Universidad de Chile
Facultad de Filosofía y Humanidades
Departamento de Lingüística

PHONOLOGICAL CONTRASTIVE ANALYSIS AND ERROR ANALYSIS, AND THEIR CONTRIBUTION TO THE ELABORATION OF A PRONUNCIATION TEACHING SOFTWARE.

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Profesor Guía: Hiram Vivanco T.

Alumnas Participantes: Javiera Adaros S.
Consuelo Gajardo M.
Ximena Galaz G.
Macarena Herrera M.
Jeannette Morales L.
María Paz Moya M.
Daniela Sánchez M.
Marianne Sánchez P.
Daniela Ubilla B.

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Table of Contents

1. Introduction.

This thesis was based upon an interdisciplinary research project "Information and Communication Technologies (ICT's) for Language Learning and Edutainment in Internet", FONDEF D05I-10243), where we could apply our knowledge about Error Analysis and focus our attention on five of the phonological processes that occur when Chilean-Spanish native speakers from Santiago, attempt to pronounce words in English. We noticed how important the teaching of phonetics is when learning a foreign language, English in this case and how it has been treated by the current trends in teaching foreign languages, which leaves it aside or ignores it. According to different studies, "formal phonological instruction results in improved student accuracy of pronunciation."[1]

For this reason, we thought our participation in the project mentioned above as a crucial contribution to the development of a software for secondary-school students to practise the English they learn in the classroom. We were aware of the fact that we could not demand much from their pronunciation, but we also knew that it was important to emphasise the allophonic differences that many times change the meaning of a word, so we agreed on the criteria used to work on the samples that we got from the project. From here, we decided to start our own research on the words recorded by a certain group of speakers.

According to theories on Error Analysis (EA), the errors made by the speakers are considered to be a useful device in the process of Second Language Acquisition, and by doing our research, we will attempt to provide examples of these errors and how they affect the intelligibility of a word. At the same time, and as a way to complement our investigation, we considered some aspects of Interlanguage that are rarely taken into account when dealing with SLA and phonetics, mainly the psycholinguistic processes which help the development of the learners' interlanguage.

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[1] Arteaca, Deborah L. 2000. "Articulatory Phonetics in the First-Year Spanish Classroom", in *Modern Language Journal, 84*, 339-354.

As it was said before, we will want to highlight the importance of the allophonic features of words uttered by native Chilean-Spanish speakers and the possible errors they will make by doing so.

2. Hypothesis.

EA can give an account of the total number of possible deviant forms from our selection of English words when being uttered by non-native speakers of English, specifically, speakers from Santiago, Chile, where negative transfer from the speakers' NL will prevail. For instance, the sounds which are more similar to the speakers' mother tongue phonological system will be easier to pronounce than those which greatly differ from the NL of the speakers. Also, the chosen group of Chilean-Spanish speakers will generalise and expand the source of each error to all phonological environments in the different words they will be asked to pronounce. Finally, the feedback with the correct pronunciation of the utterances will be useful in the speakers' production of the target sounds, thus their performance will improve when correcting some of the total number of errors they make when eliciting the words.

3. Objectives.

General Objectives.

- To apply theoretical knowledge about Error Analysis to English words pronounced by Chilean Spanish speakers from Santiago with basic knowledge of English.
- To predict phonological errors by the speakers mentioned above when eliciting isolated English words.

3. 2. Specific Objectives.

- To choose a corpus of words that contains the majority of the English consonant sounds to be uttered by Chilean-Spanish speakers.
- To predict the possible errors in the chosen group of words.
- To score the deviant forms of the chosen words from 1 to 5 according to different criteria on EA.

- To grade the signals recorded and elicited from the group of Chilean-Spanish speakers.
- To establish the phonological processes to be taken into account –Addition, Elision, Metathesis, Substitution, Graphemic Interference, Change of Accent- when analysing the signals.
- To give an account of the total number of processes found in the signals uttered by the group of speakers.
- To establish the number of appearances in percentages of the different phonological processes to be taken into account.
- To establish the most common processes in the deviant forms of the chosen words when uttered.
- To transcribe the audio files uttered by the informants by means of phonetic symbols.
- To compare the deviant forms predicted by the seminar group with the forms produced by the informants in order to establish how many of the forms we foresaw actually occurred.
- To establish how many new forms will be uttered by the informants.

4. Methodology.
4. 1. Nature of Research.

This research is mostly of quantitative character, as its data has been ranked in a numeric scale from 1 to 5, and consequently it has been analysed in terms of percentages. However, there are certain qualitative elements involved such as intelligibility, and the different phonological processes.

On the other hand, since there is a vast amount of studies on EA theory, it is not possible to insert it within an exploratory framework, but it will rather serve as a material of application. Yet, its originality relies on the association of two different research projects aimed to make a contribution in the pedagogical and linguistic fields respectively.

4. 2. Data.

The present research relies on data acquired in the searching process of the proper lexical input for a software, designed to be used for pedagogical purposes in the Second Language Acquisition of English. In this task, it was necessary to divide our work into five different stages:

Firstly, common possible errors made by Chilean Spanish speakers were predicted. In this respect, the group was divided into five pairs of students which were assigned a type of sound each, according to the manner of articulation. i.e. fricatives, plosives, nasals and affricates in different phonological contexts, that is to say, in initial, middle and final position, and being preceded and followed by consonants or vowels.

Secondly, it was established a selection of words which involved certain difficulty in their pronunciation according to the sounds previously predicted, and which also contained all the English phonemes in different environments. This task led to the resulting corpus of the following utterances:

against, behave, boyfriend, burst, chocolate, college, doesn't, example, George, handsome, hospital, mouth, ringing, scientist, should, special, student, television, thirty-two, thousand, tourism, vegetable, vibration, wouldn't, yesterday.

4. 3. Universe.

In the third stage, based on this selection, we took the production of these words by nine informants— four men and five women— all of them adults of either sex whose ages range from 18 to 26 years old, having in common the fact of being natives of Chilean Spanish, and having finished secondary education. They all had basic knowledge of English, and even though there were still some differences regarding their background of the language, we thought that this fact would not affect the results of the investigation.

The process of gathering the data consisted in one session where the words mentioned above were recorded in a computer at the Speech Processing and Transmission Laboratory at the Department of Electrical Engineering of Universidad de Chile, by means of two basic-quality microphones, specifically Genius® and 4Q®, which were expected to be of easy access to any

family, and one called Shure® model PG48, which was the high quality counterpart. They were located at five centimetres from the speaker's mouth. The program used for this purpose was Cool Edit Pro® 2.0.

The recording was carried out in two steps. In the first one, all nine subjects had to read the words aloud, and in the second one, they were asked to pronounce them after having listened to a recording made by a linguist.

The fourth stage was our first meeting to listen to some samples and agree on the criteria we would use. This experience was taken as a rehearsal of what we would do later.

The fifth stage consisted of the assessment of the data which was realised considering the following criteria: intelligibility, pronunciation of consonants, and taking into account only significant vowel and diphthong change and stress shift. The scores to be given ranged from 1 to 5, where 5 represented the target pronunciation and 1, the most deviant form. It is worth noting that we took RP and GA as acceptable pronunciations.

Finally, all the resulting varieties were distributed in a chart, in order to give an account of the phonological processes involved, to verify if we came to an agreement regarding the criteria used, and to corroborate the predictions made at the beginning.

4. 4. Definition of Variables.
4. 4. 1. Operational.
- Selection of words.
- Recording of selected words.
- Analysis of the corpus gathered.
- Interpretation of the data, providing statistics of the analysed results.
- Amount of mistakes, criteria of evaluation: type of errors, assessment of each word in a range form 1 to 5.

5. Theoretical Framework.

5.1 Interlanguage.

Theories of SLA are the offspring of general linguistic theory. Though some current theories could be considered more accurate than earlier ones, there is not only one approach that could solve language learning problems. This is a field that requires plenty of investigation, and new theories are being developed.

We based our research on the contributions of several authors dealing with Second Language Acquisition. All of them deal with the different processes involved, the varying strategies the learner may use, and the main concepts embraced in SLA which were dealt with from different perspectives by the authors studied. We will refer to some of the main theories of SLA, and explain their main concepts and features.

In "Approximative Systems of Foreign Language Learners" William Nemser states that the contact situation should be described not only by reference to the Native Language (NL) of the learner (L_s = source language) and the Target Language (L_t), but also by reference to a learner Approximative System (L_a). According to him, different systems, being represented in a contact situation, are classified regarding their function:

1. The Target Language: is the language the learner attempts to learn and use.
2. The Source Language: is the learner's mother tongue, NL, or also L_1. This source language often interferes when the learner uses the TL.
3. Approximative System: is the deviant linguistic system actually employed by the learner attempting to utilise the TL. This Approximative System varies according to the learner's level of proficiency, and this variation can be also introduced "by learning experience, communication function, personal learning characteristics, etc." (Nemser, W. 1971: 55).

In order to identify any type of approximate system some assumptions must be explained:
- Firstly, at a given time, the internally structured learner speech is the product of the L_a which differs from L_s and L_t.
- Secondly, the different stages of the speaker's process of learning is represented

by L_1, therefore, if it is necessary to show the three different stages of learning experienced by the speaker, this should be displayed as follows: L_{a1}, L_{a2}, L_{a3}, and so on.

- Thirdly, "in a given contact of situation, the L_a's of learners at the same stage of proficiency roughly coincide, with major variations ascribable to differences in learning experience." (Nemser, W. 1971: 56).

Concerning Approximative Systems, Jack C. Richards and Gloria P. Sampson (1974) point out that with the emergence of the notion of language as a system, SLA could be viewed as the juxtaposition of two systems, which could lead to a new super language which combines features of both systems (Fries and Pike, 1949) or to intersystemic interference (Weinreich, 1953).

Some of the assertions closely associated with contrastive studies are the following: "The learner behaviour is predictable on the basis of a comparison of L_s and L_t." (Nemser 1971: 60), and by this means, it would be viable to "indicate a strategy for language pedagogy." (Nemser 1971: 62). However, some problems arising here indicate that there are serious limitations in this approach, because the speaker's process of learning cannot be thoroughly illustrated by reference to L_s and L_t, but also by reference to L_a.

Moreover, "the various levels of linguistic structure are interdependent" (Nemser 1971: 60), which means that if we want to study the level of phonic interference, we do not only need the phonological systems of L_s and L_t, but also the grammatical level, the lexical level, etc.

Consequently, the direct examination of the L_a has become of major importance for the contrastive approach, since it is possible to appreciate systematic levels of learning in which the insertion of new elements is relevant, affecting either in a positive or negative way; applying it to language teaching and reformulating the descriptions of L_s and L_t, permitting a better projection of L_a through its different stages. We perceive that the learner does not only possess knowledge about his L_s but also about the L_a. Regarding this, Contrastive Analysis (CA) considers that it is important to have L_a as a reference when predicting the next or subsequent learning behaviour.

Finally, it is remarkable that L_a forms evaluative gradations towards specific languages, taking into account the process that lies between L_s and L_t.

According to Richards and Sampson, the main drawback of CA was that it paid too much attention to the grammar of the two systems, leaving phonology and lexis behind. Recently, it has been suggested that the learner's system as a whole should be investigated. That is why current researchers tend to focus on the learner as a generator of the grammar of the sentences in the new language. The learner's partial success is seen as a representation of evolving systems of grammatical and phonological rules.

The authors mentioned above distinguish seven factors which may influence and characterise these second language systems:

1) *Language Transfer.*
 Interference from the mother tongue is considered to be the main (though not the only) source of difficulty by linguists doing CA.

Interference Analysis tends to be from the deviant sentence back to the mother tongue whereas CA works the other way.

George (1971) found that one third of the deviant sentences could be attributed to language transfer; though it would be almost impossible to evaluate the amount of systemic interference due to language transfer alone, since a number of factors interact determining the learner's Approximative System.

2) *Intralingual Interference.*
 The term was coined by Richards, and it refers to items that do not reflect the structure of the mother tongue but are generalisations based on partial exposure to the TL.

