Profiling the Phonological Processes Shaping the Fossilised IL of Adult Spanish Learners of English As Foreign Language. Some Theoretical Implications.

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ABSTRACT

In the ever-growing literature dealing with the acquisition by adults of the phonetics and phonology of a foreign language (FL), research has tried to provide an answer to the complex nature of cross-language transfer. The fact that despite idiosyncratic differences and sociolinguistic variation most adults learners of a foreign language (FL) speak with an accent which is a reflection of their native language (NL) and that their progress is impaired at a certain stage prompted a host of questions such as whether adults follow identical or different paths of development in their approach to a foreign language, whether those speaking the same native language are able to identify target language categories in the same way, whether perception and production are interdependent, the nature of the learning abilities and the interplay of transfer with universals. These and other problems relating to foreign language speech have been approached from different angles and theoretical frameworks (see Leather & James (1991) for an overview, and more recently Leather (1999).

The research reported here, based on the oral production of sixty-five Spanish adult learners of English as a FL, tries to shed some light on one of well-known problems related to the acquisition of a foreign language by non-native speakers: the analysis of different types of phonological processes shaping the fossilised interlanguage (IL) of adult FL learners in order to see a) whether they are adhered to by those adult learners sharing identical L1; b) whether

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frozen IL reflects transfer from the leamer's L1 or is the result of developmental (i.e. universal) processes. In this connection we shall examine the extent to which the leamers' IL reflects the alleged tendency to reduce complex syllabic margins to a Universal Canonical Syllable Structure (UCSS). We shall also discuss the explanatory power of some universal phonological models like Major's Ontogeny Model (1987) and Similarity/Differential Rate Hypothesis (1999) or Ekman's Markedness Differential Hypothesis (1977) and Structural Conformity Hypothesis in connection with some of the processes under analysis. Optimality Theory will be brought in in dealing with some problems encountered under Cluster Simplification. Ultimately, we shall try to explain why adult speakers of a language like Spanish tend to identify target categories in much the same way without necessarily having to resort in all cases to language universals as decisive factors shaping their IL.

KEYWORDS: phonological processes, adult FL acquisition, frozen IL, IL phonology.

I. INTRODUCTION

Right from the dawn of Contrastive Analysis Hypothesis (CAH) , Weinreich (1953) and Lado (1957) envisaged adult foreign language phonological behaviour as being heavily dependent on the leamer's L1 structure. The fact that the adult leamer of a foreign language (FL) cannot go beyond a certain phonological barrier despite idiosyncratic differences, triggered off a movement based on the technique of comparison-prediction-description as a means to provide a scientific description of the native and the target language alike, all cross-linguistic phonetic differences between the two being resolved in terms of the former. The force of the mother language was manifested in the degree of 'phonic interference' that takes place at the production as well as the perception level. Lado referred to 'distortions' in the first case while perceptually such influence would be manifest in the presence of 'blind spots' (1957: 11) responsible for inhibiting the perception of sounds other than those occurring in one's own language. Such 'phonological sieve' (Trubetzkoy, 1939) is acknowledged as being responsible for two of the most important features that characterise adult oral behaviour: fossilisation and concomitantly 'foreign accent', its perceptual manifestation. Soon the emerging language, generally known as 'interlanguage' after Selinker's 1972 influential paper was seen as an essentially idiosyncratic system. Those 'deviant linguistic systems' —notice the pluralization (Nemser, 1971: 116)[1]— distinct from both the NL (native language) and the TL (target language) have been the object of intense research during the past forty years from psycholinguistic, linguistic, cognitive, sociological, and contextual standpoints (Monroy, 1990; Lalleman, 1996).

A perennial problem since Lado's pronouncement has to do with the core question as to why adults can cope with acoustically different varieties found in their own language and yet are

unable to perceive foreign sounds correctly. L1 influence (transfer/interference) and source of error have been key concepts on which much research has hinged. American Structuralism posited a causal relationship between the terms, seeing interference from L1 as the most important source of error. Since then a number of researchers have considered errors as a reflection ofprocesses that take place in the learner's IL whose origin is traceable to the learner's L1. The overriding role played by the speaker's L1 as a fundamental template which conditions to a large extent the type and pace of the learner's output, particularly at the phonetic / phonological level, is well documented and has been widely acknowledged (Scovel, 1969; Tarone[2], 1978, 1980; Flick, 1979; Felix, 1980; E c h a n, 1981; Kellerman, 1983; Wode,1980, 1984; Broselow, 1984,1987; Sato, 1987; Ringbom, 1987; Odlin, 1989; Major, 1994; James, R.A (1996). The impact is so strong that despite the enormous amount of research devoted to L2 and FL acquisition, transfer continues to be considered by many as the most important factor in adult FL acquisition.

The empirical discovery of patterns that apparently are not attributable to one's first language and that are not fully explained on the basis of a simple comparison of L1- L2/FL phonological structures (Nemser, 1971; Johansson, 1973; Flege & Davidian, 1984; Major, 1987) have favoured the view that universal phonological constraints are concurrent if not decisive factors shaping the learner's IL[3]. As a result, a fundamental distinction[4] has been drawn between interference vs developmental (universal) processes which underlies current phonological theories such as Natural Phonology (Donegan and Stampe, 1979) or Hancing-Bahtt and Bahtt's Feature Competition Model (1997) within Optimality Theory (OT). From a universal grammar (UG) perspective, research has focused on the study of the difference between L1-L2/FL acquisition to see if UG grammar is accessible or not to the L2/FL learner. Another important area of research in generative linguistics is the analysis of L1 influence on FL acquisition. This issue has been addressed using the concept of markedness and parameter theory.

Eckman's Markedness Differential Hypothesis (MDH) (1977, 1985) is precisely an attempt to provide an explanation of FL learners' difficulties in terms of markedness differentials or typological characteristics of L1 and the target language: forms in the FL more marked than NL forms are postulated to be more difficult to acquire than those that are different but unmarked. This alternative to CAH predicting the 'directionality of difficulty' (1987: 55) and explaining degrees of difficulty from a universal perspective has had considerable support (Anderson, 1987; Eckman, 1987; Carlisle, 1988; Hammarberg, 1988, but see Sato, 1984; Altenberg and Vago, 1987[5]; Cichoki et al., 1999). However, Eckmam seems to have abandoned it as there is evidence that some learners choose the least marked option in spite of having the marked one in their L1. In his Interlanguage Structural Conformity Hypothesis (1991) he stresses typological markedness further, stating that "the universal generalizations that hold for the primary languages hold also for interlanguages" (1991: 24), which seems to exclude L1 influence altogether. In Eckman and Iverson (1993) typological markedness is seen as paramount in accounting for FL syllable-structure acquisition. Carlisle, on the other hand, envisages in his

Intralingual Markedness Hypothesis (1999) markedness relations within L2 as well as between L1 and FL as possible constraints on transferability of forms from L1 .

Still within typological markedness, syllabic segment variable sonority has being postulated as a correlate of the order of acquisition. Tropf (1987) considers that it is sonority rather than syllable position which determines consonant acquisition. Working within a Universal Canonical Syllable Stmcture frame he sees degree of sonority as the main conditioning factor of the ordering of all syllable elements. Thus vowels, glides, liquids, nasals, fricatives and plosives depart from sonority in an increasing order. Clements (1990) Sonority Dispersion Scale also predicts that onsets with steady increase in sonority (e.g. /bl...br/ are less marked than those with very steep increase. In fact, sonority-sequencing restrictions are increasingly discussed as part of the information potential of different segments (Prince & Smolensky, 1993; Ohala & Kawasaki, 1997).

Parameter theory (Chomsky, 1981), the other research line within generative grammar's concem with L1 influence on L2 , addresses the issue whether L1 parameter values hold in a FL context. If a parameter consists of a number of characteristics that form part of a UG and languages differ in the value of the different parameters, it is obvious that children acquiring their L1 leam to set the appropriate parameter values. The question arises whether FL leamers are capable of resetting (i.e. transferring) parameters that do not tally with those already acquired. There is currently some empirical evidence —mostly restricted to syntactic pattems (but see Broselow and Finer, 1991)— both for and against UG-accessibility by FL learners, particularly in the USA where UG is the dominant theoretical framework. Non-linear phonology in any of its variants (autosegmental, metrical, feature geometry or lexical phonology) is taking promising steps in an attempt to explain whether adults are successful in acquiring an L2/Fl, but the fact that the Principles and Parameters may progressively fade out after a certain period of time makes the theory questionable from a FL perspective. As Lalleman writes, "the conclusions that various researchers draw from their results often contradict each other" (Lalleman, 1996: 49).

As early as 1972, Tarone[6] was concemed with universal constraints affecting the learner's syllable structure in terms of open vs closed syllables. She considered (1980) that the FL leamer IL syllable stmcture is influenced by three main universal processes: transfer of Ll phonotactic pattems into L2/FL, L1 reactivated processes such as syllable deletion, and universal processes of different types, such as simplification towards an open CV syllable. Their dominance is assessed in terms of syllable alterations. Research has apparently confirmed in many cases that the open CV pattem is the most universal syllable type, clusters in coda position being a function of the jakobsonian notion of markedness.

Due to the crucial role played by syllable structure in the production and perception of language, it has been approached as being the result of a number of forces intervening in its acquisition and configuration, hence it has provided the basic frame for typological approaches and universal processes underlying the structure of a FL phonology such as the 'Sonority

Phonological Principle' (Broselow & Finer, 1991; Archibald & Vanderweide, 1997), the 'Markedness Principle' (Ekman, F.R. 1977,1987; Ekman and Iverson, 1993); Major's Ontogeny Model, 1996), Flege's Speech Learning Model (1988) or Clements' Sonority Dispersion Scale (1990), among others[7].

