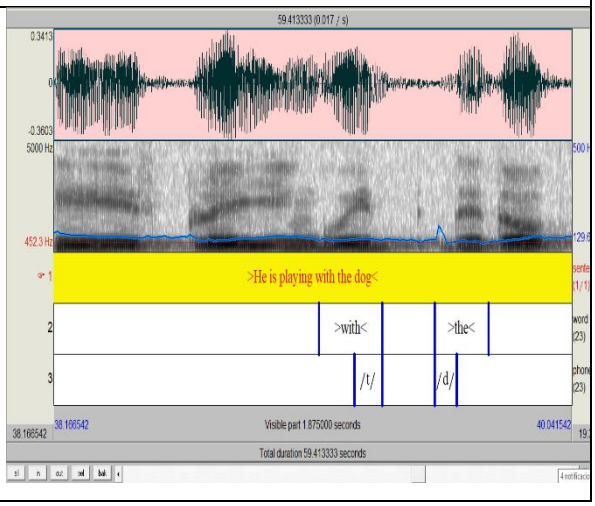


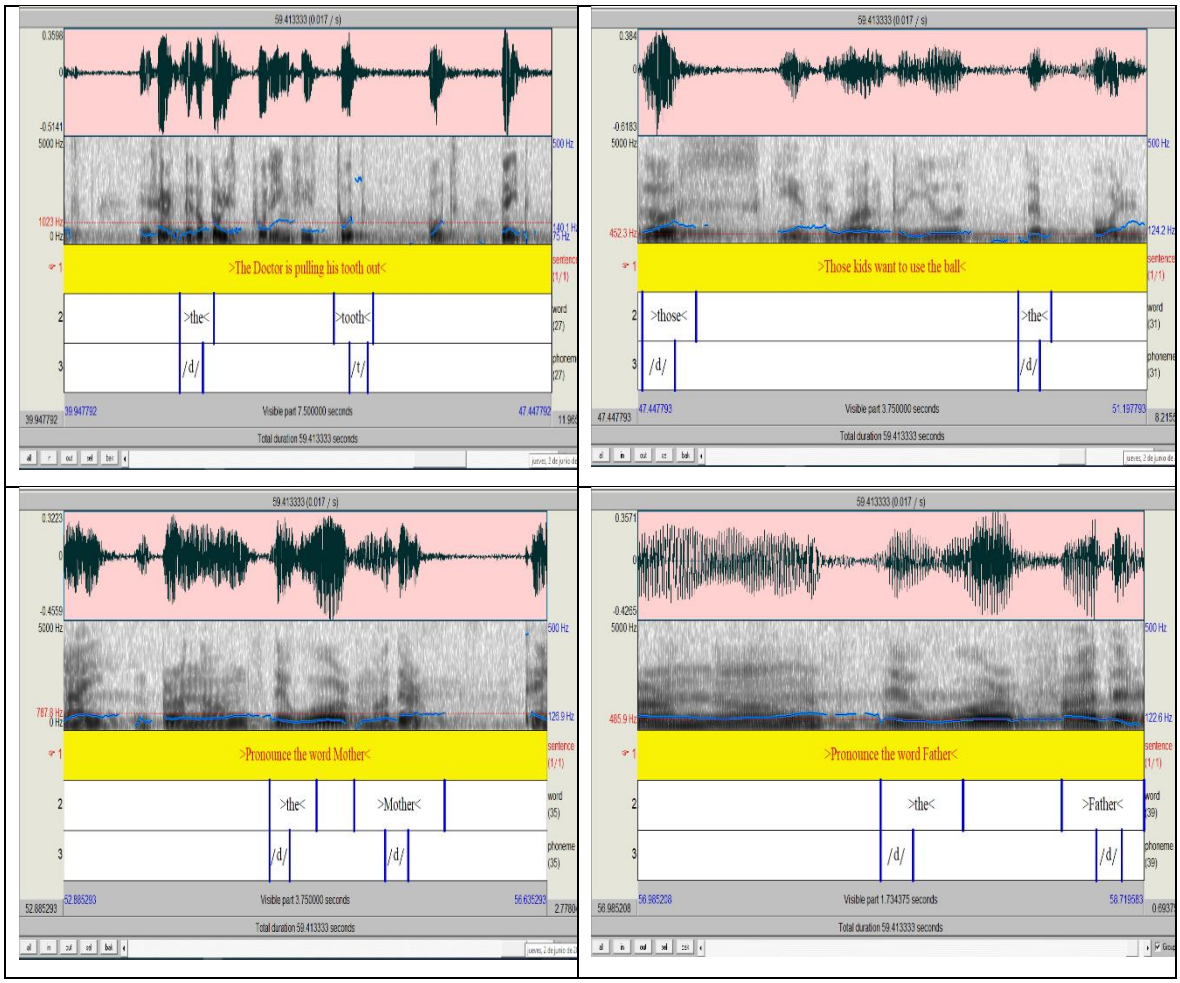