Richards noted subcategories of error types as learners develop hypotheses about the structure of English. Like first language learners, second language learners develop these

hypotheses that correspond neither to the NL nor to the TL. Many intralingual errors represent the learning difficulty of low level rules in the TL.

3) *Sociolinguistic Situation.*

The relationship holding between the learner and the TL community may influence learning. Particular motivations and the effects of the socio-cultural setting are included here.

Different settings motivate different processes of learning, such as:

- Compound bilingualism: two lexemes are identified with a single concept if the learner is rather bilingual at home (e.g. English 'bread' and French 'pain' if the two lexemes are learned in the same setting).
- Co-ordinate bilingualism: if the two lexemes are learned in different contexts, they might be stored separately by the learner.

It is useful to focus on the relations between the opportunities for learning and the learner's developing system:

- English as a Foreign Language (EFL): opportunities provided by the school course.
- English as a Second Language (ESL): opportunities provided outside the school program.

Another distinction is also important, the type of motivation:

- Instrumental type of motivation: the language is learned for utilitarian purposes and not as a means of integration with other linguistic groups. It is said to be accurate for goals in the short term.
- Integrative type of motivation: it refers to the necessary motivation for the laborious task of acquiring a language.

4) *Modality.*

Modality of exposure to the TL and the modality of production are other factors that may influence the learner's language. Production and perception may involve the acquisition of two

partially overlapping systems. Interference is usually on the productive rather than on the receptive side.

5) *Age.*

 A person's memory span increases with age, being able to acquire a greater number of abstract concepts. In this line, adult language learning could be easier in terms of vocabulary. On the other hand, because of children's inability to plan ahead more than a few words, there is an important limitation on the length of the utterances produced by them. Nevertheless, children are better imitators of speech sounds, and acquisition of syntax is also easier for them.

 We cannot make any categorical statement about the relationship between age and language learning. McNamara (1971) and Kennedy (1973), quoted by Richards and Sampson 1974, see differences related to age in terms of the motivational and situational differences.

6) *Successions of Approximative Systems.*

 This factor concerns the lack of stability of the learner's Approximative System due to the continuing improvement in learning the TL. Yet, the general direction which the learner's system takes may be predictable (Whinnom 1971, quoted by Richards and Sampson 1974).

 Most studies of second language learners' systems have dealt more with the productive side than with the comprehensive side. Is the grammar by which the learner understands speech the same as that by which he produces speech? The distinction between receptive and productive competence may be useful, since many elements are observed to go through a stage where they are sometimes used and sometimes omitted. Thus, if rules for items or structures unique to learners' Approximative Systems are to be written, it is important to reflect their probability of occurrence.

 Rules characterising the Approximative System may cover data which have no source in either the NL or TL. Such data is strong support for the autonomy of Approximative Systems as distinct from native and target systems.

7) *Universal Hierarchy of Difficulty.*

This factor has to do with the inherent difficulty of certain phonological, syntactic or semantic items and structures available.

If a hierarchy of difficulty is postulated for learners of a given language background, it must include not only interlanguage difficulties, but also take into account a possible universal hierarchy of difficulty.

The concept of difficulty may be presumed to affect the learner's learning strategy (organisation of what he perceives) and his communication strategy (organisation of what he produces). Focusing on such strategies directs attention to the cues the learner uses to identify elements in the new language.

8) *Significance of the Learners Systems.*

The seven factors explained above suggest that the Approximative Systems of learners are in fact much richer in linguistic, pedagogic and social significance than assumed. There is not a linguistic paradigm that compares them all, because they are the result of social, psychological and linguistic interactions.

Conclusively, Approximative Systems are necessary stages in the acquisition of the target system, which result in a deeper understanding of language in general. Therefore, having explained Approximative Systems, it is now necessary to present other theories of SLA.

Firstly, in "Idiosyncratic Dialects and Error Analysis" S.P. Corder (1971) describes the second language of a learner as an idiosyncratic dialect, which is not the language of a social group. In an idiosyncratic dialect, some of the needs to account for the learners' language will be the same as those required to account for the TL. That is to say that, from the linguistic viewpoint, the learner's language is a dialect, considering dialects as two languages which share some rules of grammar. This dialect is meaningful, systematic, regular, and describable in terms of a set of rules. S.P. Corder regards this dialect as unstable, and not as a 'langue' for its conventions are not shared by a social group, as many of its sentences present problems of interpretation to any native speaker of the TL.

Corder's definition of *idiosyncratic dialect* is similar to what Selinker (1969) has proposed by the name of *interlanguage*, which we are going to explain later. As this dialect is not yet part of a social dialect, S.P Corder does not refer to the idiosyncratic sentences of the second language learner as *deviant* nor as *incorrect* or erroneous, for sentences are idiosyncratic precisely because the rules of the TL are not yet known, and one of the objectives of studying the learner's language is to discover why it is as it is, and to discover what underlies the learning process. However, if these sentences are called *ungrammatical* or *erroneous*, there would be an explanation implied before making a description. And, while it is true that these sentences cannot be accounted for by the rules of the TL, they are in fact *grammatical* in terms of the learner's language. Although its rules are idiosyncratic and not shared rules, Corder states that the idiosyncratic rules are not unique to an individual but shared by other speakers who have a similar background, aims or linguistic history. Therefore, teachers assume that speakers sharing the same mother tongue and having had similar experiences of learning the second language speak akin interlanguage, and the only differences can be assigned to individual difference in intelligence, motivation, and attitude. This assumption may lead to the belief that all such learners follow a similar development in acquiring a second language. Nevertheless, Corder suggests that it is difficult to find it out, but what is certain is that the study of the language development of a second language learner relies on the techniques of EA.

According to S.P. Corder, EA is the methodology used in order to describe what he has called *idiosyncratic dialects*. He explains that there are some stages involved in EA.

The first stage is *recognition of idiosyncrasy,* in which it is possible to enunciate a general law. Every sentence is to be regarded as idiosyncratic until shown to be otherwise. There are two kinds of idiosyncratic sentences:
1. Covertly idiosyncratic: A learner's sentence may be superficially 'well-formed' and yet be idiosyncratic.
2. Overtly idiosyncratic: A learner's sentence may be superficially 'ill-formed' in terms of the rules of the TL.

The end point of the process of recognising idiosyncrasy and the production of a reconstructed sentence is two sentences: the idiosyncratic sentence and a well-formed sentence,

which *by definition* have the same meaning.

The second stage implies accounting for the learner's idiosyncratic dialect. The methodology of description is that of a *bilingual comparison.* In this, two languages are described in terms of a common set of categories and relations, that is, in terms of the same formal model.

Next, the third stage and ultimately object of EA is *explanation.* Whereas the two previous stages have been linguistic, the third one is psycholinguistic, as it attempts to account for how and why the learner's idiosyncratic dialect is of the nature it is.

According to S.P Corder there are two objectives in applying EA:
- Firstly, to elucidate what and how a learner learns when he studies a second language. This is a theoretical object (Corder 1967); secondly, the applied object of enabling the learner to learn more efficiently by exploiting our knowledge of his dialect for pedagogical purposes.
- The second objective states that the applied object of enabling the learner to learn more efficiently by exploiting our knowledge of his dialect for pedagogical purposes.

Finally, Corder asserts that the idiosyncratic sentences of a second language learner bear a regular relation to the sentences of his mother tongue, and according to him, there are two possible explanations for this:
- That the learner carries over the habits of the mother tongue into the second language, a process called *interference,* which implies that the mother tongue prevents the learner from acquiring the habits of the second language.
- That language learning is a data-processing and hypothesis-forming activity of a cognitive sort. In this sense, a learner's idiosyncratic sentences are signs of false hypothesis, which, when more data is available and processed, enable the learner to reformulate a hypothesis more in accordance with the TL. (Hockett, 1948).

Secondly, in *Social Factors, Interlanguage and Language Learning* Jack Richards presents a sociolinguistic approach to L_2 acquisition. He based his study on the learning of English by immigrants, that is to say, non-standard varieties of English.

Richards uses Selinker's concept of *interlanguage* which is used to interpret immigrant varieties of English as interlanguages generated from the social circumstances under which English is acquired in particular settings. Selinker's definition of interlanguage focuses on the psycholinguistic processes presumed to contribute to interlanguage:

a) *Language transfer:* if fossilisable items, rules and subsystems that occur in interlanguage performance are a result of the native language;

b) *Transfer of training:* if fossilisable items, rules and subsystems are a result of identifiable items in training procedures;

c) *Strategies of second language learning:* if they are a result of an identifiable approach by the learner to the material to be learned;

d) *Strategies of communication:* if they are a result of an identifiable approach by the learner to communication with native speakers of the TL;

e) *Overgeneralisation of linguistic materials:* if they are a result of a clear overgeneralisation of the TL*,* then we are dealing with overgeneralisation of the TL.

Richards states that regarding this model, the acquisition of a new language by an immigrant group is always a developmental creative process. The learner may simplify the syntax of the language in an effort to make the language an instrument of his own intentions. This sort of strategies affects both first and second language performance in English. Simplification is one way in which speakers of different languages can make a new language easier to learn and use.

The notion of *interlanguage* shows us that there are rules which are linguistic in origin and derivable from the mother tongue and from limited exposure to the TL; and rules which are social in origin, derived from communication and learning strategies.

Then, the concept of *Language Transfer* can be used to character geographically defined varieties of English as a second language. Richards uses the term *mistake* (or sign of incomplete

learning) to refer to all the differences between the learner's use of English and overseas English (in the foreign language settings).

Thirdly, from a psycholinguistic point of view, Larry Selinker (1972) assumes that there is a psychological structure that is latent in the brain, and which is referred to as *latent language structure,* which according to Lenneberg, is an already formulated arrangement in the brain, seen as the biological counterpart to universal grammar, and transformed by the infant into the realised structure of a particular grammar in accordance with certain maturational stages.

The concept of *interlanguage* appears again, and the author suggests that there are five central psycholinguistic processes which establish the knowledge that underlies interlanguage behaviour, and that exists in the latent psychological structure, which were dealt with formerly.

Another term he introduces is *fossilisation,* which refers to the mechanism that exists in the latent psychological structure and corresponds to those linguistic items, rules, and subsystems which speakers of a particular NLwill tend to keep in their interlanguage relative to a particular TL (Selinker 1972).

After having described the main concepts presented by different authors in relation to SLA, it is now important to refer to the types of "errors" made by learners learning a second language, according to these same authors.

In *"A Non-contrastive approach to Error Analysis"*, Jack C. Richards (1971) focuses on several types of errors that do not derive from transfers from another language, which are different from the interlanguage errors, caused by the interference of the learner's mother tongue.

Intralingual and developmental errors are frequent, regardless of the learner's language background; they reflect the learner's competence at a particular stage, and illustrate some of the general characteristics of language acquisition, i.e. they reflect the general characteristics of rule learning, such as faulty realisation, incomplete application of rules, and failure to learn conditions under which rules apply. *Developmental errors* illustrate the attempts by the learner to construct hypotheses about the TL from his restricted experience of it in the language classroom or in texts.

Their origins are found within the structure of English itself, and through reference to the strategy by which a second language is acquired and taught, representing final grammatical competence in some learners, and indications of transitional competence in others.

Richards classified the source of errors in four main categories:

1. Over-generalisation: Over-generalisation implies that there are instances in which the learner creates a deviant structure on the basis of his experience of other structures in the TL, i.e. involves the creation of one deviant structure in place of two regular structures. This type of error is associated with redundancy reduction.

2. Ignorance of rule restrictions: This implies the application of rules to contexts where they do not apply, which is a failure in observing the restrictions of existing structures. This is a type of generalisation since the learner is making use of a previously acquired rule in a new situation.

3. Incomplete application of rules: In this category we find the occurrence of structures whose deviancy represents the degree of development of the rules required to produce acceptable utterance.