The interaction of universal processes with transfer[8] has attracted increasing attention due in no small measure to the impact of theoretical linguistic models which underlie much work done in FL phonology. Thus the issue of universal processes was first addressed by Natural Phonology (Stampe, 1969; Donegan & Stampe, 1979) the phonological structure of all languages being envisaged as a 'residue' of a universal set of processes which are innate realisations of implicit phonetic forces. In the case of second or foreign languages, acquisition is seen as consisting of a gradual suppression of those processes which, although part of a universal set characterising human speech, do not occur in the leamer's IL. Adult FL leamers would apply to the target language those natural processes that shape their L1 together with those which have not been suppressed during their L1 acquisition. At first, the residual processes would govern the perception and production of the target language. Progressively, the interfering processes would give way to those that are present in the FL.

Major's 'Ontogenic Model' (1987, 1996) —a development of Stamp's ideas — sees FL acquisition as a competition between interference and universal or developmental processes. Natural Phonology predicts that those processes not suppressed by the learner's L1 will appear in L2/FL acquisition provided they are reflected in any adult language. At the early stages, Major claims interference prevails over developmental processes while in the course of the acquisition developmental processes increase and then decrease as the learner approaches the target language. Native-like phonological competence is attained when both types of processes are eliminated. He envisages identical acquisition mechanisms for L1 than for L2: natural phonological processes are innate since the order of acquisition of sounds in an L1 context is 'strikingly similar across languages' (1987: 211). And the 'same processes for L1 and L2 learners' (1987: 213) intewene. There is then a universal order underlying L1 and L2/FL acquisition[g], notwithstanding asyrnmetrical relations due to the fact that some substitutions derive from the learner's native language while others derive from universal principles of order. This is reflected in 'loan phonology', as he calls it, where most terms fit the NL patterns. Some loan terms may enter into a conflict with L1 structure; this is due, according to Major, to universal principles of order or acquisition and markedness. A further universal principle he puts forward refers to precedence, whereby strengthening or fortition processes precede weakening or lenition processes, the former being more typical of formal styles while the later are favoured in casual styles.

This theoretical framework claims to have strong explanatory power in that it integrates synchronic, diachronic and first and second/ foreign language acquisition into one framework (Major, 1986); it can also predict which process can apply to a given sound class. It fails, though, in that it does not predict the type of process intewening on a particular occasion as no

implicational relations hold between processes (Donegan, 1978, cited in Leather, 1999).

No empirical evidence has conclusively **proved** which of these processes —**transfer** or developmental — **is** paramount in accounting for FL syllabification nor is there agreement on the number of phonological processes involved and their respective importance. Thus while **several** researchers (Tarone, 1980; Greenberg, 1983; Kellerman, 1983; Broselow (1984)''; Wode, 1984; Sato, 1984); Ringbom, 1987; Hammerly, 1991; James, R.A. 1996) present evidence and subscribe to the view that the **majority** of errors are a reflection of L1 processes that **have been** transferred in their integrity, while a variable amount may be ascribed to phonological **universals,** there are those who consider that L1 and L2/Fl are shaped by different phonological processes. Syllabic suppression, for **instance,** is a process fairly common in L1 acquisition (e.g. (ba) nana)'' which **does** not occur in an L2/FL context (Oller, 1974, cited by Tarone, 1980). Likewise, reduplication processes —**also** common in child **language**[12]— are not reported in the IL of the adult learner. On the other hand, a process like epenthesis **does** not occur in an L1 learning context (Macken & Ferguson, 1981). Still others, like Hecht & Mulford (1987) follow Fergusson and **Debose** (1977) and Wode (1980) in considering that neither transfer nor developmental processes alone **provide** an adequate explanation of FL phonological development. Transfer is thought to predominate in the acquisition of fricatives and affricates, whereas developmental processes would best predict sound substitutions for difficult segments. Liquids and stops would stand between these two poles, the former being arnenable to transfer whereas stops would be more affected by developmental processes.

In his 'identity hypothesis', Wode (1976) claimed that the phonological processes shaping the leaming of an L1 are the same as those intervening in the learning of an L2/FL —a view denied by Schachter (1989) among others. Such processes, considered to be universal, are **seen** as being governed by perceptual and articulatory restrictions and as applying to an abstract phonological representation''. One of the tenets of CA was precisely that the adult leamer could not hear sounds different from those found in **his/her** mother tongue. There are occasions, however, when one **is** able to hear sounds one **is** unable to produce. If leaming a language means being able to produce its sounds correctly, this presupposes an equally correct perception which must precede **all** production (Leather, 1999). But production in the case of adult FL leamers can be impaired by a number of **factors**[14] such as the inherent difficulty of certain sounds (Johansson, 1973) —a view questioned by Neufeld (1980)— the development of inaccurate perceptual **targets** (Flege, 1981) or by universal phonological **constraints**[15]. What seems obvious **is** that there must be **some** articulatory or perceptual constraints that affect most speakers sharing identical L1. Wode (1996) **assumes** in his Universal Theory of Language Acquisition (UTA) that all humans are endowed from birth with speech perceptual abilities that are non-language specific. They apply across **all** language domains whenever phonological **adjustments** are needed to comply with dialectal, sociolectal or **stylistic** changes. In his view the human auditory system **is** characterised by points of heightened sensitivity to certain acoustic dimensions, sounds being perceived either 'categorically' or 'continuously'. Both categories are claimed to remain

unchanged throughout life (Wode, 1996: 338). Categorical perception is said to capture sounds as belonging to classes and to establishes language-specific stable category boundaries. This type of perception resembles Kuhl's 'native language magnet' (NLM) where L1 phonetic prototypes assimilate nonprototypical members of the same family and constrain adult perceptual abilities to perceive differences in the target language. Continuous perception, on the other hand, allows learners (even slow ones) to detect differences between L1 and L2 categories. In the case of similar sounds, some adjustments are made in the direction of the TL. New phonological elements may be acquired by FL learners in much the same way as L1 learners (original categorical sensitivity, identical continuous perception identical to that of children, identical interaction of categorical and continuous perception). This is claimed to be a mechanism valid for all types of learner irrespective of age. The fact that most adult learners are unable to achieve a native-like mastery of a FL is explained by Wode in terms of L1 intervention: continuous abilities remain unchanged, but he acknowledges that "the interaction of continuous and categorical perception becomes more difficult as the categories of the L1 are established" (Wode, 1996: 334).

Major (1987) draws a distinction between learners with excellent perceptual abilities for non-native sounds and those with poor perception. The former's mental representation for target sounds are posited as being identical to that of the native speaker; the learner's production being the result of interference and developmental processes as he approximates the target forms. Those with poor perception, on the other hand, would have a target identical to their native language or somewhat intermediate between native and target language. They would have to improve both their perception and production, fossilisation occurring the moment the learner is unable to proceed further in perceiving or producing target language forms.

The equation of L1 with L2/FL acquisition processes is, as pointed above, at the base of much research in generative linguistics. If human beings are endowed with innate linguistic abilities to acquire their L1 as part of a Universal Grammar, an attractive issue is to consider whether second/ foreign learners also have access to such knowledge in building up their grammar. Opinions differ[16] as to whether the learner has direct accessibility to such principles and parameters— in which case parameter resetting is possible— or whether UG is indirectly accessible —parameter resetting being then disallowed. The idea that identical UG principles underlie L1 and L2/FL acquisition was favoured by Richie (1978) and is currently maintained by Broselow and Finer (1991) Minimal Sonority Distance Parameter, Eckman's Structural Conformity Hypothesis (1991), Schwartz and Hulk (1996) and others. Empirical evidence—the difficulty of resetting parameters and attaining complete phonological competence in the case of adult learners— has led some researchers to adopt a more realistic standpoint. Thus Clahsen (1988) does not believe in the accessibility of UG to L2/FL learners who might resort to general cognitive strategies instead of universal language properties. Felix (1985) claims in his Competition Model that the FL has only partial access to UG as the LS (language specific) cognitive system gives way to a general problem-solver (PS) system. Klein (1990) adopts a more

drastic standpoint suggesting the rejection of generative **grammar** if UG principles do not apply to L2/FL leamers. A compromise between interference (L1 overriding effect) and universal or developmental processes is Hancing-Baht's **Feature** Competition Model (1997). Using Optimality Theory as a theoretical framework, a theory that relies on **ranked** constraints rather than rules to define an optimal output, she envisages two paths for FL/L2 acquisition: an L1-mediated and a direct route, linked to the principles and parameters of UG.

     After this brief presentation of **some** fundamental trends in L2/FL acquisition, we set out to describe the main phonological processes that underline the IL of our adult students in order to see the effect of L1 transfer and developmental processes. In doing this we shall consider **some** of the theoretical pronouncements presented above in conjunction with the speakers' verbal behaviour. In particular we shall see the extent to which syllable restructuring towards a universal canonical pattem is confirmed by our data. **References** to **Major's** Similarity/Dissimilarity Hypothesis and his Ontogeny Model will be made in relation to certain substitution processes. Substitutions and cluster reduction will **also** lead us to formulate **some** remarks about **Eckman's** MDH and **Structural** Conformity Hypothesis.

II. AIMS

Taking for granted that L1 transfer occurs and that it exerts a **powerful** influence in the mastery of a foreign phonology, we decided to test the degree of NL phonological dependence and the types of phonological processes involved in FL production.

     The difference between this and other similar studies lies in that our focus is not on a particular intermediate stage of the IL continuum, but rather on the output of FL leamers who, irrespective of individual differences and length of formal instruction, consider themselves to **have** reached a high degree of fossilisation in their IL. This happens when the adult leamer of an FL **cannot** go beyond a certain phonological bamer irrespective of the length of exposure to the target language. It is a fixed stage in pronunciation habits which, irrespective of the length of formal instruction, unrnistakably betrays a leamer as speaker of a given language —**Spanish** in our case. Thus rather than dealing with an idiosyncratic behaviour, we are faced with a general phenomenon affecting the speech of most adult leamers, if not **all** as Scovel (1969, 2000) claims, sharing identical L1 to such an extent that not only NL speakers may correctly **identify** a speaker of an FL as a member of their community: native FL speakers, **using** phonological information, can easily **ascribe** a given foreign accent to its corresponding NL. And although such a **barrier** can be at variable **distance** from the target language, adult leamers undergoing formal instruction for a number of years reach a common plateau that can be described as a kind of 'Typical Conversational IL' showing **features** that are shared by a large number of adults with identical L1. In this cross-sectional research we shall be delving into the nature of such IL in **order** to **discover** what is language (L1) specific and what is **not**. More specifically, we seek

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1. To identify those phonological processes underlying the fossilised IL of adult Spanish speaking leamers of English as a FL in order to see the extent to which they are adhered to by all informants, and to ascertain the degree of phonological dependence of such processes on L1 phonotactic pattems and syllabic structure.