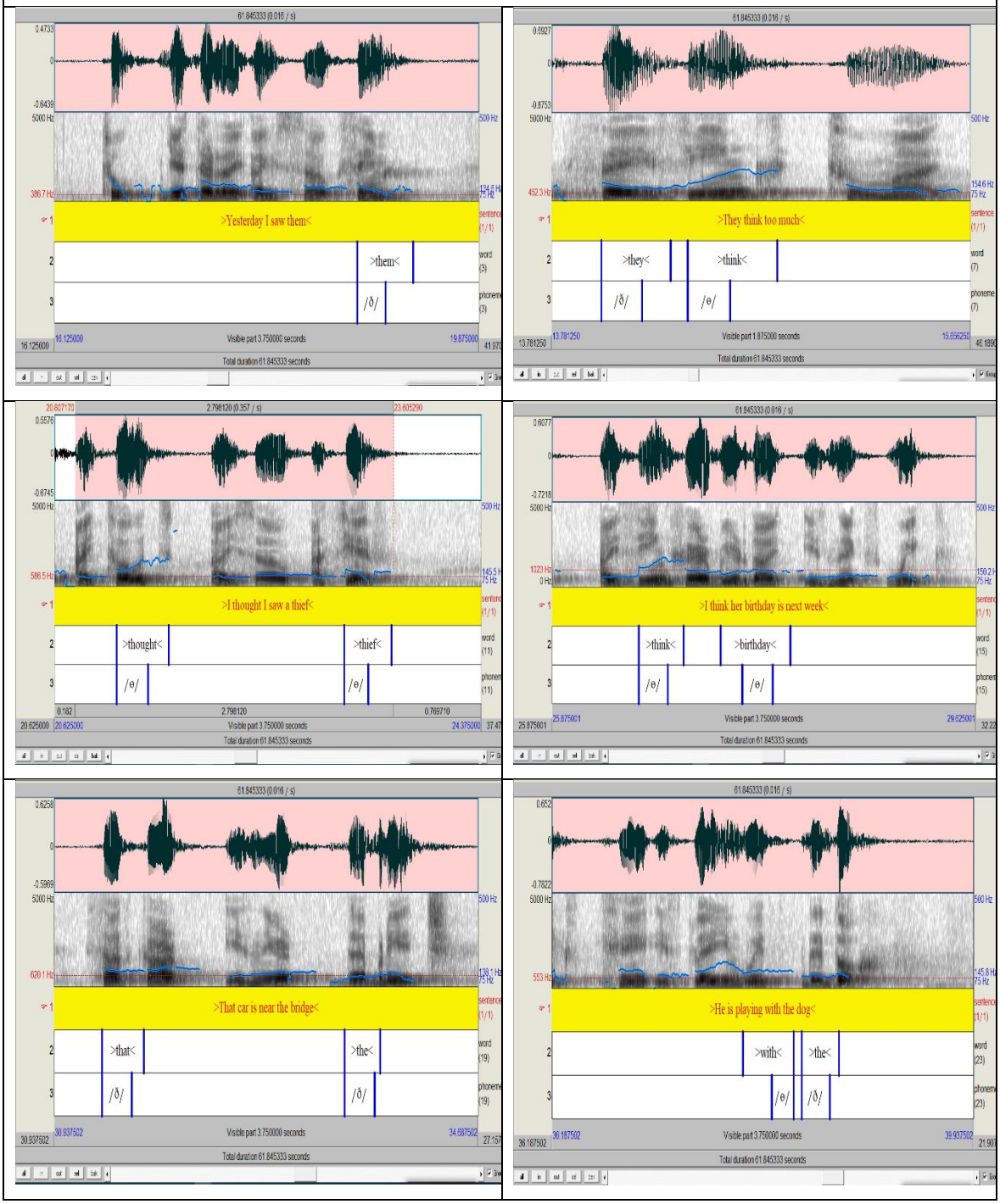


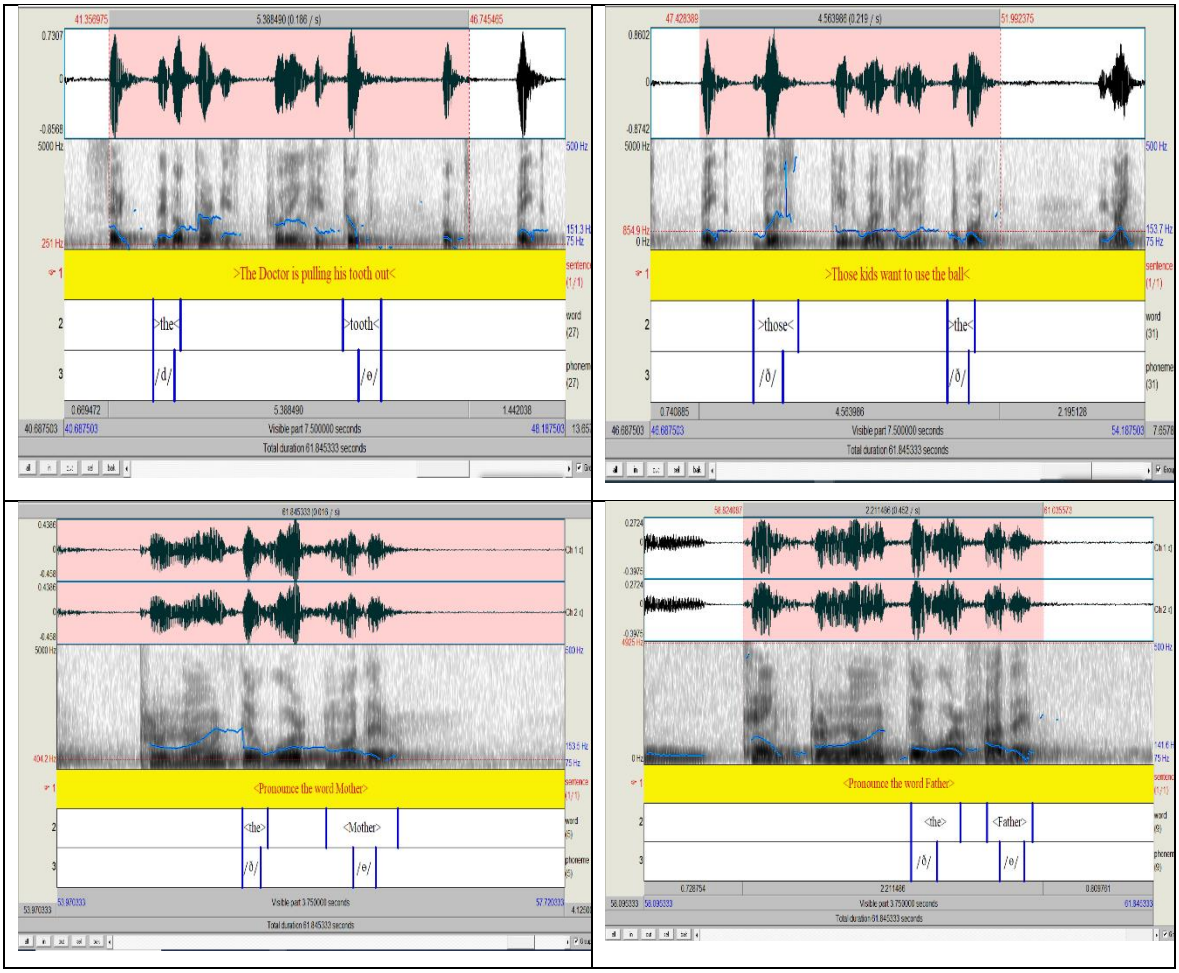




Source: Navas, W. (2022)