4. False concepts hypothesised: They derive from faulty comprehension of distinctions in the TL. These are sometimes due to poor gradation of teaching items. And many errors that appear in course books are due to the contrastive approach they use in teaching a second language, having quite different results from those the teacher's intend.

Another author, Mahavir Jain, presents the importance of the learner's errors in his paper "Error Analysis: Source, Cause and Significance". The author explains that the conceptual framework for the study of error source and significance based on contrastive study is inadequate as it is fragmentary, for it disregards many errors that the learner makes notwithstanding his language background. For this reason, the author seeks to suggest, firstly, that there is a system in the learner's errors and, secondly, the importance of learner's errors, as they give insight on the psychology of second language learning. He makes the distinction between three kinds of errors:

1. Systematic errors: are errors which fall into definable patterns; they show a consistent system, are internally principled and free from arbitrariness. Most of these errors do

not stem from L_1 interference, but they are rooted in the learning strategy to reduce speech to a simpler system, a process which is best effected through generalisations.

2. Asystematic errors: these are errors which do not exhibit a rule patterned consistent system: they are not always internally principled; yet they are not totally arbitrary. That is to say, there are certain generalisations that remain as hypotheses, and the learner is unable to give them the status of rules, and he is not able to apply these hypotheses with any degree of consistency.

3. Unsystematic errors: these errors are slips of the tongue caused purely by psychological conditions such as intense excitement, and/or physiological factors, such as tiredness, which change from moment to moment and from situation to situation.

In the following paragraphs we present some of Selinker's ideas presented in 'Rediscovering Interlanguage' (1992).

In Chapter 10, 'Reframing Interlanguage: Where we are', he aims at updating certain concepts of Interlanguage and Second Language Acquisition and states that there are certain needs in it, especially a richer Language Transfer perspective which would include translation phenomena. Therefore, translation equivalents are regarded as an important strategy for learners as they look across linguistic systems, hence, study of translation equivalents should be included in the research of SLA studies.

Selinker proposes that "(...) there is the need to build on "Kellerman's suggested laws of Language transfer by investigating what is taken as given in his formulation, that the learner establishes a correspondence between surface forms across linguistic systems" (:260).

Selinker reinforces the Interlanguage notion of the existence of a partially separated linguistic system united by what Weinrich has called "Interlingual identifications". He points out that there is the demand for plausible reality of interlingual identifications at the level of deep-structure grammatical transfer.

Interlingual identification is the mechanism that links units across linguistic systems. It is the basic SLA learning strategy. Learners regularly compare what they produce in interlanguage with a perceived target, setting up interlingual identifications. Selinker argues that there is the need for a reframed general linguistics which, according to Wode (1984), would recognise the all-pervasiveness of language transfer as a linguistic phenomenon and would be able coherently to handle contrastive and interlingual data. Thus, a general linguistics which tests CA and SLA hypotheses is needed (:261).

Regarding fossilisation, the author comments that it is a complex phenomenon with varying definitions in the literature, but it is agreed to be central to interlanguage concerns. He points out that research effort must focus on sorting out individual differences from social groups.

As a final remark, Selinker argues that 'the sociolinguistically based SLA work rarely integrates concerns of Universal grammar, which should be included in any proposed general laws on SLA, given the reality of deep-structure grammatical transfer' (:264). Therefore, the author concludes that current conceptualization of theory in SLA is limited and limiting. In reframing the interlanguage debate, it is necessary to investigate the particularities of fossilisation and language transfer within a broad conceptual and historical framework.

Conclusively, all these authors dealt with the different processes involved in SLA, stating that, on the one hand, the study of the learner's errors would allow for the formulation of rules for the interlingual systems of the learners, and on the other, that EA and contrastive studies are not entirely appropriate in the prediction of the learners' errors, as they heavily rely on transfer theory as the main source of error. Thus, we now present another author who focuses mainly on interlanguage from an entirely phonological point of view.

In "The Phonology of Interlanguage" Elaine E. Tarone (1978) states that theories of SLA were largely focused on explaining interlanguage in terms of grammar and syntax, but the phonology of interlanguage is an area which was neglected by SLA research until very recently. There has been little interest and few studies patterns in the pronunciation of the speech of second language learners, mainly because of two reasons:

1. The learner's pronunciation of sounds of a second language was believed to be influenced more strongly by negative transfer from the first language than is the interlanguage grammar. However, the research that has been done in this area shows that transfer is only a part of the influence on interlanguage phonology.

2. Another reason is the conviction among researchers, second language teachers and students that the pronunciation of a second language is simply not very important as it is its grammar and vocabulary.

The author does not agree with either reason as she thinks that it is essential that second language learners should acquire not only the grammatical system and vocabulary of the TL, but also that they should be *intelligible* to other speakers of that language. Furthermore, she believes that more research in this field will provide much insight on our understanding of speech perception in general.

Throughout her paper, Elaine E Tarone examines the two central issues involved in current research on interlanguage phonology:

1. The nature of the processes which shape interlanguage phonology.
2. The phenomenon of fossilisation of interlanguage phonology.

Regarding the first issue, the author asserts that in the 1960's there were few papers which claimed to predict errors in the pronunciation of second language learners on the basis of a CA of the phonologies of the NL and the TL. These contrastive studies suggested that all errors in pronunciation were originated from *negative transfer*, which is the learner's attempt to use inappropriate sound patterns of the NL in place of the sound patterns of the TL. Tarone refers, then, to the valuable contributions of Johansson's studies in segmental interlanguage phonologies (1973), whose work aims at the understanding of the relative effect of transfer on interlanguage phonology, as her data indicates that language transfer does operate to shape certain aspects of the interlanguage phonology, but it operates in conjunction with other processes such as overgeneralisation and approximation. She also found that it is not enough to predict that differences between two phonological systems will create learning problems in exact proportion to the degree of difference between them. For example, in some cases, NLsounds and TL sounds which seem to be very similar are very hard to learn, whereas in other cases, NLsounds and TL

sounds which seem to be very different present no learning problems. Therefore, Johansson suggests that the difficulty in acquiring certain second language sounds may be due to the *intrinsic* difficulty of those second language sounds, which is an effect operating independent of the process of negative transfer, but interacting with it. Thus, Tarone suggests that a theory of interlanguage phonology would have to take into account the effects of the several processes which operate to shape interlanguage phonology.

Therefore, negative transfer is not the only process involved in SLA, but there are others such as *epenthesis* – vowel insertion- and the process of *avoidance,* in which physiologically difficult forms are avoided.

Concerning the fossilisation of interlanguage phonology, the author refers to the possible explanations for this process to occur.

Firstly, there is a physiological explanation which refers to the fact that when learners get old, as their muscles and nerves of the tongue and mouth have been practicing the same pronunciation habits for years, it is very difficult for them to produce new sounds, and thus to acquire native-like pronunciation. Secondly, there are some psychological explanations in which Krashen (1977) states that there is a critical period in which adolescents tend to *learn* L_2- to abstract the rules of grammar and pronunciation and apply them- rather than *acquire* L_2, which is to activate the same process children activate in order to acquire L_1. Finally, there is an affective argument which focuses on the adult learner's lack of empathy with L_2 language and speakers.

However, Tarone concludes that the causes of phonological fossilisation are not clear enough, as there is not reliable evidence to confirm these possible causes for fossilisation.

5. 2. Error Analysis.

Before 1960s, language used to be considered from a behaviouristic point of view. People learned by responding to external stimuli and receiving proper reinforcement. In this respect, when learner errors took place, they were regarded as a wrong response of those stimuli. Thus, after being made, learner errors had to be corrected immediately; on the contrary, if the error was not corrected properly, this would persist as a habit and a wrong behavioural pattern remaining in

the learner's mind. Therefore, errors had to be avoided because they might affect the process of language learning.

In language teaching, Error Analysis is a method of study focused on the types and causes of errors made by learners. EA possesses a structuralistic background, and from this its three main characteristics derive: 1) EA is taxonomic in nature; 2) EA formulates its theories about language inductively; and 3) EA focuses on the collection of data in a corpus. Consequently, Bussmann (1996) stated that errors may be classified according into:

1. Modality (i.e., level of proficiency in speaking, listening, reading, writing).

2. Linguistic levels (i.e., pronunciation, grammar, vocabulary, style).

3. Form (i.e., addition, elision, metathesis, substitution).

4. Type (i.e., systematic errors/errors in competence vs. occasional errors/errors in performance).

5. Cause (i.e., interference, interlanguage).

6. Norm vs. system.

However, the first linguist who supports the importance of errors in language learning process was S.P. Corder, who argues that language teaching should not be focused on teaching but on learning. He suggests applying new hypotheses about how languages are learned. As a matter of fact, Corder points out that when a child produces "incorrect" utterances, these errors make evident that the child is in the process of language acquisition. In Second Language Acquisition (SLA), Corder proposes that some of the strategies adopted by second language learners are basically the same as those used by first language learners. If the errors made by learners are classified, the strategies that second language learners take up could be inferred.

As a result, errors are essential due to the fact that making errors becomes a device the learners use in order to acquire a new language. By the same token, errors are thought to be caused by unconscious transfer of mother tongue structures to the system of the TL, providing thus information about both systems. Taking into account the interlanguage hypothesis of SLA, errors are indicative of the different intermediate learning levels and are useful pedagogical

feedback. In both cases, EA is a necessary methodological instrument for evaluating the language acquisition process.

To conclude, Selinker (1992) points out that the two major contributions made by Corder are that learner errors are 1) not random but systematic, and are 2) not negative but a positive factor which indicates testing hypotheses. This is how Corder begins to provide a framework for the study of language adult learners.

5. 3. Taxonomy.

Taking into account the assumptions of EA, it is necessary to specify what types of sounds present certain difficulty for Chilean Spanish speakers when learning English as a foreign language. In this respect, a sound becomes difficult for a native speaker of Chilean Spanish when:

1. A sound that occurs in the TL is not present in the learner's NL. For example, the sounds /v, θ, z/ are not present in the phonological system of Chilean Spanish, however, they are not new. Their characteristics are produced in other sounds, but what is new is their combination.

Sounds present in the TL	Sounds present in the NL
/v/: voiced, labiodental, fricative	/f/: voiceless, labiodental, fricative
/θ/: voiceless, dental, fricative	/ð/: voiced, dental, fricative
/z/: voiced, alveolar, fricative	/s/: voiceless, alveolar, fricative

2. A sound which occurs in both systems, but that is pronounced according to:

I. Degree of significance. A sound may be significant in English, but it may behave as an allophone in Spanish.

e.g. English: /ʒ/ /j/ → /tʃ/ /ʃ/
     Spanish: [ʒ] [j] → [tʃ] [ʃ]

II. Phonological context. A sound may be difficult to be pronounced depending upon its position within the utterance.

e.g. For Chilean Spanish speakers it is difficult to pronounce /h/ in initial

position, as in words such as 'house' ['xaus], ['aus], and 'his' ['çis], ['is].

3. Consonant clusters and consonant sequences are modified. The first process occurs within a word, whatever its position (initial, middle, or final), while the latter occurs in the limits or boundaries of a word.

e.g.   'mo<u>rn</u>ing'   'I've bee<u>n v</u>ery'
          /rn/ (GA)   /nv/
          [n̪n̪]   [mb]

In Spanish, speakers tend to simplify clusters, and they adopt the same strategy when producing utterances in English. In this respect, we may distinguish four main processes that are used by learners:

- Elision: it is the lack of pronunciation of a consonant or vowel sound. This phenomenon takes place in all positions, but the elision of final consonants is more frequent.

e.g. 'sale<u>s</u>man'   'sto<u>pped</u>'
        /s/   /pt/
        [ø]   [p]

- Substitution: most cases of substitution of a sound are due to the phonetic phenomenon called *assimilation*. When this process occurs, a sound is replaced because of the influence of another sound. For instance, [t̪] is often assimilated by the influence of the point of articulation belonging to the following consonant.

e.g.   'bo<u>th t</u>ake'
        /θt/
        [θt̪]

- Addition: we can distinguish two types of addition depending on where the new sound is placed.