2. To discover whether the output of our informants conforms to a universal tendency towards a Canonical Syllable Stmcture (CV) dueto its unmarked character as postulated by Tarone (1987) among others.

3. To discuss if the rules needed to explain the IL behaviour of our informants are all govemed by principles of typological markedness as posited by Eckman's MDH (1977) and his Interlanguage Conformity Hypothesis (1991).

4. To check the validity of Major's Ontogeny Model (1987) which sees FL acquisition as a competition between interference and developmental processes. In particular, we examine the extent to which interference prevails over developmental processes in the frozen IL of our informants. An interesting issue that we shall be discussing elsewhere is to examine whether there is any implicational relationship among such processes in the sense that the occurrence of a process in a given learner implies the presence of another process but not the converse.

5. Finally, to test Major's Similarity/Dissimilarity Hypothesis according to which dissimilar sounds are more successfully mastered than sounds that have similar counterparts in the TL. (Valdman, 1976; Flege and Hillenbrand, 1987; Major, 1987; Major and Kim (1999).

Despite the descriptive character of this paper, we are aware of a number of methodological problems related to the difficulty of operationalising key terms which underlie different proposals. 'Phoneme acquisition' is a controversial concept. It is usually assumed that sounds are acquired following a progression line and with no setbacks. The reality is, however, much more complex. Sounds are, to begin with, context dependent, so that the leaming of a given sound in a particular position does not imply its correct production in another context. There is evidence from child language acquisition of phonemic instability linked to context (Hemández Pina, 1978)''. Selinker's 'backsliding' (1972), a term that refers to a fortuitous setback in forms apparently already leamed, has not been suffíciently taken into account. Incidentally, such setbacks, which experience corroborates (also present in L1 acquisition), is a serious argument against all universalistic approaches which take as axiomatic that any rule that has become part of the leamer's competence is immune to any distortion or erosive process.

Unlike accuracy, intelligibility appears as a fuzzy concept. Intelligible speech is the minimum requirement for a FL speaker. Abercrombie's 'comfortably intelligible pronunciation'

(1963: 37) does not clarify things much despite his explanation that by comfortable he means little or no conscious effort on the part of the listener. There are so many variables (non-verbal ones included) which can contribute to or impair intelligibility that the concept is not of too much help to the applied consumer. Faulty pronunciation, phonological, grammatical, lexical or discoursal mistakes all play a role in profiling the listener's impression. The fact that lack of intelligibility can occur between L1 speakers, despite their alleged competence, clearly reveals that it needs further refinement in order to be a valid concept. Meanwhile we shall consider a stretch of language intelligible if it can be understood by the native speaker whatever the degree of phonetic deviance from the TL.

A related expression that is equally difficult to pin down is 'foreign accent'. While it is true that it is linked to a specific linguistic behaviour diverging from sounding native it is much more difficult to operationalise its characteristics as there is no demarcation between the IL phonology of the learner and his lack of mastery of the target language. If communication is granted, foreign accent will range between near native proficiency as regards both segmental and suprasegmental patterns and an IL variable continuum where syllabic accuracy would play an overriding role. As no suprasegmentals are considered here, we shall stick to TL syllable structure divergence in phonological terms[18] as the key criterion for accentnesss.

III. METHODOLOGY

III.1. Informants

For this study 65 Spanish undergraduates were chosen. They were all Third Year students of English as a foreign language in the Department of English Philology at Murcia[19] University. They spoke Spanish tinged with Murciano, the local accentual variety characterised, among other things, by the instability of /s/ in coda position.

All had undergone formal instruction in English for more than ten years averaging a total of no less than 1800 hrs. of formal training, which goes well beyond the class time required for an average student to break the resistance level of most languages of the world (Diller, 1978). Two native English speakers defined their command of oral English as 'intelligible', without further qualification. All students participating in the experiment acknowledged that their level of phonological mastery of English had reached stalemate and that they did not envisage any further improvement in their pronunciation.

III.2. Materials and procedure

One outstanding feature of FL research is the enormous variation in the data reported. Indeed a large number of contributions focusing of L2 or FL pronunciation problems rely basically on

formal procedures to obtain data, which is in sharp contrast with those whose observations about FL learner's phonological competence derived from a natural speech situation. Only two out of the twenty studies appearing in Ioup and Weinberger's *Interlanguage Phonology* (1987) resorted to unprepared natural speech (Tench, 1996), unlike the rest of the papers where imitation, reading tests and other formal techniques were used as data to confirm or disprove their claims. And of the eight contributions to J. Leather's ***Phonological Issues in Language Learning*** (1999), only Munro and Derwing used as samples the description made by their informants of a cartoon page. Reading was the technique most favoured and interpretations of the results were made disregarding the effect, positive or negative, that orthography might have on pronunciation.

This methodological disparity —reading in particular— has obvious side effects on the research outcomes. The use of formal procedures, while stringent on specific phonological issues, may be heavily tinged by the orthographic format of the FL. Current research confirms the impact orthography has on phoneme awareness (Altenberg and Vago, 1987; Giannini and Costamagna, 1997; Young-Shoulten, 1997; Keiko Koda, 1998). On the other hand, formal speech, besides 'put[ting] people on their best behaviour' (Tench, 1996: 250), is not to be equated with informal, colloquial language, the most neutral and general register (Crystal, 1969) and where the 'most systematic patterns occur' (Major, 1999: 125). It is a fact that reading, by its reliance on the written support of a system, is a much more formal operation than ordinary spoken language. It is not surprising, therefore, and tautological to a large extent, to claim that FL leamers achieve greater accuracy as style becomes more formal, as Gatbonton (1978) or Sato (1985) suggest. A rigorous study of register is, therefore, a methodological necessity if results are to be trusted.

Since the analysis of the informants' oral output production was our main concern, each subject was interviewed individually for five minutes by two members of the staff who asked them to talk naturally about the most frightening experience in their lives. In this non-structured setting, they were allowed four minutes to think about the topic so that they could organise their thoughts. As a warm-up the students were asked to read a five-line text and then they were encouraged to speak freely. It was assumed that being a topic involving the student more personally, it would make them less self-conscious about the language they were using and would produce samples more closely resembling a real life communication situation.

Each conversation was tape-recorded and transcribed using IPA symbols by a trained phonetician. Although the technique may be anxiety provoking, this was minimised by using a small cassette that was operated by one of the interviewers. Evaluation of accentnesss was carried out by three judges independently, two native speakers of English and one of Spanish, all of them university teachers at the Department of English Philology. The sum of agreements and disagreements by at least two of the judges was used a reliability criterion. The sampling was carried out discarding systematically the first minute of the recording. Data were selected by extracting from each sample the first ten tokens that showed some type of phonological error.

Following Briére 1968; Greenberg, 1983; Carlisle, 1999 and others, we decided to take

the phoneme within the syllable as the basic unit, but without losing sight of the word as a concurrent operational unit. There are three main reasons for this. Firstly, in spite of the difficulty of delimiting single syllable boundaries in English it is intuitively a clear operational unit for Spanish speakers. This is all the more evident when we consider a process operating across word boundaries where Spanish is a very versatile language. Secondly, in an FL context, the leaming of written language is inextricably entwined with the syllable whose limits are fairly often coincidental with word boundaries. Finally, the syllable would not be as good as the word to capture certain accentual, durational and rhythmical aspects in a FL context.

The standard against which the testees' performance was measured was careful colloquial RP English as reflected in Daniel Jones' 16th edition of his *English Pronunciation Dictionary* edited by Peter Roach and James Hartman (CUP).

III.2.1. *Spanish vs English syllabic structure*

Spanish is charactenzed as being a language with a simple syllabic structure with a clear preference for the CV type, the overall shape being (C) (C)+ (V)(V) V + (C)(C) (Monroy, 1979). An examination of Olsen's syllabic typology for Spanish (1969) yields a percentage of 58.45 % of the CV type, followed at a certain distance by the CVC structure (27.35 %) and a much more distance by the CVV type (6.34 %). It shares with English an optional two-phoneme head and coda, but it will not allow initial three-phonemic clusters nor final combinations of more than two segments. Furthermore, the final biphonemic sequence is allowed only word internally, otherwise only four single consonants can occur: /l,m,n,s/. Moreover, syllable boundaries are constrained by certain conditions, so that if a consonant occurs in a checked position and a vowel follows, the former will automatically be assigned to the following syllable (ambysyllabic principle). There is little doubt that this structural simplicity accounts for the fairly clear intuitions Spanish speakers have about syllable boundaries in the language.

English, on the other hand, has a much complex syllabic structure. As said above, clusters of up to three phonemes are allowed syllable initially, whereas a consonantal sequence of up to four phonemes can occur in syllable final position (O'Connor and Trim, 1953). It is theoretically possible for a sequence of as many as seven consonants to occur across word boundaries (Gimson-Cruttenden, 2001). Besides, syllabification rules in English are much more controversial than in Spanish to the extent that "there exist three rival and incompatible views of English syllabification" (Wells, 1990: XX). This obviously impinges on the analyst's view when confronted with leamers' problems in perceiving and producing English as an FL.