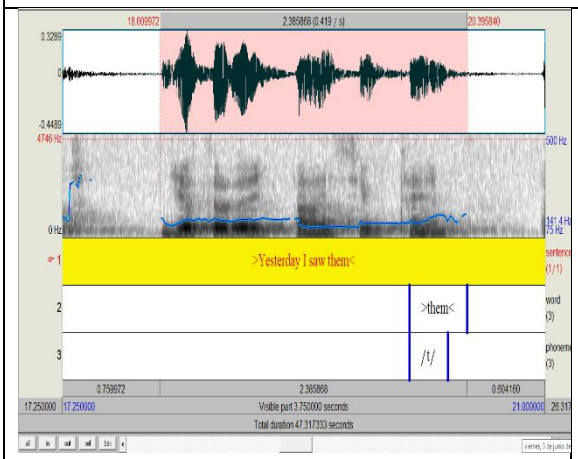
Participant 4, bilingual L1 Spanish-L2 English, after implementation of tools

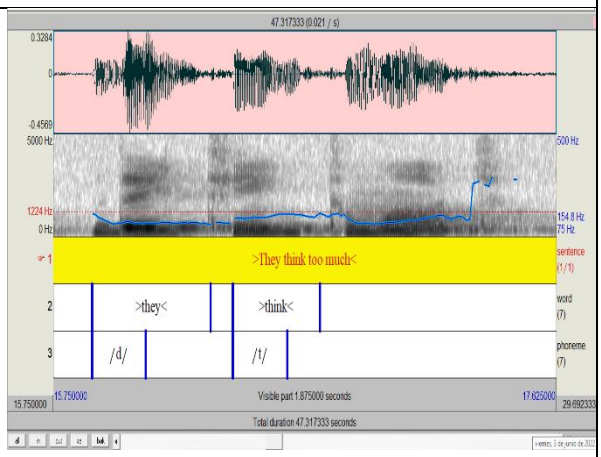


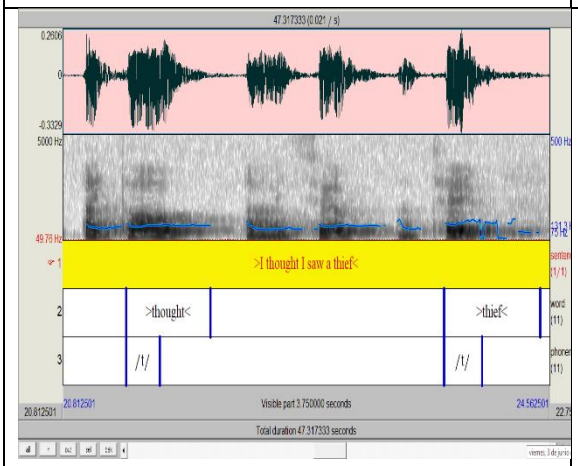


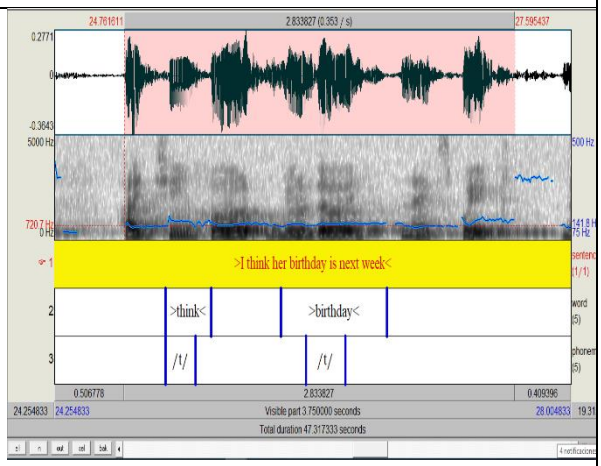
Source: Navas, W. (2022)

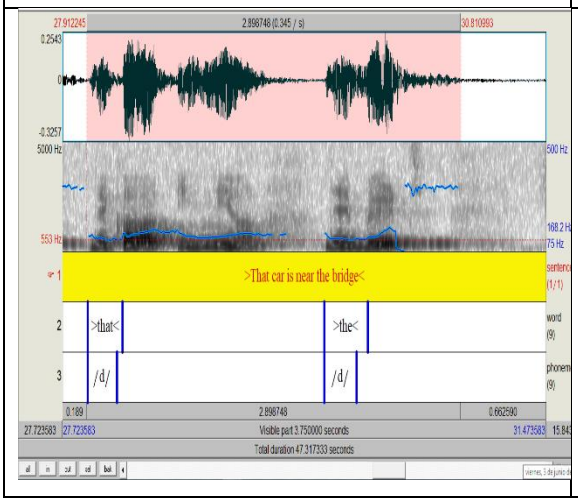
Participant 5, bilingual L1 Spanish-L2 English, before implementation of tools