- Paragoge: it occurs when a sound is inserted at the end of the word.

e.g. 'coming'
/ŋ/
[ŋg]

- Epenthesis: it is the insertion of one or more sound in initial or intermediate position.

e.g. 'Scotland'   'special'
/sk/   /sp/
[esk]   [esp]
[ehk]   [ehp]

- Metathesis (or transposition): it is the rearrangement of some segments. When the rearrangement is produced within the word, then we refer to *metathesis*. On the other hand, when the rearrangement occurs in the boundaries of the word, then we refer to *transposition*.

e.g. 'best'   'task'
/st/   /sk/
[ts]   [ks]

- Graphemic Interference: English spelling is not completely reliable, especially for speakers of Spanish, as in this language pronunciation is relatively orthographic. As a result of this, it is necessary to mention the main four cases that involve graphemic interference.

- A grapheme that possesses different oral realisations.

e.g. "a" → /eɪ/ as in 'take'
/æ/ as in 'back'
/ʌ/ as in 'luggage'
/aː/ as in 'park'
/ɔː/ as in 'all'

- A sound which is orthographically represented by different graphemes.

> e.g. /ʃ/ in words such as 'short', 'Chicago', 'mansion', 'commission', 'action', etc.

- A grapheme that is pronounced according to the learner's NL.

> e.g. Cognate words such as 'education', 'Egypt', 'hotel', etc.

- A grapheme which should not be pronounced due to the fact that it derives from *Historical Elision*, i.e., the sound is elided. On the other hand, a grapheme should not be pronounced when it is a result of *Contextual Elision,* i.e., the sound is elided depending on the context or situation in which the speaker is; for instance, the use of weak forms.

> e.g. H.E. → listen, Christmas, should, windmill, hour, climb, etc,
>
> C.E. → have, he, her, him, their, them, etc.

- Change of accent: Gimson makes a distinction between 'accent' and 'stress', due to its ambiguous use in linguistics and phonetics. So he regards accent as "those syllables which stand out above others, either in individual words or in longer utterances" (Gimson, 2001: 25). Unlike Spanish, the accentual pattern in English is said to be 'fixed', i.e. in most cases, the main accent will fall on the same syllable, which is a source of confusion for native speakers of Spanish, who will always tend to emphasize the penultimate syllable, especially when the word ends in <n>, <s> or vowel.

> e.g. 'tourism' → [t̪ueˈrisom]
>
> 'television' → [t̪eleˈβitʃon̪]

5. 4. Contrastive Analysis.

Contrastive Analysis is an inductive investigative approach in which two languages are systematically compared. In the field of SLA, its aim is to identify points of similarity and difference between Native Languages and Target Languages. Thus, CA will, by means of comparing the sound systems of both languages, predict which specific sounds present in the TL would be most difficult for second language learners to acquire.

Regarding Second Language Teaching (SLT), it was thought that teaching could become more effective when taking into consideration both NL and TL. Hence, teaching materials could be more efficient if the language to be learned were described and compared to the NL of the learner.

At the same time, Robert Lado expresses the importance of CA in language teaching material design by arguing that learners tend to transfer the forms and meanings –and their distribution as well- from their mother tongue to the foreign language. Furthermore, he goes on to state that "those elements that are similar to his native language will be simple for him, and those elements that are different will be difficult." (Lado 1957:2). Consequently, linguistic differences could be used to predict learner errors, aspect that would lead to the Contrastive Analysis Hypothesis (CAH).

The theoretical foundations for what becomes known the CAH is formulated in Lado's *Linguistics Across Cultures* (1957). In his book, Lado is the first to provide a comprehensive theoretical treatment and to suggest a systematic set of technical procedures for the contrastive study of languages. This involves describing languages by using Structuralist Linguistics, comparing them and predicting learner difficulties. Depending upon the similarities and/or differences found in both languages compared, it could be stated that "where two languages were similar, positive transfer would occur; where they were different, negative transfer, or interference, would result". (Larsen-Freeman & Long 1991:53). It is necessary to mention that, on the one hand, *negative transfer* corresponds to the learner's attempt to use inappropriate sound patterns of the NL in place of the TL. On the other hand, *positive transfer* occurs when both the NL and TL have the same or almost the same phonological features.

5. 5. The psycho-phonemic and physio-phonetic stages in the teaching of pronunciation.

The teaching of pronunciation has been, in many ways, neglected today due to the primacy given to effective communication; and consequently, there is a great number of learners of English that disregard pronunciation, because their main goal is to be understood and not to produce sounds similar to the ones uttered by a speaker of English, belonging to the sound system of English.

Nevertheless, the communicative competence requires, among other conditions, the intelligibility in everyday messages and a good performance; a fact that proves the importance of teaching some aspects belonging to the area of phonetics and phonology.

According to Hiram Vivanco (*Some Considerations on Phonological Theory and the Teaching of Pronunciation*, 2001) there are two stages that "classify and explain some pronunciation errors" (Vivanco, H. 2001:8), the psycho-phonemic and the physio-phonetic. The first one is related to the knowledge that one person has on "the acoustic image, the sound image or the internal representation of... [a] word" (Vivanco, H. 2001:8) when pronouncing it. On the other hand, the second stage is concerned with the "physiological movements required to utter a certain sequence of sounds, to the actual articulation of the phones" (Vivanco, H. 2001:8), which is also stated as to have a good pronunciation.

To illustrate this, we could set as an example the case of a Chilean speaker pronouncing the word <behave>, which is pronounced /bɪˈheɪv/. In this situation, the person would probably say [biˈçeiß], which can be classified as a phsysio-phonetic problem, since the person has the correct acoustic image in mind, but he or she cannot articulate correctly the English sounds.

On the other hand, if the same or other Chilean speaker says [beˈhave], he or she will be aiming at a psycho-phonemic problem, which is associated to the lack of the acoustic image in the production of any utterance, in this case, in a word; although he or she seems to master "the sound system of English at the phonic level" (Vivanco, H. 2001:8).

However, it is important to mention as well that for these problems there are some possible solutions. The first problem at the physio-phonetic stage presents some difficulty when trying to fix it, since this person should exercise and repeat the segment many times until he or she had modified "(…) some of his [or her] articulatory habits" (Vivanco, H. 2001:8), a fact that could be complex for a Chilean speaker due to the lack of some English sounds in the Chilean-Spanish phonological system and to the distribution of some sounds in it.

In the first place, we do not count with the voiced, labio-dental, fricative sound /**v**/, so it tends to be replaced by a voiced, bilabial, fricative [ß], since it follows a vowel sound -according to the complementary distribution this sound responds to. Also, /**v**/ in final position could be replaced by [ø] by a Chilean-Spanish speaker, since we tend to omit sounds when placed in last position. Moreover, the voiceless, glottal, fricative sound /ŋ/ presents some problems as well, since according to its complementary distribution[2] in our phonological system, this never precedes a vowel sound; and, subsequently, it is replaced by a sound voiceless, palatal, fricative [ç], allophone[3] of the voiceless, velar, fricative sound [x], since it precedes a frontal vowel sound.

The second problem at the psycho-phonemic stage presents a different solution: as we know, the speaker produces the appropriate English sounds; however, he or she does not possess the correct acoustic image of the word. Therefore, it is useful to apply the phonetic transcription system or *phonetic language* (Vivanco, H. 2001), in which the pronunciation of the word is presented as if they were graphemes. Consequently, a word like <behave> is showed as "bihéiv"; and, in that way, the mistaken sound image is repaired.

These cases have not shown a problem of accentuation, since they are the easiest cases to be solved when dealing with phonological problems, thus this should be replaced or repositioned.

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[2] "Submembers of a phoneme which are mutually exclusive in their distribution so that the total of the distributions of each submember make up the total distributionof the phoneme as a whole" (Pike 1947:235)

[3] "(Allophones are) variants of the same phoneme occurring in different words or in different positions in a word". (Cruttenden 1994:44)

As a conclusion, it is important to mention that, although it is relevant to communicate quickly and effectively nowadays, we cannot forget that clear and correct sounds are fundamental when decoding messages in oral communication and, also, not to misunderstand ideas and basic utterances, such as the difference between <they> /ðeɪ/ and <day> /deɪ/, which could be pronounced alternatively by a Chilean speaker, causing confusion; reason why it seems imperative to centre the attention not only on grammar, as it has long been so, but also on phonology, through the teaching of pronunciation when teaching English at any level.

6. Investigation.

6. 1. The importance of new technology for English edutainment in schools and the participation of the seminar group in the project.

In the last decades, the introduction of new technology in the teaching of English as a foreign language has become very significant. However, we cannot simply apply it without restrictions. It is necessary to evaluate it and determine to what extent it may really be an important contribution to the pedagogical objectives.

Some months ago, the Faculty of Mathematics and Physics Sciences of the University of Chile, specifically, the Department of Electrical Engineering; started the elaboration of a new software that would help teachers of English as a foreign language in their classes in the last years of primary level in public schools. For them, the most important fact that they tried to prove was that students felt more comfortable using the software in the computer than interacting in front of a teacher and their classmates.

In order to carry out this part of the project, we were asked to fulfil some important tasks: first, to provide the linguistic input to be used in designing the software and second, to perform the role of teachers of an 8th grade class to see the way these children interacted with a teacher and contrast this behaviour with their performance using the software that the engineers had prepared.

The participation of the seminar group in the project is relevant, since we have knowledge of linguistics, particularly, in some areas of applied linguistics such as EA, and of the English language, specifically English phonetics and phonology.

It can be stated that, in general, many computational programmes have been created to help teachers in the teaching of English; however, they are mainly concerned with vocabulary and grammar, leaving pronunciation out. For this reason, the software that has been developed by our co-researchers is centred on the pronunciation of segments and on intonation.

On the basis of the information provided by us, the software is devised so that it can evaluate the pronunciation of the students assigning a grade from 1 to 5. The highest grade indicates a pronunciation that approximates the target.

6. 2. Description of the different tasks we carried out.
6. 2. 1. Task 1.

The first important task was related to provide linguistic material to the engineers, so that they elaborate the software to be used pedagogically.

In the first place, we elaborated lists of words which included most of the English phonemes in different contexts. These words had to be fairly common and, as far as possible, known by elementary students. For practical reasons we limited the number of words to 25. (See Appendix).

The next step was to predict the errors Chilean students might produce when pronouncing these utterances. Thus, deviant forms were created and assigned a grade considering how close they were to the target. Score 5 is assigned to the target pronunciation. The following is an example of the word 'thirty-two' with its correct (target) pronunciation and various deviant forms with scores assigned according to their estimated distance from the target:

	TARGET	DEVIANT FORMS			
word	**Score 5**	**Score 4**	**Score 3**	**Score 2**	**Score 1**
thirty-two	[ˈθɜːtɪ ˈtʰuː]	[ˈsɛrt̪i ˈt̪u] [ˈθirt̪i ˈt̪u]	[ˈsirt̪i ˈt̪u] [ˈt̪ert̪i ˈt̪u]	[ˈt̪irt̪i ˈt̪u]	[ˈt̪irt̪i ˈt̪uo]

6. 2. 2. Task 2.

The group of engineers delivered a number of samples that were recorded by the group of non-native speakers of English and/or non-experts on English Linguistics, in order to be evaluated by our seminar group.

The main goal was to score them from 1 to 5, so that the computers could identify, through specialized technology, the similarities in the different types of mistakes and why these deviate from the correct form.