The following table reflects the usual combinatory phonotactic possibilities within the syllable in both languages (British and Castilian varieties):

SYLLABIC STRUCTURE			
		(British) English[20]	(Castilian) Spanish
ONSET	1 cons.	All but /ŋ/, /ʒ/ very rare	All but /r/
	2 cons.	/k/ + /l, r, w, j/ /p, b, f/ +/l, r, j/ /t, d/ +/r, w,j/ /s/ +/l, w, j/, /p, t, k, f, m, n/ /g/ +/l, r/ /θ/ +/r,w/ /ʃ/ +/r/ /h, m,n,l/ +/j/	/k/ + /l, r, (w, j)/ /p, b, f/ + /l, r, (j)/ /t, d/ + /r, (w, j)/ /s/ + /(w, j)/ /g/ + /l, r/ /θ/ + /r, (w)/ /m, n, l/ + /(w, j)/

	3 cons.	/s/ +/p/ +/r, j/
		           +/t/ +/l, r, w, j/
		           +/k/ +/r, j/	

PEAK	1 vowel	Short: /ɪ, e, æ, ʌ, ɒ, ʊ/ Long: /iː, ɜː, ɑː, ɔː, uː/	/a, e, i, o, u/
	2 vowels	Dipth: /ɪə, eə, ʊə, eɪ, aɪ, ɔɪ, aʊ, əʊ/	/ai, au, ei, eu, oi, ou, wa, we, wo, ja, je, jo, wi, ju/
	3 vowels	Tripth: /eɪə, aɪə, ɔɪə, əʊə, aʊə/	/jai, jei, wai, wei/
CODA	1 cons.	Except /h, r, w, j/, all consonants (called 'final')	End word: /l, r, n, s/ End syll.: also /p, b, k, d/
	2 cons.	/m, n, ŋ, l, s/ (called 'pre-final') + 'final' cons. 'Final'+/s, z, t, d, θ/ (called post-final)	Only end of syllable: /ns, bs, ks, rs/
	3 cons.	Pre-final + final + post-final Final + post-final + post-final	
	4 cons.	/l + f + θ + s/ (*twelfths*) /m + p + t + s/ (*prompts*) /k + s + θ + s/ (*sixths*) /k + s + t + s/ (*texts*)	

III.3. Results

After the pooling of the data, ten main phonological processes (see Figure 1) emerged in the IL syllable structure of our students. Five affecting vowels (prothesis, vocalic epenthesis, vowel fusion (synaeresis), vowel substitution (quality) and vowel substitution (duration)) and five related to consonants (consonantal insertion (epenthesis), consonant substitution, consonant assimilation, voicing/devoicing and cluster simplification (apocope). All of them are manifestations of the three macro-processes of addition, subtraction and substitution, which happen to occur across many languages. Their concrete manifestations were in all cases coincidental with the phonological processes shaping the learners' L1. Thus, under addition we

found both prothesis, or word initial vowel insertion, and epenthesis which refers to either vowel or consonant insertion word medially or final. They represent a trend to accommodate to a Spanish syllable structure, not necessarily of a universal CV syllable type, as we shall see.
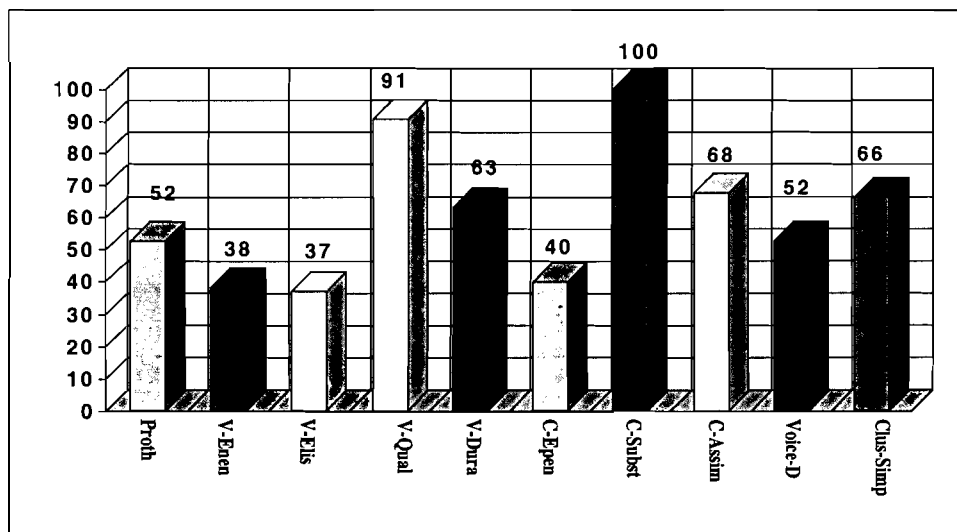

Figure 1: **Phonological Processes in the Frozen IL of Spanish speakers**

The same is valid for consonant cluster reduction and synaeresis or vowel elision corresponding to the macro-process of subtraction or deletion, an extremely widespread syllable structure processes in L1 acquisition. Equally common in the phonology of Spanish children are substitution processes such as vowel substitution, consonant substitution, voicing/devoicing and consonant assimilation found in the IL of our informants. In the following pages we shall discuss the nature of the ten processes in order to see whether there is a systematic phonological relationship between the learners' IL and their L1 (Spanish) or, on the contrary, whether there are other factors of a universal nature that impinge on the learner's output.

III.3.a. Prothesis

Vowel insertion is analysed here under two headings depending on whether insertion takes place initially in the syllable and medially; in the first case we talk about prothesis, being the second instances of epenthesis[21].

Let us consider prothesis first.

Table l a : Prothesis

ILFORMS	TLFORMS	PROTH.	IL FORMS	TLFORMS	PROTH
I.			**II.**		
			a)		
[es'tei]	[steɪ]	e	[di(e) 'splendid]	[da 'splendɪd]	ø/e
[es'lip]	[sliːp]	e	[tu(e) 'spend]	[ta spend]	ø/e
[es'pein]	[spein]	e	[tu (e) 'slip]	[tu 'sliːp]	ø/e
[es'peʃiali]	['speʃli]	e	['beri(e) s'peʃal]	['veri 'speʃl]	ole
[es'pendiŋ]	['spendɪŋ]	e	[tu (e)'stop]	[ta 'stɒp]	ø/e
[es'pik]	[spiːk]	e	['beri 'streins]	['veri 'strerndg]	ø
[es'plendid]	['splendid]	e	[a spor]	[a spɔːt]	o
[es'tʌdi]	['stʌdi]	e	**b)**		
[es'tand]	[stænd]	e	[seim es'kuːl]	['seim 'skuːl]	e
[es'treins]	['streɪndʒ]	e	[mʌtʃ es'tʌdi]	[mʌtʃ 'stʌdi]	e
			[wɒs es'teiiŋ]	[wəs ‿'steiiŋ]	e
			[ɪs es'treins]	[ɪs ‿'strein(d)ʒ]	e
			[wɒs es'pikiŋ]	[wəs ‿spiːkiŋ]	e

A glance at the samples above reveals interesting issues from an implicational viewpoint and more in particular from the Universal Canonical Syllable Stmcture (UCSS). According to Vennemann (1988), a canonical syllable is defined as a stmcture consisting of a single C as an optimal onset, a nucleus stmcture, and a cero coda. In terms of sonority, the nucleus is considered the most sonorous component of the syllabic stmcture, followed by onsets ranked in sonority from the first to the last in an increasing order, markedness increasing with the length of onsets and codas (Clements, 1990).

It has been hypothesised (Sato, 1984; Tarone, 1987; Riney, 1990) that there is auniversal tendency to reduce complex syllabic margins —considered more marked— to more simple, unmarked ones, and also to produce open CV syllables because of their unmarked character. Jakobson (1949) was the first to point out this fact on the grounds that CV is the only syllabic pattern found in all languages and the first that children learn even in languages with other syllabic structures. Such naturalness is captured by Eckman's Interlanguage Structural Conformity Hypothesis (ISCH) which predicts that "the universal generalisations that hold for the primary languages hold also for interlanguages" (1991: 24). The preference for the simple open syllable should, therefore, be evident in the IL of FL adult learners. Confirmation of this goes back to Tarone's study when she reported that her informants broke the English SCC cluster into "simple CV patterns" (1980: 142).

The opposite trend, i.e. the violation of the CV universal tendency, has been found in studies where Spanish subjects were involved (Tropf, 1987; Carlisle, 1991; Carlisle, 1999). It is well documented that Spanish[22] is reluctant to onsets beginning with S+CC, a typical word

initial syllable English onset, and that Spanish syllable structure conditions require a vowel insertion rule whereby $O \rightarrow e$ / # __ sCC, the extrasyllabic consonant /s/ becoming coda to the new syllable. Carlisle (1999) is one of the few who have studied the IL of Spanish learners of English in order to analyse epenthesis among other things. He regards this phenomenon as "nearly the sole means that Spanish NSs use to modify /sC(C / onsets" (1999: 75) considering it in terms of onset modification and the effect of the environment. Ours being a descriptive study based on free speech samples, we are not in a position to adhere or not to the ISCH in the sense that frequency of modification is onset-length dependent, rather we shall discuss prosodic resyllabification or syllabic dynamic shift typical of casual speech.

The prothetic process is generally acknowledged to be language specific and, therefore, part of the phonological competence of all Spanish speakers irrespective of their provenance. But despite being considered in the literature an important syllable modification process, 47.69 % of our informants did not resort to it at all. This being the case, we cannot talk of the primacy of vowel epenthesis as a key process in IL phonology as Oller (1974) claimed. All the evidence is that prothesis is govemed by L1 syllabic constraints rather than by processes showing a tendency towards a universal open syllable as we shall discuss below.