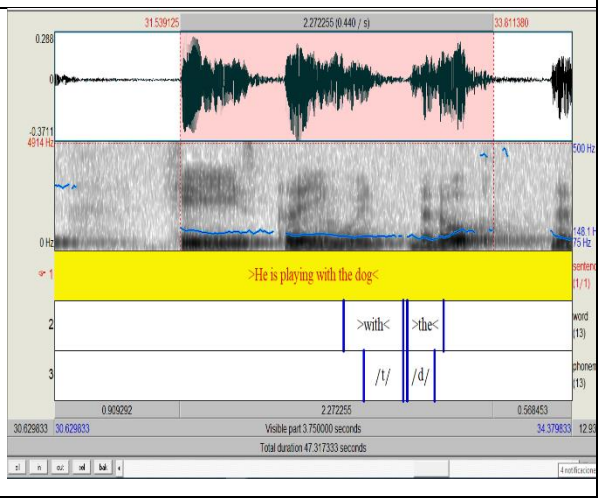


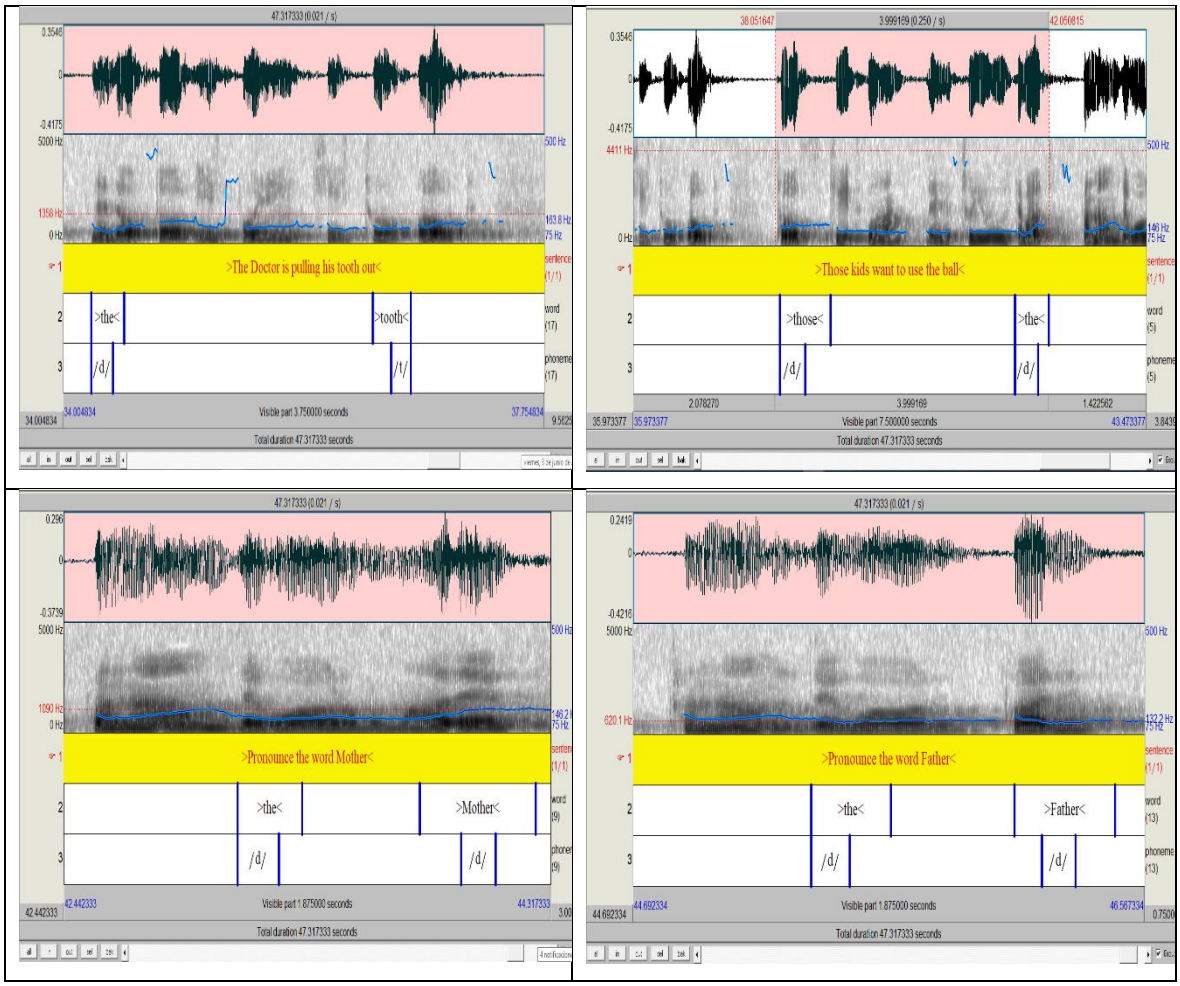