The diverse analyses consisted on the division of a total number of samples into 10 subgroups, since the group of seminar was first constituted by 10 members. The first 590 samples were analysed by subgroups, that is to say, the 590 samples were divided into ten, but each group of ten was analysed by 3 different people, with the purpose of giving an impartial judgment of them. The other subsequent samples were divided again, but, this time, these were analysed by two people each group of samples. Each one received a chart to evaluate and write down the scores. This shows how the first task was carried out:

Signal / Judge	91-144	145-191	192-239	240-293	294-341	342-389	390-439	440-490	491-540	541-590
Adaros, Javiera	judge 1								judge 3	judge 2
Gajardo, Consuelo	judge 2	judge 1								judge 3
Galaz, Ximena	judge 3	judge 2	judge 1							
Herrera, Macarena		judge 3	judge 2	judge 1						
Morales, Francisca			judge 3	judge 2	judge 1					
Morales, Jeannette				judge 3	judge 2	judge 1				
Moya, María Paz					judge 3	judge 2	judge 1			
Sánchez, Daniela						judge 3	judge 2	judge 1		
Sánchez, Marianne							judge 3	judge 2	judge 1	
Ubilla, Daniela								judge 3	judge 2	judge 1

The organisation of all this considered: the name of the signal, the word to be evaluated, and the correspondent grade.

Name of the Signal	Word to be evaluated	Score Judge 1	Score Judge 2	Score Judge 3	Average
T91.wav	far				
T92.wav	far				
T93.wav	far				
T94.wav	far				
T95.wav	far				
T96.wav	far				
T97.wav	healthy				
……..	…….				

When this process was finished, the group gathered to discuss the results and give their own scores to get an average. The scores ranged from 1 to 2 points of difference, and, if the score of a word had more than 2 points of difference in relation to the scores given individually, the whole group would listen to the signal and evaluate it again together coming to an agreement on just one score to represent the average. Finally, we elaborated a final report on the whole process and sent it to the engineers.

Being based on the different authors' ideas presented in the theoretical framework, we applied the diverse criteria when analysing the samples. The samples presented words, phrases and/or sentences, a fact that elucidates the first type of categorisation that these should be given. However, we only took words into account.

To be more precise, we will be displaying the criteria used when classifying the samples, the score they obtained, the correspondent transcription of the correct form, the deviant forms of the same, and the explanation and analysis of these.

The first categorisation the samples received was related to the number of syllables each word had. In this, we could find monosyllables, disyllables, trisyllables, and polysyllables. This first classification is rather important in terms of evaluation, since it is noticeable that simple words, such as monosyllables, may present less possibilities of having a great number of mistakes in pronunciation; and, for the same reason, less possibilities of fitting into the potential scores. In

fact, in the case of monosyllables, if there is a change in the vowel sound, a monosyllable word will probably attain a 1 as score, not even going through 4, 3, or 2.

Instead, in a typical long-syllable word we could find more mistakes in pronunciation, because they present a more complex environment due to their length, by which these kinds of samples have more possibilities of obtaining scores from 1 to 4. In general terms, this classification was not crucial when evaluating, but rather to organise the words.

A second classification is based on the production of consonant and vowel sounds. Although the first ones are considered as more relevant than the second ones when evaluating the samples, vowel sounds are important when their quality is modified, changing the whole word's sense as in the case of <burst> in which the pronunciation [ßurs̱t̪] changes its meaning. But this is not the case of words like <example>, in which a pronunciation like [ikˈsampl̩] does not affect it that much. Intelligibility was also taken into account, i.e. the word could not be understood clearly.

The third taxonomy is concerned with the placement of the accent in each word. Again, we noticed the difference when having monosyllable and polysyllable words. This last group could be deviant in terms of accentuation, since it presented a larger number of syllables that could be emphasised; however in the first one, this is not relevant due to its monosyllabic quality, making it impossible to change the placement of the accent. To set an example, these two opposite cases: <burst> - /bɜːst/ and <thirty-two> - /ˈθɜːtɪ ˈtuː/, which could be also mispronounced, replaced by [ˈθɜːt̪ɪ t̪ʰuː] and [θɜːt̪ɪ ˈt̪ʰuː].

Lastly, the level of intelligibility of the whole utterance is important. This is not precisely related to the exact pronunciation -although it has a connection with vowel and consonant sounds, as mentioned before-, but with the level of understanding that a speaker of English or our seminar group, as English linguists, can obtain from the pronunciation of any utterance produced by a non-speaker of English; therefore, the sounds were taken as a whole and then evaluated.

For this reason, the second and last categorisations were predominant when analysing the samples. The first one was established only to separate words, but not in any case affected the score that the words received.

We will display the different words that were chosen from the samples we proposed, which represent some good examples of what we have explained here, taking all the former considerations into account:

Against	Chocolate	Hospital	Special	Tourism
Behave	Doesn't	Mouth	Student	Vegetable
Boyfriend	Example	Ringing	Television	Vibration
Burst	George	Scientist	Thirty-Two	Wouldn't
College	Handsome	Should	Thousand	Yesterday

These twenty-five words were recorded by our guide teacher and us (both target and deviant forms); so that they could be used by the computing programme as signals against which the pronunciation of its users could be compared. The software should be capable of assigning a grade based on this matching operation.

These words were also recorded by speakers of Chilean Spanish without any special training in English, who were actually the subjects of investigation. The obtained pronunciations were compared with the predicted errors -so as to check the adequacy of our predictions- and graded by the members of our group.

As we had foreseen, these speakers produced forms that we had not predicted. This way, we were able to enlarge the set of deviant realisations. In fact, the larger the number of deviant items the better, as the software must be able to cope with many different pronunciations.

6. 2. 3. Task 3.

It was also necessary to judge whether the word pronounced by the members of the seminar were closer to a General American or an RP pronunciation, since, for practical purposes, the software had to consider one accent consistently.

6. 2. 4. Task 4.

The forth task involved 14 students from a public school.

Four members of the seminar gave an English lesson to 7 of these students, performing activities such as reading a text, answering some questions about it, matching words with their meanings and, finally, practicing pronunciation. Each student had to pronounce a set of words and phrases as a group and then individually.

While we were performing this activity, the other group of 7 students was working at the computer lab using the software performing tasks that were similar to the ones carried out by the first group and us.

The purpose of these activities was to determine the degree of participation of each student and to see whether they were more confident with a teacher or with the software.

We were engaged in other activities concerning our participation in the software elaboration, but we decided to leave them aside as they were not directly concerned with our investigation.

6. 3. The Chart.

The chart we present here shows all the pronunciations we got from the twenty-five words we chose to represent the total amount of consonant sounds in English. At the same time, we scored the different realisations of the words to help clarify how distant they were from the target pronunciation and how much this would affect the intelligibility of a word. Finally, we wanted to specify the processes involved in the realisations of the words in order to explain what happened when the speakers attempted to pronounce a word in English, i.e. how their interlanguage would work. For this purpose we considered only six processes: substitution, elision, addition, metathesis, graphemic interference, and change of accent.

At the beginning of the investigation we created a list which contained the twenty-five words mentioned above and, following the theory on EA, we added the possible pronunciations of every word, focusing on the realisations that were most likely to occur in a Chilean Spanish

environment. Afterwards, we assigned a score from 1 to 5 to each of them, where 5 represented the target pronunciation and 1 the most deviant one, as shown in Table 1:

PALABRA		handsome		PALABRA		thirty-two
PRONUNCIACIÓN CORRECTA	5.	[ˈhæn(d)səm]		PRONUNCIACIÓN CORRECTA	5.	[ˈθɜːti ˈtuː]
PRONUNCIACIONES	4.	[ˈhansom] [ˈxansom]		PRONUNCIACIONES	4.	[ˈserti̞ ˈtu] [ˈθir̞ti̞ ˈtu]
DESVIADAS	3.	[ˈxanson] [ˈhansome]		DESVIADAS	3.	[ˈsir̞ti̞ ˈtu] [ˈter̞ti̞ ˈtu]
	2.	[hanˈsome] [xanˈsome]			2.	[ˈt̞ir̞ti̞ ˈtu]
	1.	[ˈansom] [anˈsome]			1.	[ˈt̞ir̞ti̞ ˈtuo]
FONEMAS INCLUIDOS:				FONEMAS INCLUIDOS:		
/h/ inicial y prevocálica				/θ/ inicial y prevocálica		
/n/ antes de /s/				/t/ intervocálica		
/s/ después de /n/				vocales /ɜː/ /ɪ/ /ɪuː/		
/m/ final						
vocales /æ/ /ə/						
PALABRA		boyfriend		PALABRA		tourism
PRONUNCIACIÓN CORRECTA	5.	[ˈbɔɪfrenḍ]		PRONUNCIACIÓN CORRECTA	5.	[ˈtʊərɪsm]
PRONUNCIACIONES	4.	[ˈβoifrenḍ]		PRONUNCIACIONES	4.	[ˈt̞urism] [ˈt̞urisem]
DESVIADAS	3.	[ˈboifren][ˈboifrien]		DESVIADAS	3.	[ˈt̞urisn] [ˈt̞urisen]
	2.	[ˈβoifrienḍ] [ˈβoifren]			2.	[t̞uˈrism] [t̞uˈrisn]
	1.	[ˈβoifrien]			1.	[t̞uˈrisem] [t̞uˈrisen] [t̞uˈrisom]
FONEMAS INCLUIDOS:				FONEMAS INCLUIDOS:		
/b/ inicial y prevocálica				/t/ inicial y prevocálica		
/f/ antes de /r/				/r/ intervocálica		
/r/ postconsonántica				/s/ antes de /m/		
/n/ antes de /d/ final				/m/ final después de /s/		
/d/ después de /n/				vocales /ʊə/ /ɪ/		
vocales /ɔɪ/ /e/						

Table 1. Reference document with the possible deviant pronunciations of certain words in English.

Later, each of us graded the different pronunciations of one informant and after that, we put all of them together in a chart and organised them randomly to avoid any preconceived idea of how to grade them after they had been recorded by the informants; if not, the first pronunciations of every word would have been the most deviant ones and the last two, the best samples. In the previous stage, when each of us graded one informant's realisations, we noticed that there were forms that greatly differed from each other within the same chart (i.e. within the same informant). Later on, we were told that half of the samples were uttered after having heard the input and the other half, without having heard the input.

Once we had the results in the chart, we compared them with the predicted errors we had and found that only a few of them were present; in most cases, there were two or three of them and all the others realisations were "new" to us, as shown in Table 2.

Word	Transcription	Score JA	Score CG	Score XG	Score MH	Score JM	Score PM	Score DS	Score MS	Score DU	Average	Process Involved
tourism	[ˈtou̯risom]											
	[tue̯ˈrisom]											
	[ˈtue̯risom]											
	[ˈtou̯ris]											
	[ˈtoris]											
	[ˈturisim]											
	[ˈturisims]											
	[ˈtʰuarism̩]											
	[tu̯ˈrims]											
	[ˈtʰuəɹism̩]											
	[ˈtʰuːɹism̩]											
	[ˈtou̯ɹism̩]											
	[ˈtu̯ɹism̩]											
	[ˈtoːrism̩]											
	[ˈtorism̩]											
	[ˈtourisem]											
	[ˈturis]											
	[tu̯ˈaɹism̩]											
	[ˈturisəm]											
	[tu̯ˈris]											
	[ty̯ˈris]											
	[ˈturisom]											
	[ˈtou̯ɹism̩]											
	[ˈtou̯ɹisum]											
	[ˈtousim]											

Table 2. Chart with all the informants' realisations of the word "tourism".

Each one of us graded the words separately and then, only one of us put them together and calculated the average score per realisation. The scores were given in order to corroborate the criteria we had agreed on. Thus, we were able to get a better understanding of the *real* hierarchy of errors in our corpus, so that we could complement the Reference Document we had before as the *ideal* hierarchy of errors.

It is important to consider, though, that variables such as knowledge of a third language and the amount of years the speaker was exposed to the TL at school may alter the performance of the speakers. In the first case, one of the speakers was fluent in French and this language interfered with the sounds she could not pronounce in English, uttering forms such as [ꞵeʒy̯ta̯ˈꞵl] and [t̯uˈrys]. In the second case, the speaker had English classes until fifth grade and then stopped learning the language, so he pronounced [bur̯t̯] instead of [bɝst̯], and [ˈðoʊnse] instead of [ˈdʌzə̯nt̯].

6. 4. Phonological Processes.