Table 1b: **Prothesis**

Num. Errors	Frequency	%
0	31	**47.69**
1	29	44.62
2	3	4.62
3	2	3.08

A glance at Table 1a shows certain facts that are worth discussing. We notice in the second part of this Table a list of forms environmentally conditioned where a prothetic vowel appears as either a compulsory (block b) or as an optional element (block a). Obligatory prothesis takes place whenever the Spanish learner is confronted with a word ending in consonant followed by another consonant acting as head of the following word. When this happens, there is resyllabificationn, the coda consonant becoming head of the new syllable with the prothetic vowel as nucleus and the onset consonant acting as coda (e.g. *[wɒ.ses.piː.kɪŋ]). This resyllabification across word boundaries is an overriding feature of the initial IL of adult Spanish speakers who transfer the Spanish pattem of consonantal resyllabification within and across word boundaries whenever a single consonant is flanked by vowels. Prothesis is so strong in these cases that is triggered off even in instances where identical[23] sibilants intervene, as in /wɒs steɪɪŋ/ realised as *[wɒ.ses.teɪ.ɪŋ] when one might expect *[wɒs.teɪ.ɪŋ], with fusion of the two sibilants into a single one followed by prosodic resyllabification. This rule accounts for identical syllabification of othenvise different underlying structures as in *las salas* (the rooms) vs *las alas* (the wings) both realised as /la.sa.las/ unless a pause is introduced after the first sibilant.

A different case occurs in the **presence** of vowels. As Table 1a, block a) illustrates, prothesis is a facultative phenornenon whenever an onset is preceded by a vocalic elernent. Not with all vowels certainly, since English disallows rnost short vowels in final position, but the ones allowed word finally might attract the first elernent of a word initial S+CC English cluster. As a result, /s/ becornes coda to a syllable whose nucleus is not a prothetic vowel but the final vowel of the preceding word as reflected in [tus.'pend] or [tus.'lip]. And yet, the sarne expressions can be heard (they were heard) with a prothetic vowel (*[twes.pend], *[twes.lip], etc.). It is difficult to tell which of the two options rnay prevail, as both are the reflection of two apparently contradictory Spanish processes: vowel insertion and vowel füsion. Prothesis is likely to occur in contexts where onsets beginning by S+C are preceded by a vowel, all elernents being uttered at a rnoderate, andante speed. The opposite happens in free, rapid colloquial speech. In this context, vowel reduction is noticeably strong whenever simple one-mernber onset syllables are followed by checked, onset-less syllables. A nurnber of fusion mles apply whereby some vowels —high and low in particular— attract weaker vowels. Colloquial forms like *yastán* (for y a están), *tústas* (for tu estás) *casistuve* (for casi estuve), etc., are a reflection of those mles. It so happens that /e/ appears to be the weakest of all vowels in Castilian Spanish (Monroy, 1980: 73). So when confronted with a sequence like ['veri s'peʃl], the Spanish learner can resort to two different phonological processes: (s)he rnay insert aprothetic elernent after a preceding vowel (e.g. ['ve.ri.es.'peʃl]) as a result of hiatus (i.e. pause), slow speech or even orthographic influence; alternatively, (s)he may resyllabify (['ve.ris.'peʃl]), extrasyllabic /s/ acting as coda to the preceding syllable either because the preceding vowel serves as nucleus of the newly-formed syllable or because this new syllable is the result of the conflation of two underlying nuclei, one of them with prothetic /e/. The fact that /e/ is elided in the vicinity of another vowel, provides an explanation for the surface prothesis-free IL forms.

To conclude, this insertion process used by 52.31% of our informants does not appear to be consistent with irnplicational universals in one irnportant respect: that open syllables are less rnarked than closed syllables[24] as the ernergence of a prothetic vowel followed by coda clearly reveals. The fact that all instances in our data reverse this tendency, showing total preference for a closed syllable rather than an open one, appears to be a clear argument against the universality of this process. This is all the more surprising if we consider that Spanish shows a strong tendency towards the open syllable as pointed out above.

*III.3.*b. Vocalic epenthesis

Although closely related to prothesis, we discuss vowel epenthesis separately on the grounds that it has different surface rnanifestations. Unlike prothesis, /e/ is not the only vocalic elernent inserted, /o/ and /a/ and, occasionally /i/ can also rnake their appearance, although /e/ is the rnost

likely candidate (see Table 2a).

Table 2a: **Vowel epenthesis**

IL FORMS	TL FORMS	EPENTH	IL FORMS	TL FORMS	EPENTH
[a'nojed]	[ə'nɔɪd]	e	['ordinari]	['ɔːdɳri]	/i/a
['dident]	['dɪdɳt]	e	['oupen]	['əʊpɳ]	e
['garden]	['gɑːdɳ]	e	['person]	['pɜːsɳ]	o
['hazent]	['haezpt]	e	['prison]	['prɪzɳ]	o
['havent]	['hævɳt]	e	['sadenli]	['sʌdɳlɪ]	e
[inte'restig]	['ɪntrəstɪŋ]	e	['teribol]	['terəbl̩]	o
['kuden]	['kʊdɳt]	e	[frai ten]	['fraɪtɳ]	e
['hospital]	['hɒsprɪtl̩]	a			
['midel]	['mɪdl̩]	e			

Looking at these forms in terms of the UCSS we notice that there are cases which clearly abide by it, but they seem to be the exception rather than the rule. A word like ['ɔːdɳri], appears realised as *['ordinari], with epenthesis of /i/ and /a/ thus breaking the negative syllable-structure conditions of /dn/ into two canonical CV syllables. Cwiously enough, the same process is not applied in the case of ['sʌdɳlɪ] where only one epenthetic element is introduced. Here resyllabification applies forming a closed syllable (['sa.den.li]) instead of the expected CVCV structure (i.e ['sa.de.ne.li]). Interestingly, a word like [inte'restiŋ] has an epenthetic vowel betweeen /t/ and /r/, despite the fact that /tr/ is a perfectly admissible Spanish onset as a word like *entraste* (you went in) testifies. And yet, the sequence is resolved as a CV CV. One could argue that this was expected as it conforms to the UCSS and markedness relationships whereby open syllables are less marked than closed syllables, something that should have a reflection in the IL of the FL learner. Counter-evidence, however, comes from the rest of the examples in Table 2a where no single case of vocalic epenthesis occurs in final position. The result is that all English words with a two-member coda are realised as closed syllables with an epenthetic nucleus, its quality depending on orthographic (['hospital], ['person]) or perceptual similarity (['garden] ['teribol]). More strikingly, a single epenthetic vowel is inserted even in cases of final three-member codas as reflected in the following forms: ['dident], ['hazent], ['havent], etc.

Table 2b: **Vowel epenthesis**

Num. Errors	Frequency	%
0	40	61.53
1	17	26.16
2	6	9.23
3	2	3.08

Non-word initial vocalic epenthesis did not appear to be an ovemding syllable rnodification process; in fact 38.47% of the sample resorted to it. Cluster splitting took place breaking the TL pattem CVCCC (hasn't) into CV#CVCC. While the first syllable seerns to adhere to UCSS, the three-consonant coda did not split into three open syllables (*ha.se.ne.te) as UCSS predicts. Besides, these and similar examples provide little support to the alleged prirnacy of vowel epenthesis as a key process in IL phonology. All the evidence is that epenthesis is govemed by L1 syllable constraints rather than by processes showing a tendency towards a universal open syllable. The only variability found was the optional dropping of the final consonant, but not a single instance was found of a CV realisation with the final consonants in the output of our informants.

A further conclusion that follows frorn these samples is that vowel epenthesis is not a phenornenon restricted to onset and environmental constraints (Carlisle, 1999). Syllabic codas seern to play an important role too, a role that needs to be further investigated in order to see whether they are more powerful than environmental or onset variable constraints.

*III.***3.**c. Vowel elision (synaeresis)

We cover under this name those instances of vowel supression that take place rnedially in a word, synaeresis being the rhetorical narne to refer to medial elision of vowels in ordinary speech[25]

Table 3a: **Vowel elision (synaeresis)**

Num. Errors	Frequency	%
0	41	63.08
1	15	23.08
2	5	7.69
3	4	6.15

Vowel elision —a reflection of the rnacro-process of reduction — has not attracted rnuch attention in IL literature. This rnay be due to the little irnpact it has had in contrastive studies where not rnany examples rnay be found and also to its elusive character which rnakes it difficult to handle it in contexts other than casual speech, its natural habitat. In free, casual conversation, it is a very frequent phenornenon both in English and Spanish. In the former, vowel elision affects the schwa basically (Girnson & Cruttenden, 2001: 287), while in Spanish vowels enter into a dorninance relationship where sorne rnay disappear in the presence of other stronger elernents (Monroy, 1980, ch.4). Vowel elision is at its highest in colloquial Spanish whenever two identical vowel segments co-occur, particularly if they are unstressed (e.g. /kopera'tiba/ for 'cooperativa') or a stressed syllable is followed by an unstressed one or vice versa (e.g. /al'kol/ for 'alcohol'). This fusion of two contiguous vowels belonging to different syllables, called synaeresis, is a potent phonetic phenornenon in Spanish both within and across word boundaries[26]

Table 3b: Vowel elision (synaeresis)

IL FORMS	TL FORMS	SUBST
['djaðer]	[ðɪ 'ʌðə]	ɪ'ʌ→ja
[in'dʒɔiŋ]	[ɪn'dʒɔɪŋ]	ɪɪ→ɪ/i
[fraiq]	['fraɪŋ]	ɪɪ→ɪ/ɪ
[kraɪŋ]	['kraɪŋ]	ɪɪ →ɪ/i
[pleɪŋ]	['pleɪŋ]	ɪɪ →ɪ/i
['rjaliti]	['rɪ'æləti]	ɪ'æ→ja
[steɪŋ]	['steɪŋ]	ɪɪ →i/i

The IL forms recorded in Table 3a evince a process that affects **37%** of our participants and seems to be a reflection of the learners' L1 influence. The syllabic structure CV(V) # VC is resyllabified as CVVC as shown in [fraiq], [kraɪŋ], [pleɪŋ], etc., with elision of one of the two identical segments and the merging of the two nuclei into a single nucleus. Synaeresis affects contiguous identical vowels belonging to different syllables, particularly if they are nouns (e.g. *azahar=azar*)[27]. In the case of verbal forms (e.g. *pasé-pasee-paseé*) where paradigmatic oppositions intervene, vowel elision can optionally occur. It is not surprising, therefore, that most of the IL forms recorded in Table 3b should instantiate synaeresis. Synaeresis too, underlies the pronunciation of reality as ['rja.li.ti]. Unlike English, which disallows /ɪ + ae/ as a diphthongal sequence, Spanish conflates the two nuclei into one, the high vowel becoming a semivowel that combines with the low vowel yielding the opening sequence /ja/.