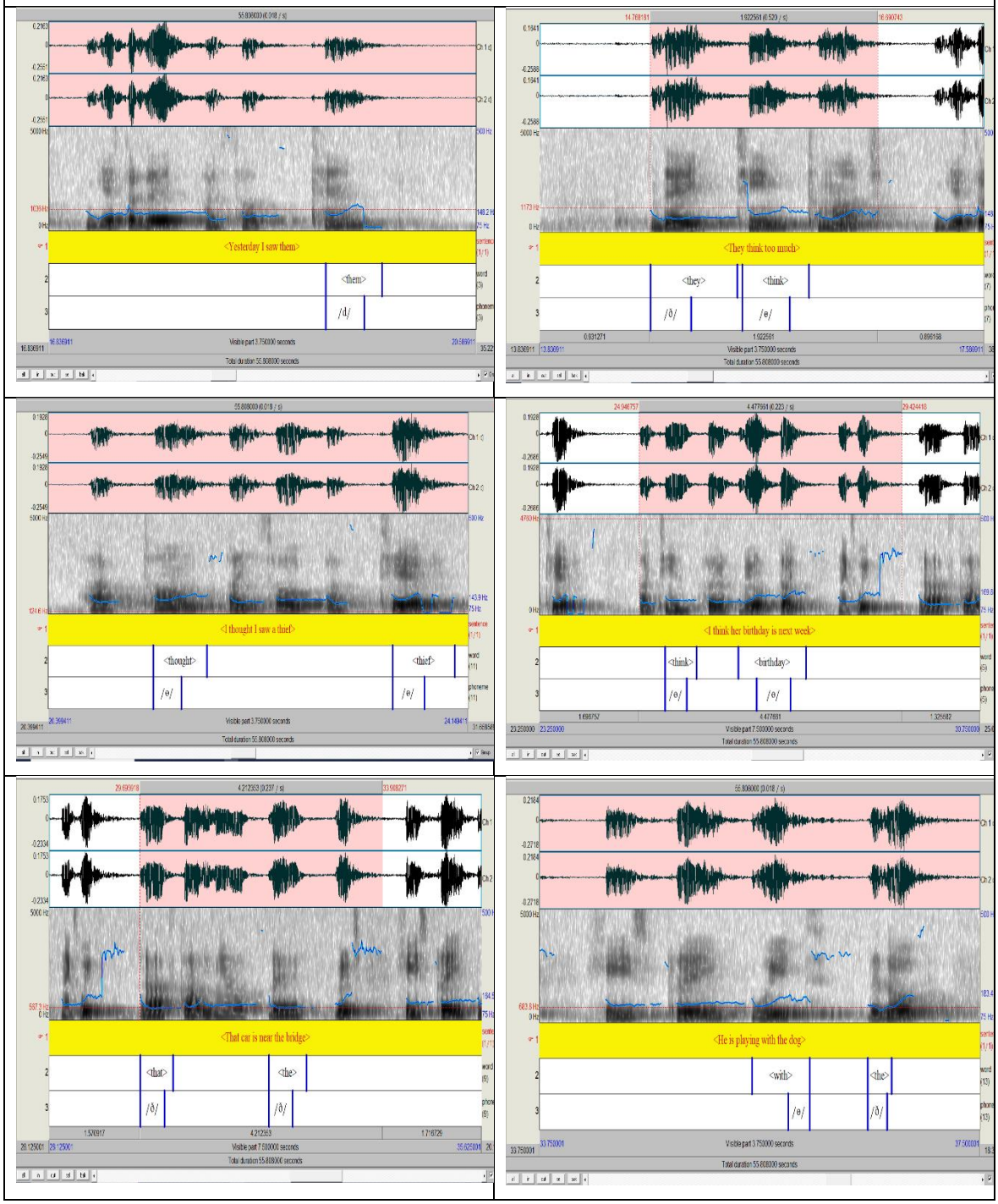


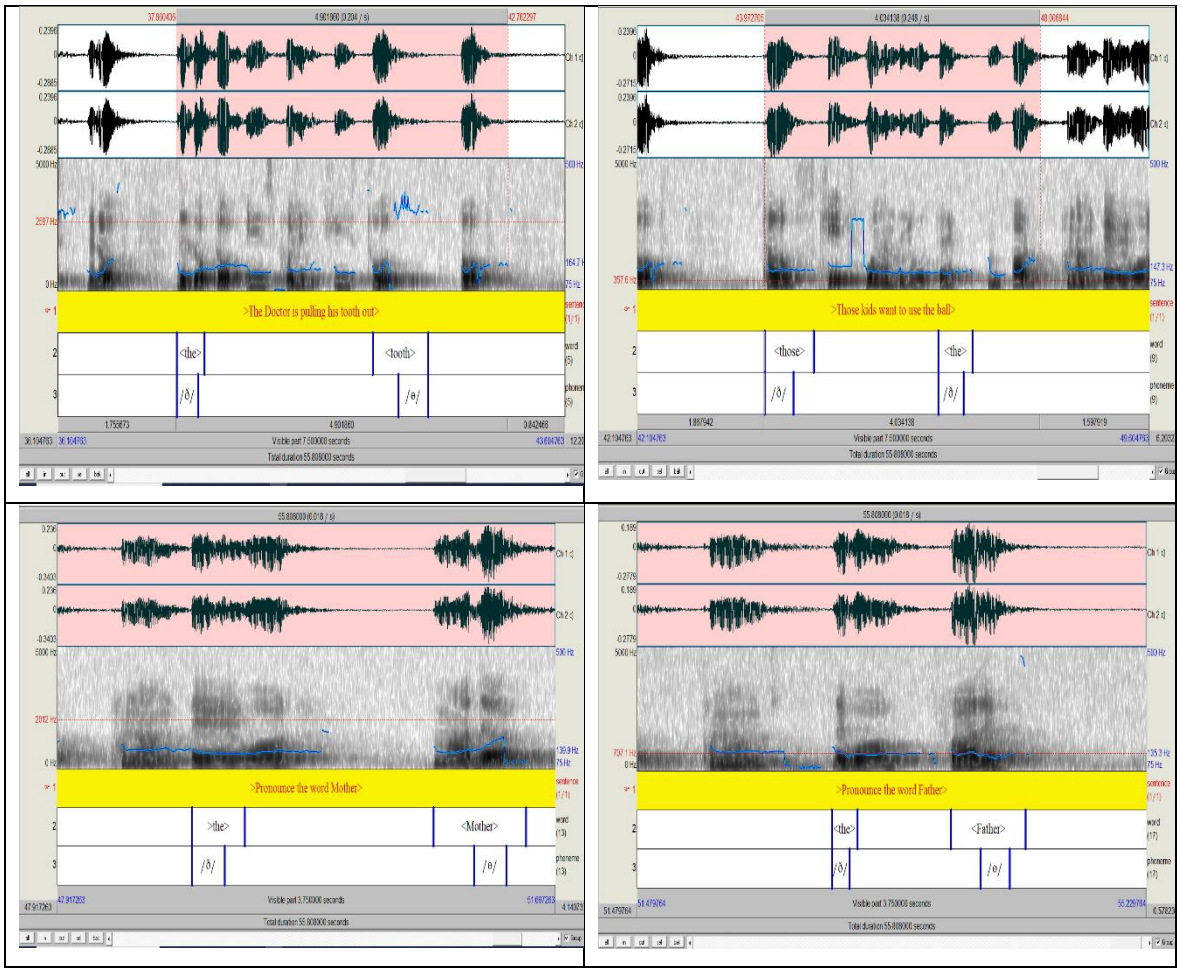




Source: Navas, W. (2022)