In this part of our investigation, the total number of processes we found in the whole number of samples recorded by the group of Chilean speakers from Santiago will be shown. These processes are: Addition, Elision, Metathesis, Substitution, Graphemic Interference, and, we also took into account Change of accent as a relevant process when referring to phonological errors made by the speakers.

Number of processes involved

	Value
Addition	236
Elision	136
Metathesis	24
Substitution	894
Graphemic Interference	30
Change of Stress	31

Process

Percentage of processes involved
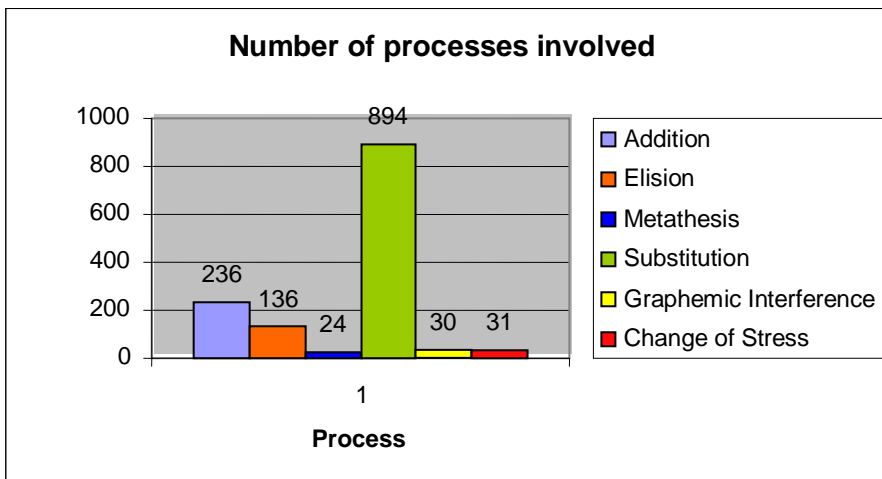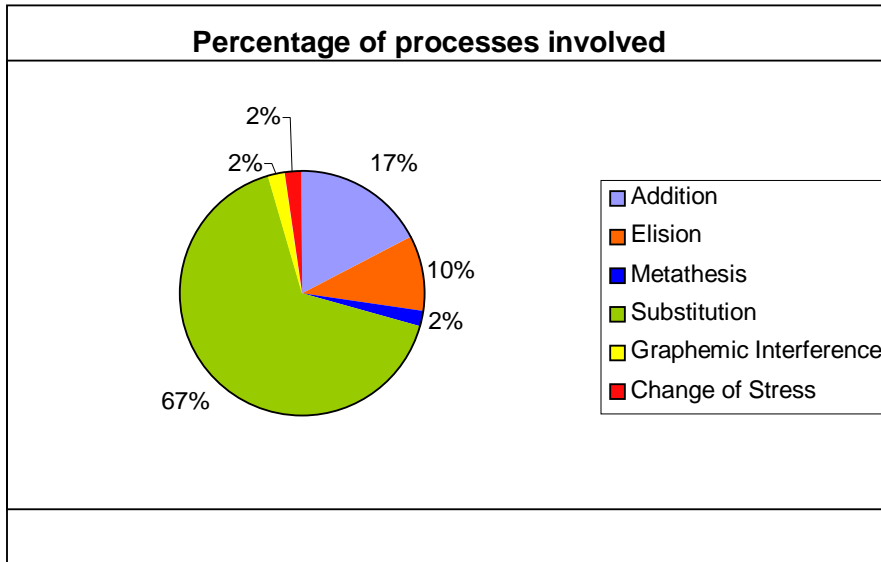
6. 4. 1. Processes per word, their appearance, and corresponding percentage regarding the process itself and the total number.

SCIENTIST

PROCESS	N°	%
Addition	0	0
Elision	14	10.3
Metathesis	3	12.5
Substitution	53	5.9
Graphemic Interference	3	10
Change of accent	0	0

STUDENT

PROCESS	N°	%
Addition	15	6.4
Elision	8	5.9
Metathesis	2	8.3
Substitution	35	3.9
Graphemic Interference	0	0
Change of accent	0	0

THOUSAND

PROCESS	N°	%
Addition	1	0.4
Elision	18	13.2
Metathesis	2	8.3
Substitution	73	8.2
Graphemic Interference	0	0
Change of accent	3	9.7

SHOULD

PROCESS	N°	%
Addition	13	5.5
Elision	2	1.5
Metathesis	0	0
Substitution	28	3.1
Graphemic Interference	3	10
Change of accent	0	0

SPECIAL

PROCESS	N°	%
Addition	22	9.3
Elision	0	0
Metathesis	0	0
Substitution	5	0.6
Graphemic Interference	1	3.3
Change of accent	0	0

DOESN'T

PROCESS	N°	%
Addition	24	10.2
Elision	5	3.7
Metathesis	4	16.7
Substitution	59	6.6
Graphemic Interference	0	0
Change of accent	1	3.2

VEGETABLE

PROCESS	N°	%
Addition	14	5.9
Elision	4	2.9
Metathesis	0	0
Substitution	78	8.7
Graphemic Interference	4	13.3
Change of accent	3	9.7

GEORGE

PROCESS	N°	%
Addition	2	0.8
Elision	4	2.9
Metathesis	0	0
Substitution	31	3.5
Graphemic Interference	0	0
Change of accent	0	0

CHOCOLATE

PROCESS	N°	%
Addition	21	8.9
Elision	5	3.7
Metathesis	0	0
Substitution	20	2.2
Graphemic Interference	0	0
Change of accent	1	3.2

TELEVISION

PROCESS	N°	%
Addition	14	5.9
Elision	0	0
Metathesis	0	0
Substitution	44	4.9
Graphemic Interference	0	0
Change of accent	5	16.1

VIBRATION

PROCESS	N°	%
Addition	10	4.2
Elision	7	5.1
Metathesis	1	4.2
Substitution	38	4.3
Graphemic Interference	1	3.3
Change of accent	0	0

HOSPITAL

PROCESS	N°	%
Addition	7	3
Elision	1	0.7
Metathesis	0	0
Substitution	15	1.7
Graphemic Interference	0	0
Change of accent	0	0

BURST

PROCESS	N°	%
Addition	1	0.4
Elision	6	4.4
Metathesis	6	25
Substitution	38	4.3
Graphemic Interference	2	6.7
Change of accent	0	0

YESTERDAY

PROCESS	N°	%
Addition	0	0
Elision	2	1.5
Metathesis	0	0
Substitution	37	4.1
Graphemic Interference	3	10
Change of accent	0	0

BEHAVE

PROCESS	N°	%
Addition	0	0
Elision	0	0
Metathesis	0	0
Substitution	43	4.8
Graphemic Interference	1	3.3
Change of accent	2	6.5

MOUTH

PROCESS	N°	%
Addition	3	1.3
Elision	1	0.7
Metathesis	0	0
Substitution	20	2.2
Graphemic Interference	1	3.3
Change of accent	0	0

WOULDN'T

PROCESS	N°	%
Addition	42	17.8
Elision	5	3.7
Metathesis	0	0
Substitution	49	5.5
Graphemic Interference	8	26.7
Change of accent	2	6.5

COLLEGE

PROCESS	N°	%
Addition	0	0
Elision	1	0.7
Metathesis	0	0
Substitution	16	1.8
Graphemic Interference	0	0
Change of accent	0	0

EXAMPLE

PROCESS	N°	%
Addition	5	2.1
Elision	2	1.5
Metathesis	0	0
Substitution	49	5.5
Graphemic Interference	0	0
Change of accent	0	0

AGAINST

PROCESS	N°	%
Addition	5	2.1
Elision	21	15.4
Metathesis	4	16.7
Substitution	34	3.8
Graphemic Interference	0	0
Change of accent	0	0

HANDSOME

PROCESS	N°	%
Addition	7	3
Elision	3	2.2
Metathesis	0	0
Substitution	14	1.6
Graphemic Interference	0	0
Change of accent	0	0

BOYFRIEND

PROCESS	N°	%
Addition	12	5.1
Elision	11	8.1
Metathesis	0	0
Substitution	20	2.2
Graphemic Interference	0	0
Change of accent	0	0

THIRTY-TWO

PROCESS	N°	%
Addition	0	0
Elision	0	0
Metathesis	0	0
Substitution	58	6.5
Graphemic Interference	0	0
Change of accent	10	32.3

TOURISM

PROCESS	N°	%
Addition	8	3.4
Elision	14	10.3
Metathesis	2	8.3
Substitution	30	3.4
Graphemic Interference	3	10
Change of accent	4	12.9

RINGING

PROCESS	N°	%
Addition	10	4.2
Elision	2	1.5
Metathesis	0	0
Substitution	7	0.8
Graphemic Interference	0	0
Change of accent	0	0

6. 4. 2. Discussion of the results.

- Among 25 words, 20 presented addition; 20 elision; 8 metathesis, 25 substitution; 11 graphemic interference; 9 change of accent.

- The word that presents the highest number of additions is "wouldn't", with 42 of them, which can be explained by the complex environment that this word presents in the last syllable, composed only by consonants; a fact that differs from our Chilean grammatical system, in which the words do not present 3 consonant

sounds in the same syllable. Therefore, a Chilean speaker tends to adequate this situation to their mother tongue by adding more vowel sounds.

- The word that shows the highest number of elisions is "against", with 21 of them, which, again, presents a complex environment, this being the reason why the person tends to elide one of the consonant sounds alternatively.

- The word that shows the highest number of metatheses is "burst" with only 6. Although this is not a high number, we find again a difficult environment in which sounds could be interchanged due to the difficulty that they present being all together, causing the process.

- "Vegetable" is the word that shows the highest number of substitution with a total number of 78. This situation can be explained by the high number of sounds that can be replaced by a Chilean speaker with a basic level of English. In our phonological system, we have a greater number of sounds that are allophones at our disposal, whereas the same sounds are phonemes in English, this being the reason why this speaker has no restriction when replacing the sounds.

- The word that presents the highest number of graphemic interference is "wouldn't" with 8 of them, which could be probably explained by the orthographic presence of <l>, dropped due to different processes that this word suffered through history.

- The word that presents the highest number of change of accent is "thirty-two" with 10. This can be explained due to the compound nature of this word, a fact that seems to affect the placement of the stress, since it is not only a simple word; but, technically, a disyllable word and a monosyllable one together.

- The most common process is Substitution with 894 appearances in the total number of words -25- , following Addition with 236 appearances in 20 words, and Elision with 136 appearances in 20 words. These three processes are the most important ones and the most used elements when mending the complex environment that English words present to Chilean-Spanish speakers from Santiago.

6.5. Corpus Analysis.

6. 5. 1. Figures: Predictability vs. Occurrence.

In order to give a better understanding of our investigation in relation to the twenty-five words we worked with, we decided to make an exposure of it by means of figures, which include the numeric information in tables, and the statistical data through pie charts.

We elaborated two types of graphs. Both of them display the percentage of predicted deviant forms that occurred and the percentage of predicted deviant forms that did not; that is to say, non-predicted forms or new forms. For instance, we created eight possible deviant pronunciations of the word "Against", but, after the careful transcription of the data, we realised that only two forms (6%), from a total of thirty-one uttered forms, actually happened; which means that twenty-nine forms (94%) were new to us and six (75%) out of the eight we predicted were not used by any informant.

Now, we present the tables containing the figures of each of the twenty-five words we analysed, with the detailed information we explained above –*Non-predicted forms*, *Predicted forms that occurred*, *Predicted forms that did not occur*- and the charts for each one of them.

Table 3.

Word	Non-predicted forms elicited from the subjects	Predicted forms that occurred	Total uttered forms
Against	29	2	31
Behave	13	2	15
Boyfriend	19	2	21
Burst	19	2	21
College	2	6	8
Chocolate	12	4	16
Doesn't	15	1	16
Example	13	3	16
George	13	3	16
Handsome	11	1	12
Hospital	5	4	9
Mouth	11	5	16
Ringing	4	5	9
Scientist	18	3	21
Should	18	5	23
Special	6	7	13
Student	23	3	26
Television	18	2	20
Thirty-two	21	2	23
Thousand	25	4	29
Tourism	24	1	25
Vegetable	29	1	30
Vibration	19	1	20
Wouldn't	27	3	30
Yesterday	21	0	21

Table 4.