Contiguous non-identical vowels across word boundaries (synaloepha) are also amenable to vowel fusion in Spanish the result being a non-canonical syllable CVC if the second conflated syllable is checked (e.g. *ya están* = [jas.'tan])[28]. In Table 3b there is an instance that exhibits this pattern but for the coda which is lacking: [dja.ðer]. The mechanism used —syllable fusion by weakening the unstressed, high vowel— is identical with that found in the case of non-dipthongal sequences as seen in our reality example.

Although examples are not abundant, we have again evidence that a process like synaeresis (an also synaloepha) yield a language-specific syllabic string that violates the UCSS. Far from keeping the initial open syllable apart from the following one by hiatus or a semivocalic element, a number of our participants resorted to synaeresis which involves the conflation of both syllables into a single closed syllable, a process fully operative in their L1.

111.3.d. Vowel substitution (quality)

Substitution processes appeared in consonants as well as in vowel forms. We decided to group them into two sections, discussing here problems related to quality dealing with duration in the next section.

Table 4a: **Vowel substitution (quality)**

IL FORMS	TL FORMS	SUBST	ILFORMS	TL FORMS	SUBST
['famili]	['fzmali]	z—a	['onli]	['aunli]	au—o
[flat]	[flæt]	z—a	[hol]	[haul]	au—o
[ai kan]	[aɪ 'kæn]	z—a	[no]	[nəʊ]	au—o
['mʌner]	['mzna]	z—a	['kloθis]	['klaübz]	au—o
[polisman]	[pə'li:smən]	ə →a	['sirjas]	['sɪərɪəs]	ɪə→ i
[a'nɔid]	[a'nɔɪd]	ə →a	['serjus]		ɪə→ju
['(h)ospital]	['hɒspɪtəl]	ə →a	[e(k)'spirjens]	[ɪk'spɪərɪəns]	ɪə→ i
[a'naðar]	[ə'nʌðə]	ə →a			ɪə→je
			[tu'geber]	[ta'geba]	a—u
['basinis]	['bɪznəs]	ɪ→a	['marβelus]	['mɑ:vələs]	a—u
		a—i	[tu 'gou]	[ta 'gəʊ]	a—u
[de]	[ðə]	a —e	[su'pouz]	[sa'pauz]	a—u
[e'genst]	[a'genst]	a —e	['difikult]	['dɪfɪkəlt]	a—u
['gabered]	['gæðəd]	a —e			
['proβlem]	['prɒbləm]	a —e	[an'tidi]	[ʌn'taɪdi]	aɪ→i
			['bridggrum]	['braɪdgru:m]	ar—i
[for'get]	[fa'get]	a —o	['oriθon]	[ha'raizp]	aɪ→i
[polisman]	[pə'li:smən]	a —o			
['prison]	['prɪzən]	a —o	['flowers]	['flaüaz]	aua— owe
['oriθon]	[hə'raɪzn]	a →o			
['faʃion]	['fæʃ(ə)n]	a—io	[a'fred]	[a'freid]	er—e
[tele'βision]	['telɪvɪʒ(ə)n]	a—io	['sandai]	['sʌnd(e)ɪ]	eɪ→aɪ
[es'korsion]	[ɪk'skɜ:ʃ(ə)n]	a—io	['adgensi]	['eɪdʒənsi]	ei—a
			['dandger]	['deɪndʒə]	ei—a
['broðer]	['brʌðə]	ʌ →o			
[non]	[nʌn]	ʌ →o	[si'tweiʃon]	[sɪtju'eɪʃn]	u'ei— wei
[kom]	[kʌm]	ʌ →o	[a'prisjeit]	[ə'pri:ʃi'eɪt]	i'eɪ→jei
[blod]	[blʌd]	ʌ →o			
			[pro'maist]	['prɒmɪst]	ɪ→aɪ
['famili]	['fæməli]	a—i	[eks'prest]	[ɪk'sprest]	ɪ—e
			['voises]	['vɔɪsɪz]	r—e
['forenes]	['fɒrɪ/ənəz]	ɪ/ə→e			
			[a'peard]	[ə'pɪəd]	la—ea
['mena]	['mænə]	æ→e	['realaizd]	['rɪəlaɪzd]	~a— ea
['proyram]	['prəʊgræm]	æ→a	[es'pirjens]	[ɪk'spɪərɪəns]	ɪə→i/ ie
['ambjulans]	['æmbjuləns]	æ→a	[ka'rear]	[kə'rɪə]	ɪə→eə
			['dguswali]	['ju:ʒʊəli]	ua—ua
			['puar]	[pʊə]	ua—ua
			[skuar]	[skwea]	ea—ua
			['parents]	['pearants]	ea—a
			['kerful]	['keaful]	ea—e

It is a well-known fact that adult learners of a foreign language have difficulty in achieving a native-like level of accuracy with individual sounds. Phonological competence involves the mastery of FL phonetic categories in such a way that the learner's output falls within the perceptual latitude acknowledged by native speakers as typical of their own system. This does not preclude the existence of an accent, something that all speakers of a given language have one way or another. but rather that any accent is not recognised as 'foreign' by native speakers. Syllable nuclei production is precisely one of the key elernents which indicate the learner's level of rnastery of the TL forms.

In the early days of CA, one basic tenet was that learning "sounds that are physically similar to those of the native language, that structure sirnilarly to thern and that are sirnilarly distributed [...] occurs by simple transfer without difficulty" (Lado, 1957: 12). Contrary to this viewpoint, Oller and Ziahosseiny (1970) claimed that similar sounds between NL and TL are harder to learn than dissimilar sounds on the grounds that dissimilarities are rnuch more noticeable than sirnilarities. Flege's study (1987b) gave support to this view following identical line of argument: that different or new sounds are easier to learn because learners are much more aware of the differences while they rnay merge the phonetic properties of native and target language sounds inaccurately perceived as equivalent. And Major & Kim (1999) formulated the Similarity Differential Rate Hypothesis (SDRH) which predicts not just that similar sounds are more difficult to acquire than dissimilar sounds, but that a dissirnilar phenomenon is acquired faster than a similar one. Since our data do not reflect rate of acquisition we cannot test this aspect of the hypothesis[29], so let us focus, therefore, on Major's contention about degree of difficulty involved in the learning of similar / dissimilar sounds and other aspects of his Ontogeny Model.

As Table 4b reveals, only 9.23% of the sample reflected learners' cornpetence in this particular process. All the rest characterised by varying degrees of fossilisation that basically affected three monophthongs and rnost diphthongs (see Table 4a). Schwa happened to be the most frequently substituted rnonophthongal element, which was replaced by /a/ ([po'lisman]), by /o/ (initial syllable of previous example), by /e/ ([de], the), by /i/ (['faemili]) and by /io/ ([tele'βision]). /o/ was substituted for /ʌ/ in a few cases ([kom], [blod], etc.). More common was the substitution of /a/ for /æ/ ([aɪ kan], ['proyrarn], etc.) and, occasionally, for /e/ (['rnena] - manner). Diphthongal substitution was fairly comrnon and affected rnost diphthongs. Thus, /aɪ/ happened to be replaced by /i/ (['oriθon]), /eɪ/ by /e/ or /a/ ([a'fred], ['dandger]) , /ɪə/ by /ea/ ([a'peard]), /ʊə/ by /ua/ (['puar] - *poor*) and /əʊ/ by /o/ (['onli]).

Table 4b: Vowel substitution (quality)

Num. Errors	Frequency	%
0	6	9.23
1	19	29.23
2	28	43.08
3	8	12.31
4	4	6.15

The first issue to address is to see whether fossilised language reflects a higher level of competence with dissimilar sounds compared with similar ones. Major and Kim (1999) corroborate this hypothesis on the grounds that begiming and advanced leamers produced /dʒ/, the similar sound, more accurately than the dissimilar sound /z/. The case of adult leamers with frozen IL is different. They are not begimers, for they have studied English for a period of time, and they are not advanced leamers either. They belong to that vague category of people whose language is, in Corder's words, 'comfortably (?) intelligible'. But before we proceed, let us first clarify what we mean by 'similar' and 'dissimilar' sounds. When Major and Kim state that "similar sounds are more difficult to acquire than dissimilar sounds" (1999: 159) they are relying on two abstract concepts that are never operationalised. Similarity is a very elusive construct as it may be defined from a visual, acoustic, articulatory or cognitive standpoint. Besides, it is a concept that cannot be easily ascribed to two dichotomous linguistic poles, as there are degrees of similarity depending on whether phonological, phonetic and graphemic aspects are taken into account. A word like person, could be considered very similar to the Spanish persona. The question is similarity on what grounds? Orthographically speaking, they are identical but for the final segment. Phonologically though, they only share three phonemes (/p, s, n/ —British pronunciation), two of which (/s, n/) hold different phonotactic restrictions from their Spanish equivalents. The vocalic element in /pɜː-/ is totally different (vowels in general are virtually always different across languages due to their unique articulatory settings). And if we look at the phonetic shape of both strings, we will discover that there is not a single element in common: /p/ is aspirated in initial position in English, unlike Spanish; /s/ is more apico-alveolar than the equivalent in Castilian standard, and the syllabic character of English /n/ makes it phonologically different from Spanish /n/. The concept of similarity (and the same applies to dissimilarity) needs, therefore, further qualification. Major is undoubtedly aware of this deficiency when he states that "Although the role of similarity and dissimilarity seems well documented and convincing [...] what constitutes similar and dissimilar is not always clear" (1999: 156).