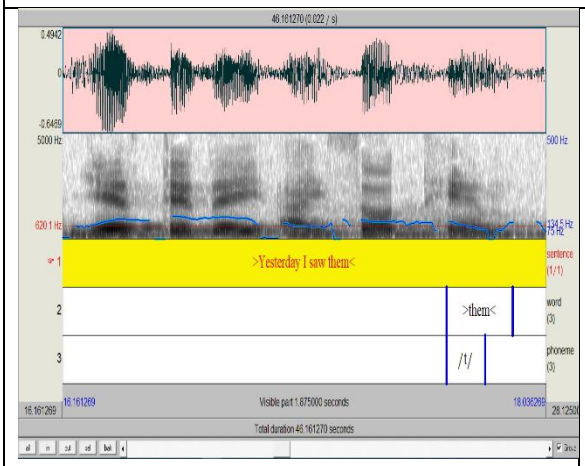
Participant 5, bilingual L1 Spanish-L2 English, after implementation of tools

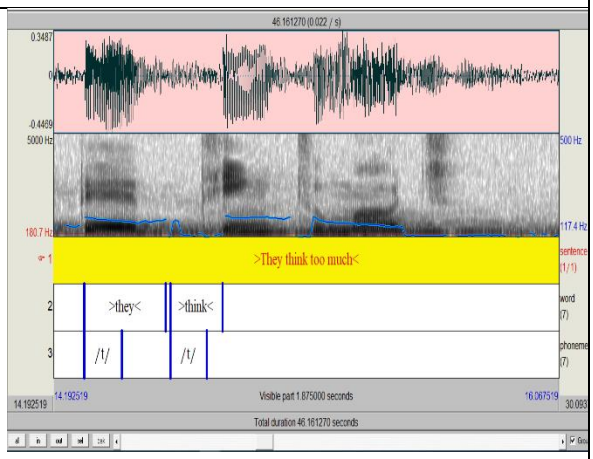


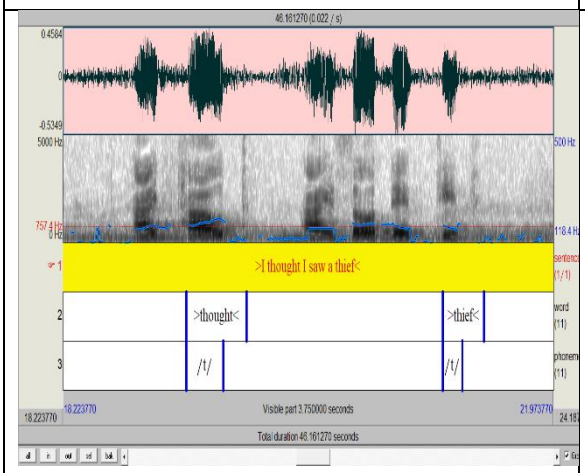


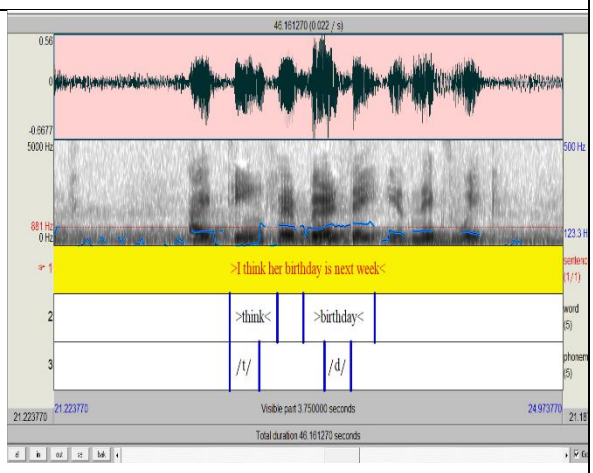
Source: Navas, W. (2022)

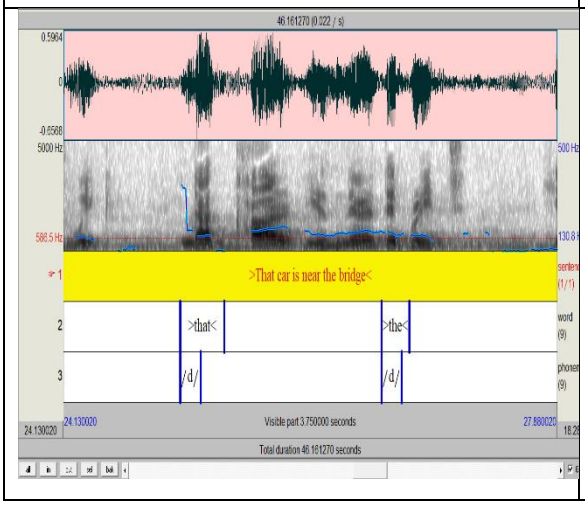
Participant 6, bilingual L1 Spanish-L2 English, before implementation of tools