Word	Predicted forms that did not occur	Predicted forms that occurred	Total number of predictions
Against	6	2	8
Behave	7	2	9
Boyfriend	5	2	7
Burst	7	2	9
College	3	6	9
Chocolate	3	4	7
Doesn't	9	1	10
Example	7	3	10
George	8	3	11
Handsome	8	1	9
Hospital	5	4	9
Mouth	3	5	8
Ringing	0	5	5
Scientist	8	3	11
Should	4	5	9
Special	3	7	10
Student	5	3	8
Television	6	2	8
Thirty-two	5	2	7
Thousand	3	4	7
Tourism	9	1	10
Vegetable	8	1	9
Vibration	6	1	7
Wouldn't	6	3	9
Yesterday	9	0	9

6. 5. 2. Statistical Information.

The charts on the left represent the information given in Table 4, while the charts on the
right represent the information displayed on Table 3.

Legend

■ Predicted Forms that did not occur
■ Predicted Forms that occurred
■ Non-predicted Forms elicited from the subjects
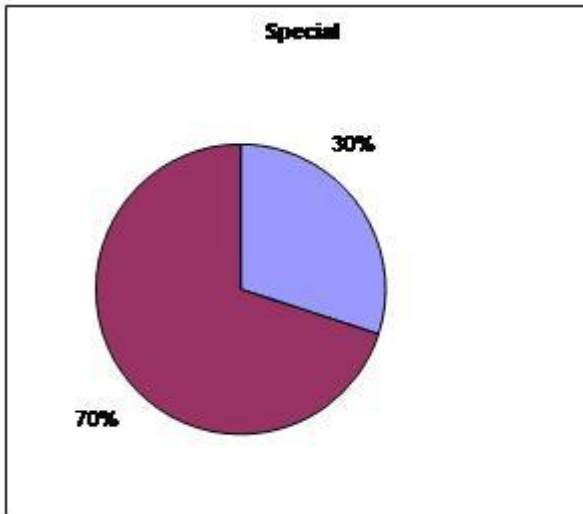□ Predicted Forms that occurred

Boyfriend

29%

71%

Boyfriend

10%

90%

Burst

22%

78%

Burst

10%

90%

Chocolate

43%

57%

Chocolate

29%

75%

College

33%

67%

College

25%

75%

Doesn't

10%

90%

Doesn't

6%

94%

Example

30%

70%

Example

19%

81%

George
27%
73%

George
19%
81%

Handsome
11%
89%

Handsome
8%
92%

Hospital
44%
56%

Hospital
44%
56%

Mouth

37%

63%

Mouth

31%

69%

Ringing

0%

100%

Ringing

44%

56%

Scientist

27%

73%

Scientist

14%

86%

55

Should

44%

56%

Should

22%

78%

Special

30%

70%

Special

46%

54%

Student

38%

62%

Student

12%

88%

Television

Television

Thirty-two

Thirty-two

Thousand

Thousand

Tourism

10%

90%

Tourism

4%

96%

Vegetable

11%

89%

Vegetable

3%

97%

Vibration

14%

86%

Vibration
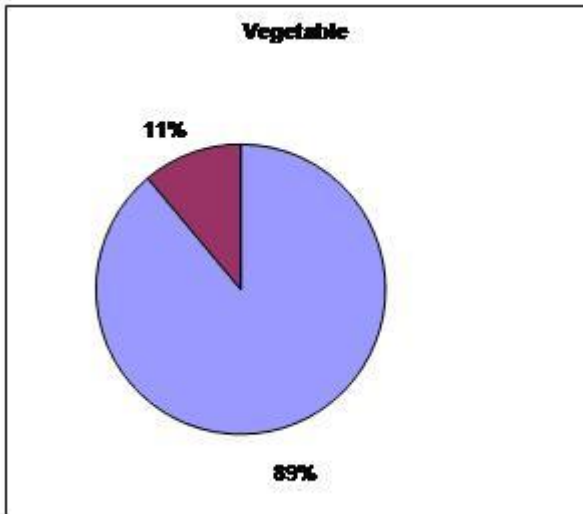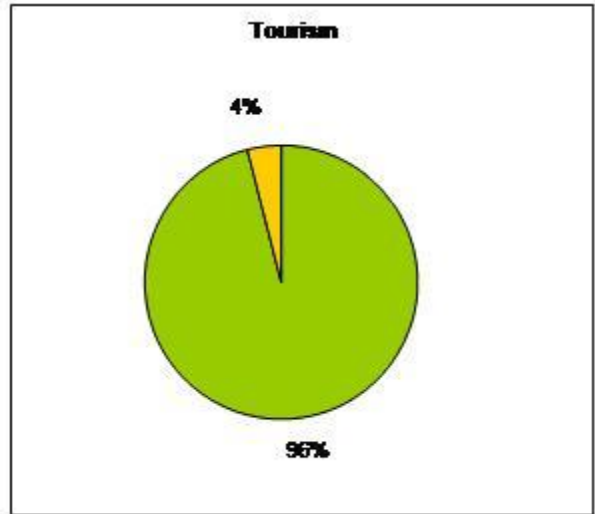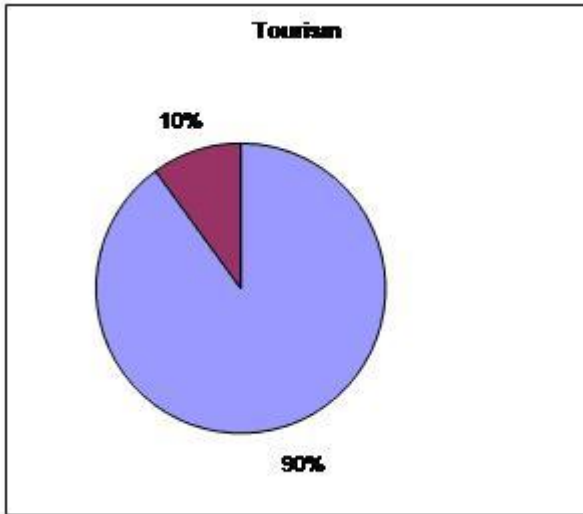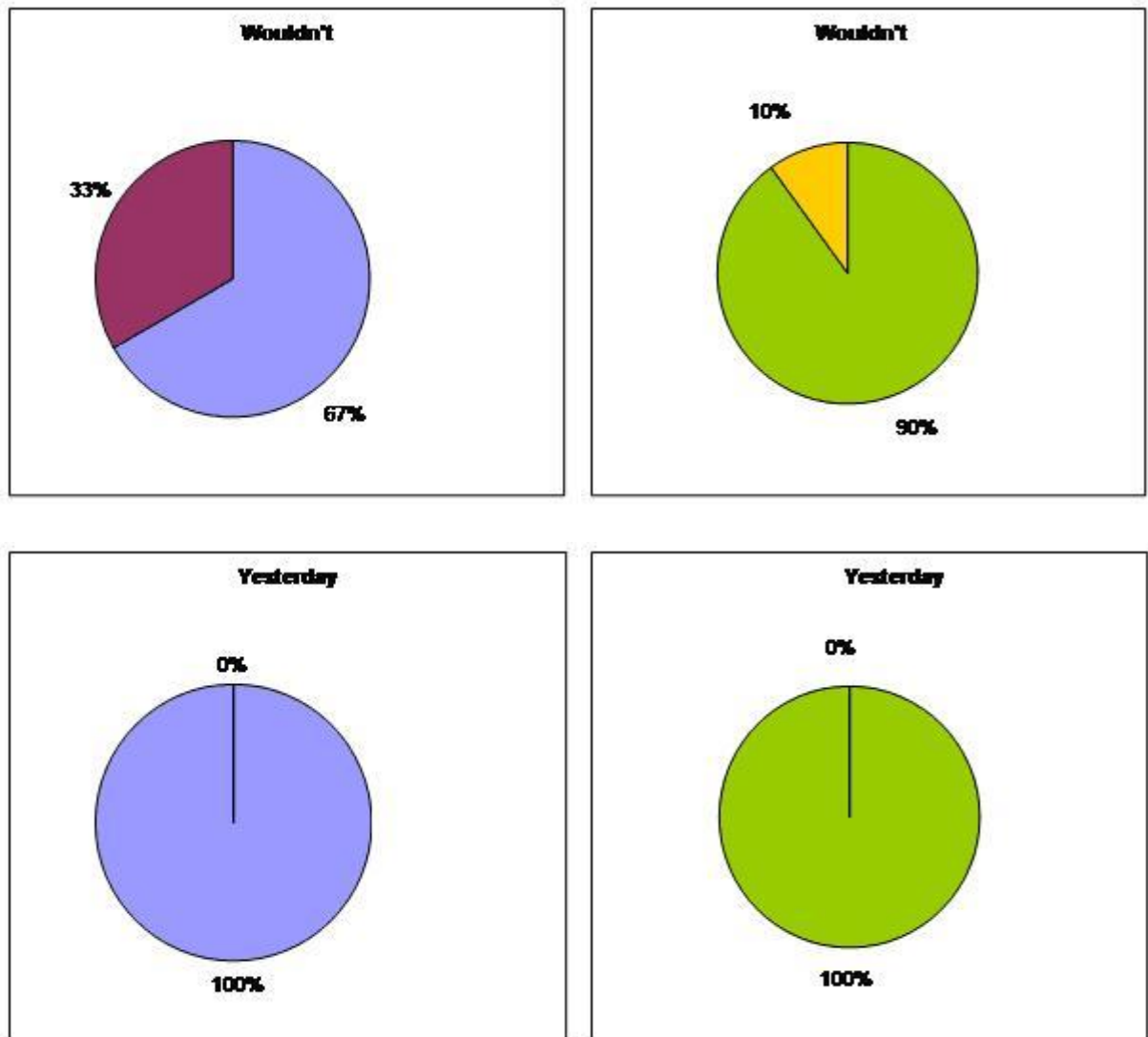
5%

95%

6. 5. 3. Notes on the Figures.

The analysis of the results derived from the data showed two extreme cases of predictability vs. occurrence. On the one hand, the predicted pronunciations of the word "ringing" matched the total number of its uttered forms.

On the other hand, the word "yesterday" presented no matching instances between the two factors mentioned above.

7. Conclusions.

7. 1. Theoretical Framework

7. 1. 1. Error Analysis

Corder asserted that there are acquisitions patterns that all second language learners tend to repeat. In this respect, error analysis methodology is of great utility in the predictions of their errors, which are supposed to be realised in a similar manner. Furthermore, he claims that there are rules established by EA which can be applied to every idiosyncratic dialect. According to this, as our experiment was composed by randomly chosen subjects who were not supposed to have specific training in English, they are not proper "L2 Learners", and consequently, it is not possible to study every case. However, this empirical decision allowed us to obtain a wider sample of possible errors since the software would be used by beginners in the language.

Regarding Error Analysis, this approach becomes deficient when reporting linguistic competence of the subjects, in the sense that it does not provide an account of what they know about the language, showing a limited part of the control the learners have on their second language. Thus, Error Analysis does not focus on those aspects of language the learners actually manage, but reports a small part of the linguistic competence the student posses, becoming an insufficient device for the production of data on which an instructional program could be based.