Indeed it is not. One could argue that /æ/ substitutions for /a/ are based on a certain degree of similarity between the two sounds and that, as a result of this, Spanish leamers find more difficult to pronounce it correctly than /ə/ for instance, a sound totally foreign to Spanish phonology. Experience does confirm that /æ/ is a problematic phoneme for most Spanish leamers, due no doubt to the fact that Spanish /a/ may cover most of the phonemic space allocated in English to /æ/, /ʌ/ and /aː/; negative transfer can then be evoqued to explain the nonlearning of /æ/. But /ə/ tums out to be just as difficult a phoneme as /æ/ as evinced by the different substitutions made by our participants (see Table 4a). Such substitutions, typical of the learning process for dissimilar sounds, should progressively approach the TL, the stages being, in Major's opinion (1995), similar or identical to those happening if L1 acquisition.

One wonders about the usefulness of the similarity/dissimilarity distinction in an area characterised by continuity rather than polarity and where sound identity is practically non-existent. We expressed above our doubts about the usefulness of similarity /dissimilarity as a criterion to

provide a plausible explanation to frozen IL. In acquiring a FL one is faced with an inventory of sounds at varying degrees of acoustic distance depending on their distnbution. Perceptually though, during the initial stages, they are all ascnbed to the phonetic categories the leamer already possesses. In this sense they present different degrees of similarity depending on specific contexts. Thus word final /ə/ resembles Spanish /a/ more closely than when checked by a velar consonant (e.g *again*). Depending on the individual's perceptual abilities, some leamers will be aware of certain acoustic differences while others will not. As perception govems production, the less capable leamer will not be able to produce sounds other than those he is familiar with: those of his mother tongue with which he identifies the TL sounds. The more capable leamer will be in a position to hit the target unless articulatory or neuro-biological constraints intervene.

If similar sounds are more difficult to acquire than dissimilar ones (excepting true beginners), it follows that the frozen IL of the adult FL leamer should have a higher mastery of dissimilar forms than of similar ones. However, as reflected in Table 4a, dissimilar sounds such as /æ/, /ə/ and all English centring diphthongs pose problems to 90.77% of the participants while 'similar' sounds such as /e/, /i/, /ʌ/, etc., do not appear as problematic. One possible explanation is, no doubt, the methodology used. While focusing on one specific phoneme position (Major and Kim, 1999) may be revealing, results cannot be extrapolated to cover the leamer's behaviour with other phoneme distributional variants. English /e/ is supposedly very similar to Spanish /e/ if we compare Spanish *sed* with English *said*. But English /e/ is not so similar when it occurs checked by /l/ where the vowel becomes much more open than its Spanish equivalent. In spite of this, does this mean that the acquisition of /e/ is much more difficult than that of, say /ə/? Two points need clanfication before answering this question. We have, firstly, to know what is meant by 'more difficult' —a variable that remains undefined. Do we interpret it in terms of rate of acquisition as Major's SDRH? Ideally, a longitudinal analysis of individual leamers would show us whether or not this is the case. But then, what is the level of proficiency required? Native-like accuracy is beyond the scope of most adult leamers, so we would have to agree on a lower proficiency level to see if leamers have spent more time leaming similar than dissimilar sounds. The other point is the leamer's expenence with the language. Any language leamer needs a nurnber of instantiations (Leather, 1999) of the different phonetic contrasts in order to establish the corresponding sound boundaries in the TL. Sounds considered more difficult tend to be practised much more than those apparently more similar. Needless to say that similarity is not to be equated with identity, but it is closer to the basic intelligibility level than dissimilar sounds, therefore it is not surprising that more time should be spent practising new sounds than more familiar ones. This would explain why FL leamers seem to be at a disadvantage with similar sounds: the number of instantiations would be far less than the time spent with dissimilar sounds. So it seems to me that it is amount of exposure and not degree of similarity that might explain the apparent counter-intuitive claim that similar sounds are harder to acquire than dissimilar ones.

The polar opposition 'similar-dissimilar' introduces another important dimension. Sounds considered similar have supposedly some L1 equivalent forms that are responsible for positive

transfer, unlike dissimilar sounds that have no L1 equivalence. In terms of Major's Ontogeny Model (1987) similar sounds would be the result of L1 influence whereas dissimilar ones would be due to developmental (i.e. universal) tendencies. Our data do not reflect substitution processes that may not be traced back to the learners' L1. If we look at diphthongs, L1 influence is clear in cases like ['oriθon] (horizon), ['adʒensi] (agency), /aɪ/ and /eɪ/ being replaced by /i/ —most probably due to spelling influence, a factor extremely influential with adults who have acquired their FL in a formal setting. Centring diphthongs, however, are unfamiliar sounds to Spanish speakers, and yet far from reflecting universal constraints, they were all rendered by the Spanish sounds perceived as closest to the target forms. All this leads us to think that a great deal of research is needed to clarify what we mean by similarity between two sounds and upon which criteria cross-language similarity judgements are based.

*III.***3.**e. Vowel substitution (duration)

As pointed out above, we decided to split up the vowel substitution macro-process into the processes of vowel quality and vowel quantity. Most of what has been said about the former is valid for the latter, but duration introduces a new perspective that needs to be discussed.

Vowel duration is a feature as typical of RP English as it is unknown in Spanish, hence its importance in analysing the role that universal factors may play in FL acquisition. We shall begin with Major's Ontogeny Model (1987) which hinges precisely on the interrelationship of transfer and universal processes. As seen above, the influence of transfer is considered strong during the initial stages of learning but later on it is superseded by developmental factors which progressively increase and finally decrease.

Table 5a: **Vowel substitution (duration)**

IL FORMS	TLFORMS	SUBST	L FORMS	TLFORMS	SUBST
['oful]	['ɔːfəl]	ɔː→o	[past]	[pɑːst]	ɑː→a /ʌ
[banin]	[bɜːnɪŋ]	ɜː→a/ʌ	['person]	[pɜːsn̩]	ɜː→e
[es'kursjon]	[ɪk'skɜːʃn]	ɜː→u	['servant]	['sɜːvənt]	ɜː→e
['kasel]	['kɑːsl̩]	ɑː→a/ʌ	[es'port]	[spɔːt]	ɔː→o
['faðer]	['fɑːðə]	ɑː→a/ʌ	[tern]	[tɜːn]	ɜː→e
[fest]	[fɜːst]	3:→e	[tok]	[tɔːk]	ɔː→o
['fornitʃer]	['fɜːnɪtʃə]	3:→o	[to'wars]	[təˈwɔːdz]	ɔː→a
['garden]	['gɑːdn̩]	ɑː→a/ʌ	[words]	[wɜːdz]	ɜː→o
['gel frend]	['gɜːl frend]	3:→e	[workin]	['wɜːkɪŋ]	ɜː→o
[haf]	[hɑːf]	aː→a /ʌ	[west]	[wɜːst]	ɜː→e
['horsis]	['hɔːsɪz]	3:→o	['woter]	['wɔːtə]	ɔː→o
			[θerd]	[θɜːd]	ɜː→e

Both types of process have been widely reported within an L2 context. Eckman (1981) and Flege and Davidian (1985) have found evidence for Spanish that there are processes that are not attributable to the learner's NL. Vowel duration is an interesting area of study to see whether the IL

behaviour of Spanish speakers confirms their findings. Spanish differs in this respect from English (RP variety) quite markedly. While duration is distinctive in RP English establishing two different types of monophthongs, long vs short, in Spanish length is an optional element with no distinctive value in the system (Monroy, 1980). The closest to a durational effect is found in cases like *azahar* or *alcohol,* with two identical vowels combining their respective values, but, as pointed out above when synaeresis was discussed, they may be freely reduced in colloquial speech to the value of a single vowel so that *azahar* (orange blossom) can be homophonous with *azar* (chance). Length is therefore non-distinctive in Spanish. On the other hand, the tendency towards vowel compresion is fairly strong in colloquial Castilian and is responsible for most cases of synaeresis and synaloepha in the language. But again, it is non-distinctive as nucleus-lengthening in some South American varieties (e.g. Argentinian) testifies. And yet, duration is a potential area of difficulty for Spanish speakers. A glance at Table 5b clearly reveals that more than half of the sample (63.08%) failed to use it correctly.

Table *5b:* Vowel substitution (duration)

Num. Errors	Frequency	%
0	24	36.92
1	20	30.76
2	14	21.54
3	2	3.08
4	5	7.69

Following Major's OM hypothesis, one would expect interference to playa major role during the early stages of learning; also because "is more likely in colloquial speech"(Major, 1987: 219) which is what we have analysed. The recorded IL forms in Table 5b do reflect instances of interference with no trace of developmental errors. The leamers substituted the long vowels /ɔ:/-/ɑ:/-/ɜ:/ for Spanish /o/-/a/ in the first two cases, and in the case of schwa for Spanish /e/, /o/ or /a/ depending on the environment. Under no circumstances did developmental errors make their appearance, which is all the more surprising considering that the leamers' NL does not exert specific constraints on length. Moreover, Spanish is usually considered a syllable-time language and, unlike stress-timed languages, 'vowel reduction is much less prevalent' according to Major (1987: 218) . So one wonders why there is no trace of developmental errors in our informants. A possible answer might be that frozenness has occurred before the onset of universal processes so that only interference is present, but Major's model envisages the presence from the start of both types ofprocess with L1 processes prevailing over —not surpressing— developmental ones.

The conclusion then is that as far as vowel duration is concerned, the frozen IL of our Spanish informants does not reflect processes other than those that mould their L1.

III.3.f. Consonant insertion (epenthesis)

This process ranked low in the IL of our participants: only 35% (see Table 6b) failed to produce the phonetic forms of the TL correctly. We shall be focusing on onsets and codas modification in order to see, once again, the possible effect of interference and developmental processes, and the conformity of the resulting syllables to the UCSS.