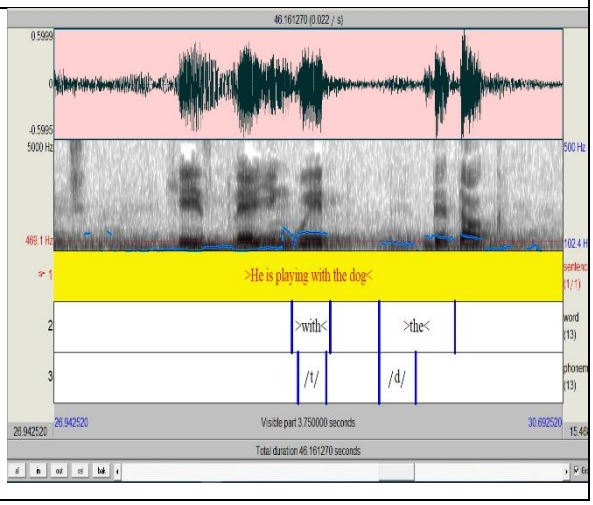


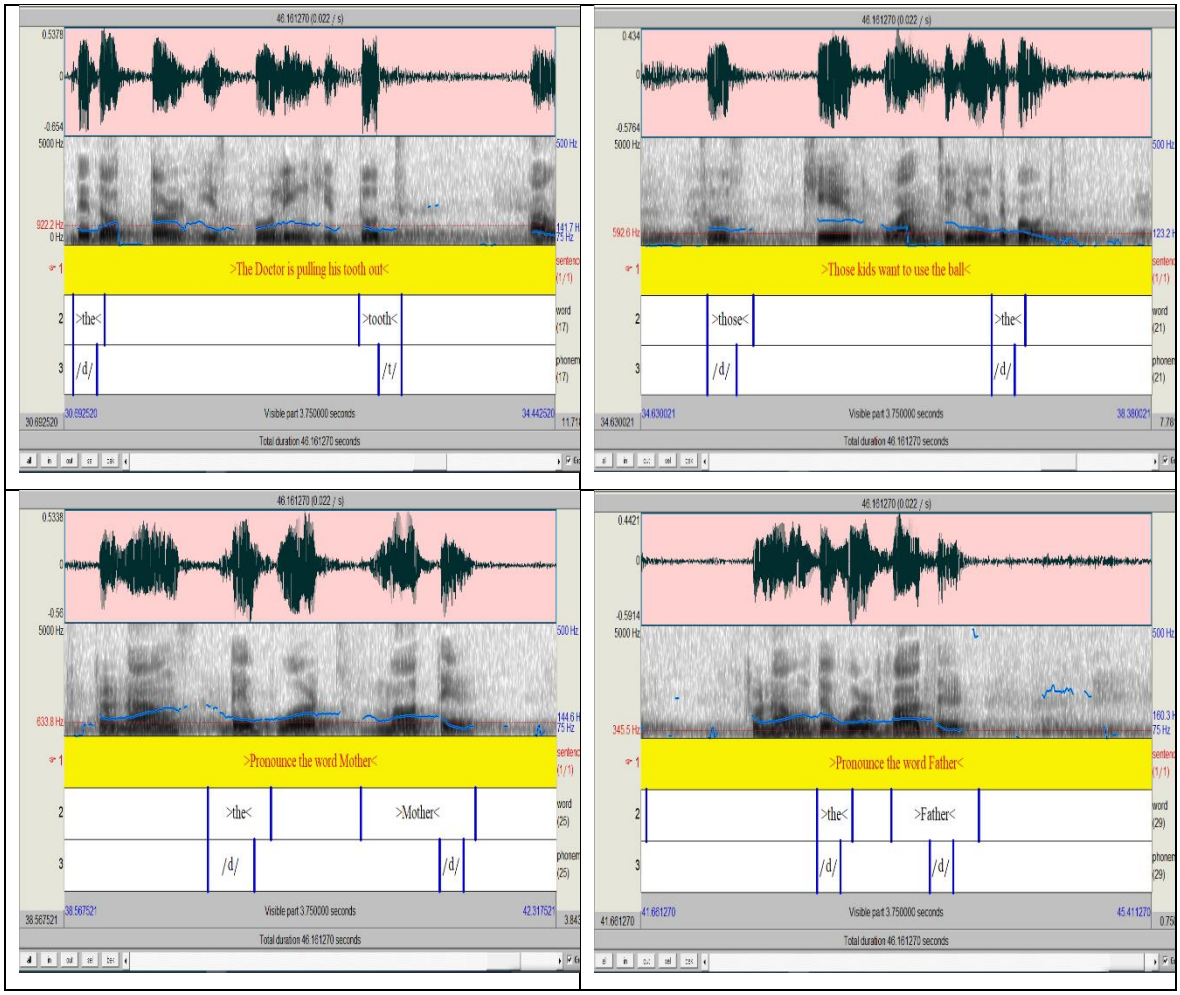






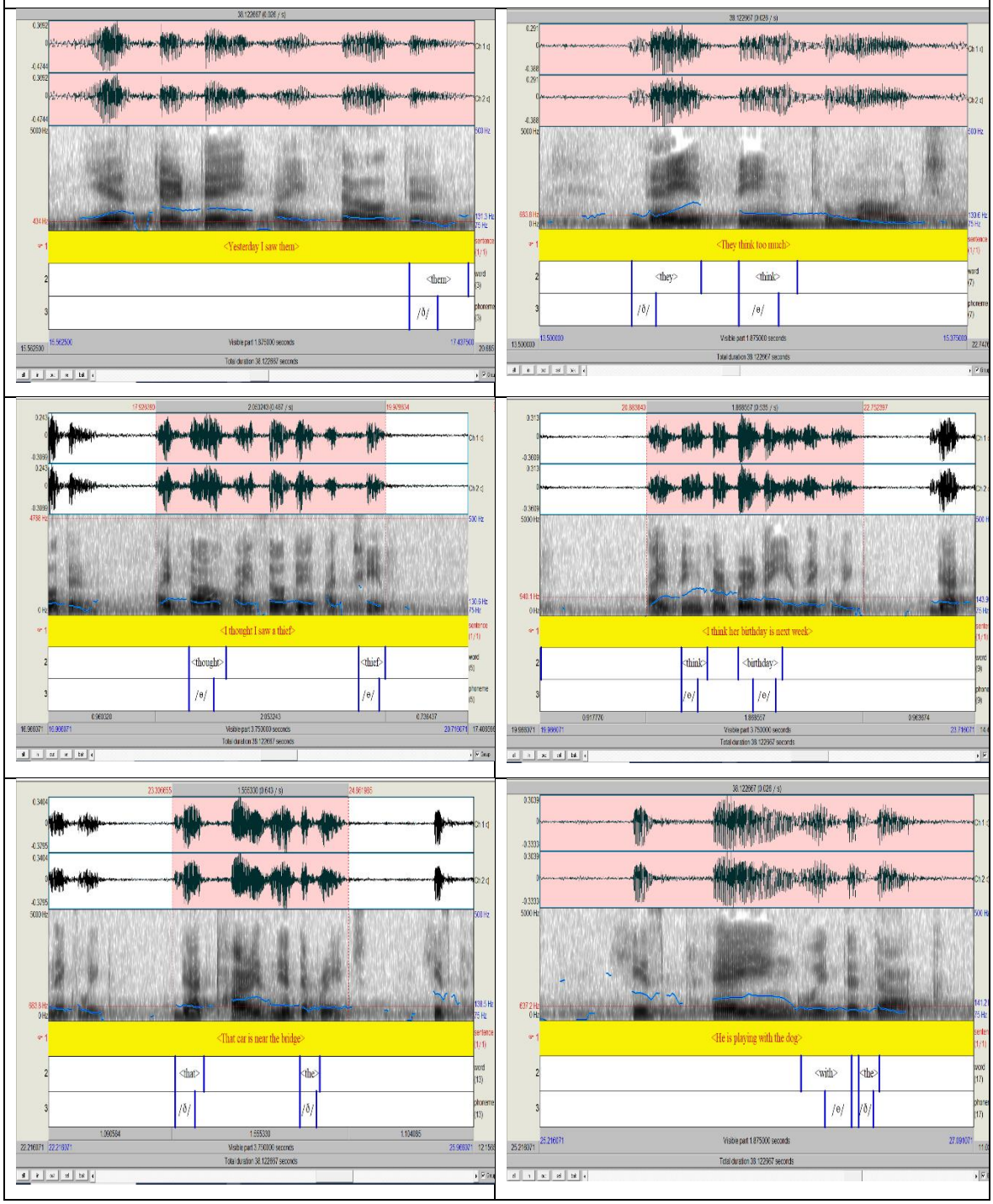