7. 1. 2. Contrastive Analysis

Considering Contrastive Analysis, the use of a corpus for linguistic analysis has been objected due to the fact that it does not reveal much about the linguistic ability of the subjects, since production is what primes over comprehension of the language to be learned. This proves that predicting errors is not a simple task, since in many cases, the errors found went beyond the set of possible errors which were predicted, being possible to conclude that it is impossible to generalise linguistic competence the subjects actually would have, because despite the fact that none has academic studies of English, all of them have different backgrounds on English language, proving that, as it was already established, when an intralingual interference occurs, it is not possible to reflect any kind of structure, in the sense that what has been collected are mere generalizations of a partial exposition to the target language. It must be considered the fact that when studying phonic interference, it is necessary to consider not only the phonological systems of both L1 and L2, but the syntactic and lexical levels as well, considering that "the various levels

of linguistic structure are interdependent" (Nemser, W. 1971: 60). When dealing with 'modality' it implies the production *per se* and the perception the informants have when exposed to the TL. Besides, on the one hand, sounds that share some phonological features in both the NL and the TL often present a high degree of difficulty for learners, tending to recognise them as identical, and consequently, being pronounced approximately to their mother tongue. On the contrary, sounds that appear to be quite different to learners' NL, do not present learning problems and were produced satisfactorily, being possible to establish that CA only provides predictions of possible areas of phonetic interference, and therefore, not having a consistent significant predictive power. In this case, the use of Approximative Systems as relevant considerations in CA would be useful, since an important amount of deviancies do not have any source on both L1 and L2, giving them a strong autonomy as distinct from the target language and the mother tongue.

Since our corpus was obtained from a single session, we could neither describe the process of learning of our informants nor measure its systematicity. However, it has been possible to draw the processes that lie between L_s and L_t in the whole group, by analysing phonologically some of their La forms in order to establish an evaluation towards their English.

The lack of stability in the learner's Approximative System, due to the continuing improvement in learning the target language that S.P Corder refers to, is plainly reflected in deviant utterances like [aˈjein̥ts] which later becomes [eˈɟen̥st] by the same speaker. Thus, they would surely present problems of interpretation to a native speaker of English. At the same time, the author makes explicit that idiosyncratic dialect conventions are not shared by a social group. In this respect, the analysed corpus was produced by subjects who did not share any linguistic background.

Finally, positive and negative transfer work in different ways. For example, in the case of "burst", the speaker's mother tongue has the initial sound /b/ as part of its phonological system, a fact that makes it easier for the speaker to pronounce it correctly, even though this sound is in free variation with its fricative counterpart. This is a clear example of positive transfer and the lack of accuracy of CA hypothesis.

7. 1. 3. Phonological Stages

In relation to the psycho-phonemic and physio-phonetic stages, we have concluded that the psycho-phonemic problem is more plausible to be solved in a shorter period of time, since the speaker would possess the essential physiological movements and appropriate sounds of the target language. Although in our investigation we did not find anybody that fixed in this classification of having perfect English sounds and not having the acoustic image, we can say that, in general terms, the subjects we worked with acquired the sound image quickly after receiving the input with the correct pronunciation of the words. It was not relevant in the acquisition of this whether the words were long or short, or whether they had a complex environment for the speaker.

On the other hand, the physio-phonetic stage is the most difficult problem to solve, because the speaker does not handle the sounds of the target language, in this case, English. In fact, it is unlikely to find an adult speaker that acquires "foreign" sounds easily -considering that his or her mouth cavity is accustomed to other ones- as well as to acquire the faculty to produce certain sounds that belong to the mother tongue's phonological system, but that occur in other positions that are not usual in the L_1.

Furthermore, according to the results exhibited in this investigation, we can state that if a Chilean Spanish speaker has a basic knowledge of English, he or she will show both the psycho-phonemic and the physio-phonetic problems; since this person would not manage the acoustic image of a determined English word nor possess the appropriate sounds of the English phonological system, he or she will replace these by the ones typical of their language. Therefore, the process of repair would take longer and would be more difficult.

For these reasons, we noticed that the psycho-phonemic problem is the first one to be solved and, also, that it is likely to be mended immediately after the speaker has received the correct input; whereas the physio-phonetic problem takes longer to be solved, since it requires more practice and adaptation of the subject's organs of speech; therefore it is not immediately fixed after the feedback and there is not a particular timeframe in which we could assert that a speaker would acquire the sounds correctly.

7. 1. 4. Processes.

When we finished analysing the signals recorded by the group of Chilean Spanish speakers, we noticed that, after they received the input with the correct pronunciation of the words, they mended their errors in pronunciation partially and sometimes totally. Therefore, they over exceeded the amount of both deviant and correct forms we had predicted for each word. Also, there were certain sounds that were not always corrected after listening to the input, such as the voiced, palato-alveolar, fricative /ʒ/; a sound that is present only as a variant in our phonological system, [ʒ]. On the other hand, there were other sounds that were easily corrected, such as the voiceless, alveolar, stop /t/ which, at first, was represented by the voiceless, dental, stop [t̪]. This fact establishes that certain sounds will always be more plausible to be mended, and there are some others that require a longer process of repair; especially, if they are not part of the phonological system of the speaker.

Regarding the phonological processes analysed in this piece of research, substitution is the most common one, which corresponds to a 67%, since most of the consonant sounds in English behave as allophones of other phonemes in Spanish, facilitating the alternation of the sounds by a Chilean-Spanish speaker, despite the fact that we possess most of the English consonant sounds in our phonological system. For example, we possess the voiced, velar, stop /g/, but this is not applied in a word like <against>, since, due to its phonological environment, we tend to use an allophone of it, the voiced, palatal, fricative [ʝ] if the vowel sound is pronounced as /ei/ or /e/ (front sounds); or a voiced, velar, fricative [ɣ] if the vowel sound is pronounced as /ai/ or /a/ (back sounds).

Moreover, there are some other sounds that, though they are not allophones of our Chilean-Spanish phonological system, share most of the characteristics with our consonant sounds; a fact that explains to a certain extent why they are replaced by specific sounds. For example, the replacement of the voiced, alveolar, stop /d/ by the voiced, dental, stop [d̪]. As we know, when a speaker produces another sound, which is not the correct one, this is immediately noticed; still, this does not cause any type of confusion and the intelligibility is not affected.

7. 1. 5. Other Factors

In the case of CA, the phonological level is not sufficient when comparing two languages, since it does not provide an integral explanation for the concept of intelligibility. In other words, when changing the phonological aspect of a lexical item, its meaning and grammatical category can also be altered e.g. [aˈɾein̪] as a deviant form for the word "Against".

 Here are some examples of these errors and how they affect the intelligibility of a word:

- Against   > *Again*: [aˈɾein̪], [eˈɾein̪], [aˈjen̪]

- Burst   > *Bore*: [boɾ]

            > *Best*: [ßes̪t̪]

- George   > *Your, You're*: [joɾ]

- Mouth   > *Mouse*: [maus]

- Scientist > *Science*: [ˈsajan̪s]

- Wouldn't > *Hole, Whole*: [houl]

            > *Weren't*: [ˈweren̪t̪]

As Johanson's data indicates, besides language transfer, other processes such as overgeneralisation and approximation occur. In this regard we have concluded that Chilean speakers tend to assume that the grapheme "u" is always pronounced as the vowel sound /ʌ/ as in common lexemes such as *run* and *cut.* In the experiment, the most illustrative cases are those of the word *student* in which one of the informants used the vowel sound /ʌ/ instead of /juː/ for the pronunciation of the grapheme "u". The same phenomenon was found in some productions of the word *burst* whose deviant form was [bʌɹst̪].

Other example of overgeneralization is clearly seen in the word *behave,* which was produced as [biˈhaß], [ˈbixaß], and [ˈßixaß].

7. 1. 6. Intelligibility

It was not feasible to establish a hierarchical classification of the phonological processes; in other words, whether certain process must be more penalised than others at the moment of the evaluation of an erroneous form. In addition, it is not possible to assess utterances from the amount of errors involved .As our table evidences, there are both monosyllabic and polysyllabic words that, on the one hand, display several processes, which do not necessarily alter the meaning of the words. On the other, in some cases, both lengths of words present only one or two processes that completely modify meaning. Hence, there is no systematicity, that is to say, there is no directly proportional relation between the length of a word –and the number of processes involved in it- and intelligibility.

As Nemser asserts, the Approximative System varies according to the learner's level of proficiency being affected by learning experience, communication function, personal learning characteristics, etc.", which can be clearly illustrated in one of the deviant productions from which we inferred and later corroborated that the informant was strongly influenced by her previous knowledge of French:

e.g. When pronouncing *vegetable*, the speaker produced [ßeʒÿ̈ta¹ßl]. In this example, the presence of three elements combined, namely [ʒ], / ÿ /, and the shift of stress towards the end of the word gave us a hint to think that the informant possessed previous knowledge of French. Therefore, we infer that her Approximative System of French exerts a strong influence on her performance in English because until now the former is her second language.

In a broader sense, as the same author claims, the learning behaviour is predictable by comparing L_s and L_t., being feasible to look for strategies to be applied to the field of language teaching.

Following Jain's idea- systematic, asystematic and unsystematic errors, and the importance he gives to learners' errors- it could be possible for a teacher to deduce what errors would come next and to use this theory as a method to infer the learners' necessities by identifying their interlanguage.

7. 2. Limitations and ideas for further studies.

As EA and CA do not regard sociolinguistic aspects as central factors in the investigation, and as we based our research in it, there were some factors that we did not consider such as a more accurate description of the actual level of English of every informant, e.g. where they studied, for how long, what they learned, among others. The information we had and the main requirement of our experiment was that they had had English as a school subject and that they had not pursued studies on it. Besides, the informants recorded the samples once, since our corpus was obtained from a single session, we could neither describe the process of learning of our informants nor measure its systematicity. However, it has been possible to draw the processes that lie between L_s and L_t in the whole group, by analysing phonologically some of their L_a forms in order to establish an evaluation towards their English. Furthermore, we could not provide enough evidence to neither support nor corroborate Jains's theory on learners' errors, e.g. unsystematic errors correspond to slips of the tongue, but it is impossible for us to determine if this was the case of the informants' mistakes or if their performance was affected by anxiety or actual lack of knowledge.

In a broader sense, as current trend emphasise the focusing on the learners' systems as a whole, we could not consider the informants systems since CA paid too much attention to grammar, leaving phonology and lexis aside. In this respect, we focused on sounds and did not use sentences but isolated words in the experiment, in a way to narrow down our investigation and obtain more accurate results.

As it was already mentioned, Applied Linguistics has only been applied to grammar and lexis. For this reason, we suggest that the learner's productive and receptive competence can be analised from a phonological point of view. For example, in our experiment we noticed that the speakers greatly improved their performance after having heard the target pronunciation; in other words, in this process of imitation the two types of competence —receptive and productive— are used at the same time competences.

7. 3. Software

After having analysed the results, it is possible to draw some important conclusions regarding the development of this research as a contribution to the design of the software.

On the one hand, it can be seen that the students are more willing to participate when using the software than when being in a classroom, enhancing the efficiency of individual assignment. They feel more comfortable and free to talk without fearing being intimidated by their peers if they make a mistake. Besides, students have the advantage of quickly learning how to use this software, for they deal with technological devices in their daily lives, so the teaching of English, or any other foreign language, becomes more interesting and attractive for the learner.

On the other hand, the use of this kind of technology must be treated carefully and, always, as a complement to what the teacher does. It is important to emphasize the idea that no machine can replace the teacher and his participation in the classroom. He gives the students the necessary background and, at the same time, he corrects their mistakes, while the software performs the role of a "workbook", in which students put into practice what they have learned in class. It does not provide the knowledge students need, but it helps to reinforce what they already know.

Another aspect that we would like to highlight is that linguistic knowledge must be taken into account in the development of this software, and any other device that focuses on language teaching. As language is usually taken for granted, i.e. all people are supposed to acquire it, some problems arise when technologies to teach a language are developed without the aid of an expert in language, English in this case. Therefore, a device that is supposed to improve one's skills in foreign language acquisition, in the end, proves its failure when trying to teach it, especially when the person has neither previous academic background nor any tutor to guide him. Studies on pronunciation as a part of the L2 curriculum have proven that the input alone is not enough to improve the student's pronunciation, but explicit instruction, which will give him contrastive references to the Spanish sounds, technical terms to understand better the phenomenon of phonetics, and the notion of intelligibility, including some cultural aspects of it (e.g. native speakers' tolerance to non-native

speakers' errors)[4]

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