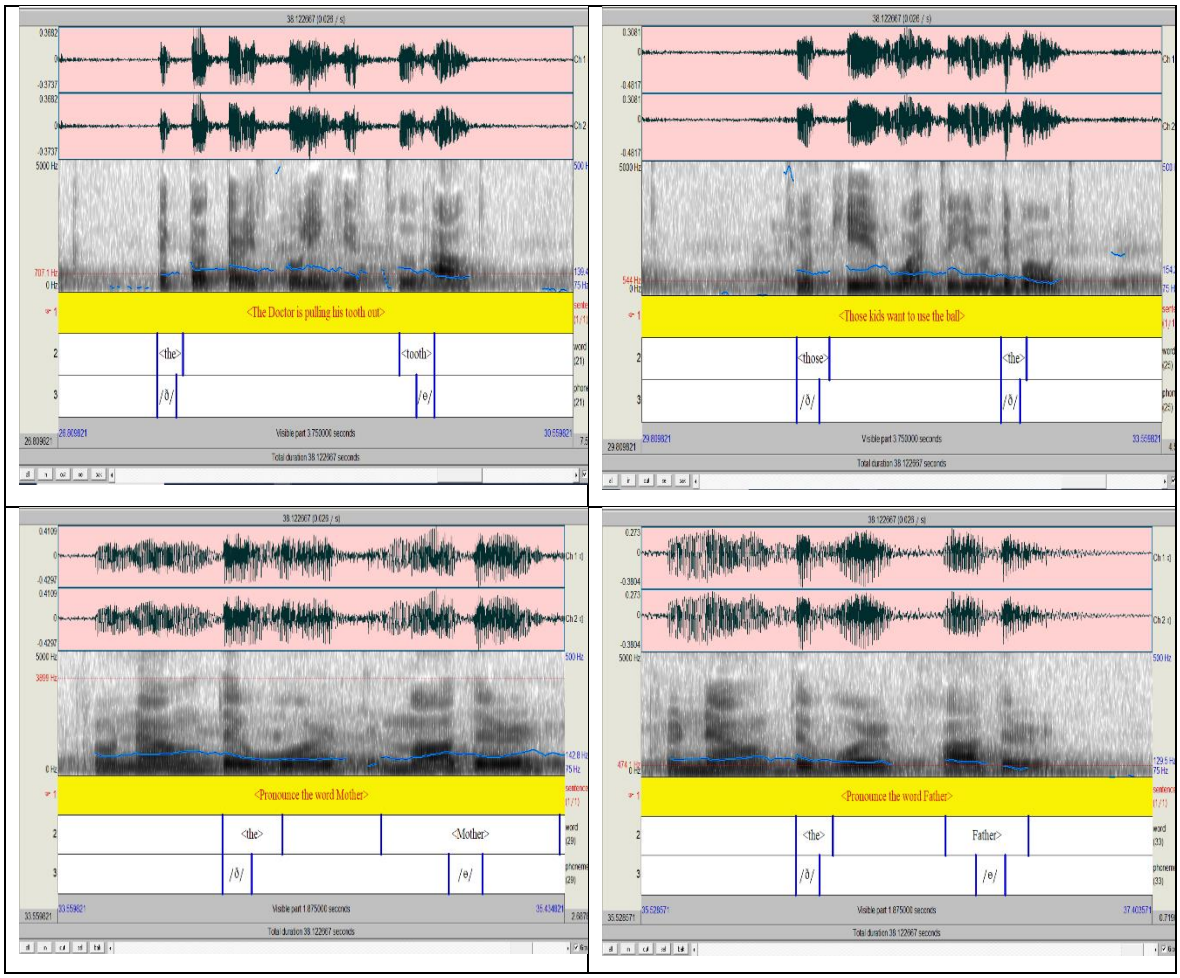




Source: Navas, W. (2022)

Participant 6, bilingual L1 Spanish-L2 English, after implementation of tools





Source: Navas, W. (2022)