Table 6a: Consonantal insertion (epenthesis)

ILFORMS	TLFORMS	EPENTH	ILFORMS	TLFORMS	EPENTH
[ai ˈɣwos]	[aɪ waz]	g	[in ˈdis ˈɣweɪ]	[ɪn ˈðɪs weɪ]	g
[anderstan]	[ʌndəˈstænd]	r	[tolk]	[tɔːk]	l
[ag gwen...]	[an wen...]	g	[ˈordinari]	[ˈɔːdɲri]	r
[ˈdeg gwi...]	[ˈBen wɪ...]	g	[ˈperson]	[ˈpɜːsn̩]	r
[ˈderti]	[ˈdɜːti]	r	[ˈsʌmgwan]	[ˈsʌmwʌn]	g
[ˈdogter]	[ˈdɔːtə]	g	[ˈservan]	[ˈsɜːvənt]	r
[ˈenti]	[ˈempti]	P	[toˈwars]	[təˈwɔːdz]	r
[ˈfaðer]	[ˈfɑːðə]	r	[ˈwɒtər ɣwos]	[ˈwɒtə waz]	r
[ferst]	[fɜːst]	r	[gweg ˈgwos..]	[wen waz]	g
[for mi]	[fa miː]	r	[ɪs gwers]	[wɜːst]	g
[ˈgarðen]	[ˈgɑːdn̩]	r	[ˈworkig]	[ˈwɜːkɪŋ]	r
[ˈhorsis]	[ˈhɔːsɪz]	r			

Consonantal epenthesis affected /g/ and /r/ and only marginally /l/. One thing that stands out from our sample is the fact that apparently only one-member onsets are amenable to modification. Such modification would consist of inserting /g/ as an epenthetic consonant initially in a word, the resulting sequence conforming to the UCSS in terms of sonority. A closer examination reveals that the underlying phonetic facts are much more complex. Unlike English, Spanish /w/ is word initially not a consonant, but the first element of a diphthong (eg. /ˈweko/ -hueco (gap)), and as such it may be preceded by a single coda (/ˈgwapa/ -guapa *(pretty))*. The interesting thing is that the epenthetic consonant /g/ can only be inserted across word boundaries, and only if /w/ is preceded by a consonant —particularly if nasals and liquids are present, but not exclusively (haz hueco -leave room). So the function of consonantal epenthesis here is not to "make syllabifiable unsyllabifiable sequences" (Carlisle, 1999: 69), which is not the case for the two are perfectly syllabifiable, but to avoid a syllabification which if abiding by the canonical syllable would contravene a phonotactic rule whereby a consonant flanked by vowels syllabifies with the following one. Here is how this apparently paradoxical situation originates:

1.   la huerta /la ˈwer.ta/ (the orchard) with the syllable string[30] CV# wVC# CV
2.   un huerto /u.nwer.to/ (an orchard)—after applying a resyllabifiction rule whereby a consonant between vowels syllabifies with the following vowel as in *ar.bol-*

ar.bo.les (tree- trees). As this syllabification is not allowed by the system, new resyllabification takes place yielding

3. un huerto /un.gwer.to/ with epenthesis of /g/ (the system disallows the linkage of a single consonant with word initial /we/).

All Spanish vowels are in fact eligible as syllable nucleus devoid of both onset and coda, but /u/ is the one which more restnctions presents. Unlike the rest of the monopththongs, it cannot occur on its own across word boundaries unless followed by /o/ (e.g. uno u otro). In these circumstances, ambisyllabicity occurs, /u/ optionally syllabifying with the preceding /o/ (u.*nou.o.*tro) or with the following /o/ (*u.no.uo.tro*) or, if hiatus intervenes, it may constitute a separate, margins-less syllable (*u.no.u.o.tro*). Thus, while Spanish allows *un.nue.vo* (a new...) and /uŋ gwe.βo/ *(un* huevo -an egg) it disallows the stnng /u.nwe.βo/ as the correct syllabification for *an* egg. One might consider velarization of a preceding /n/ to be responsible for the presence of /g/ —a widespread tendency in colloquial Castilian. But the fact that /g/ is also inserted after a vowel (e.g./'kar.nei.gwe.bos/ *meat* and eggs) as a reinforcer of /we/, disallows such an interpretation. It rather seems that epenthetic /g/ is introduced by a phonological rule that prevents the dynamic shift of the intervocalic consonant with the opening dipththong /we/, and to a lesser extent with /wi/[31] (Monroy, 1980, ch. V). The phenomenon is so widespread that a phonetician like Malmberg (1965) posited a labio-velar phoneme /gw/ for Spanish (1965: 54-55).

This process of velar epenthesis was fairly fiequent (40 %, see Table 6b) in the IL samples of our informants, expressions like [ag gwen...], ['deg gwi...], [ai ywos] etc., being mirror image of similar sequences in Spanish. It provides further support for Carlisle' s contention (1999) —which he only applies to vowels — that environment exerts a strong influence on the fiequency with which epenthesis occurs word initially. The question that remains to be answered is the extent to which epenthesis in Spanish is more or less fiequent before vowels compared with consonants.

Table 6b: **Consonant insertion (epenthesis)**

Num. Errors	Frequency	%
O	39	60.00
1	14	21.54
2	8	12.31
3	42	6.15

Epenthesis in coda position was restncted to the presence of /r/. Spelling played, apparently, an important role here, for being RP a non-rhotic accent there were several examples where our informants pronounced /r/ in medial, closed syllables in the Spanish way. It is a well known fact that adult Spanish speakers are perceptually and in terms of production more at ease with rhotic than with non-rhotic varieties of English due precisely to the closer relationship between spelling and pronunciation in non-rhotic accents. Spelling influence appears to be so strong that it nullifies the effect that UCSS might exert on such syllables. Thus words like person, garden, *dirty,* talk, etc.,

were pronounced with epenthesis of /r/ (and the last one of /l/) in coda position instead of abiding by the universal canonical syllable structure. This, no doubt, runs counter to the 'natural' preference for open syllables posited by Tarone (1980).

III.3.g. Consonant substitution

The consonant substitution process appeared to be the most powerful in IL development. As shown in Table 7b, all subjects made mistakes of this type, its frequency of occurrence reaching in one case 80% of an individual's sample. 18.46 % incurred in up to four mistakes of consonant substitution, this process being particularly active in syllable initial position and, above all, between vowels. It was less operative in word final position, apart from voicing that shall be discussed below. Liquids, nasals and sibilants in particularly were the segments more amenable to undergo substitution, but in a way that differs from the behaviour found in L1 learners.[32] Consonant change seems to us particularly revealing in the open syllable issue. Clearly the alleged universal preference for a CV syllable type was not borne out. Very significantly, our data reveal that when confronted with an unfamiliar single coda, subjects opted for substituting a familiar phoneme for it rather than suppressing the unfamiliar one as one might expect.

Table 7a: **Consonant substitution**

ILFORMS	TLFORMS	SUBST	IL FORMS	TLFORMS	SUBST
[a'ɣou]	[ə'gəu]	9—ɣ	['nes deil]	['neks deɪ]	d→ð
[an den...]	[an den...]	d→ð	[o'keison]	[ə'keɪʃn]	ʃ→s
[aŋ gwi...]	[an wi:...]	n→ŋ	['orins]	['ɒrɪndʒ]	dʒ→s
[deθ]	[ded]	d→θ	['proβlens]	['prɒbləmz]	m→n
['eβriβoɗi]	['evribɒdi]	v→β	['proyram]	['praugrzm]	9—ɣ
		b→β	['reiðjeu]	['reidiau]	d→ð
		d→ð	['reinin]	['reɪnɪŋ]	ŋ→n
			['sambodi]	['sambadi]	d→ð
[es'treins]	[strerndg]	dg—s	[sen'seison]	[sen'seɪʃn]	ʃ→s
['βeri 'βiɣ]	['veri bɪg]	v→β	['serβan]	['sɜ:vənt]	v+b
		b→β	['ʃautin]	['ʃautɪŋ]	ŋ→n
['beri]	[veri]	v—b	[tain]	[taɪm]	m→n
['fraitenin]	['fraɪtənɪŋ]	ŋ→n	['traβel]	['trævl]	v—b
['goβermen]	['gavnmant]	v→β	['trajedi]	['trzdgadi]	dʒ→ɲ
['haβent]	['hævnt]	v→β	[tu 'du]	[tu du:]	d→ð
[ha'weβer]	[hau'eva]	v→β	[tu 'ɣou]	[ta 'gəu]	9—ɣ
['igglis]	['ɪŋglɪʃ]	ʃ→s	[tu'yeder]	[ta'geda]	g→ɣ
[job]	[dʒɒb]	dʒ→ɲ	[wɒsen dear]	[wɒznt dea]	ð→d
			[wil 'βi]	[wil 'bi:]	b→β
['ju:suali]	['ju:ʒuəli]	ʒ→s			
['mornin]	['mɔ:nɪŋ]	ŋ→n			
[a'pier]	[a'prad]	d+r			

Substitutions represent another good basis for checking Major's hypothesis and see whether they are the result of transfer from Spanish phonology (for instance, use of alveolar fricative /s/ for the

palato-alveolar /ʃ/), developmental, or TL forms which the learner has already acquired. A look at Table 7a reveals that substitutions took place within as well as across word boundaries. The use of [β] for [v] was the most common substitution among our participants (8 tokens) followed by the use of [b] for [d] (7 tokens). This 'everybody effect' is so entrenched in the IL of adult Spanish speakers that it is perhaps one of the more lasting interference features and one that best reveals the Spanish origin of the learner. The replacement affects voiced plosives [b,d,g] which are rendered as their corresponding fricatives [β,ð,ɣ] when flanked by vowels, a key substitution phenomenon in Spanish phonology. Also, as Spanish lacks the opposition voiced/ voiceless found in the case of English labio-dentals /v, f/, /v/ is substituted by [β] too as shown below

CONSONANT SUBSTITUTION		
/b/	/d/	/g/
↓	↓	↓
/v/ ⟶ [β]	[ð]	[ɣ]
/m/	/n/	/ŋ/
↓	↓	↓
[n]	[ŋ]	[n]

Nasals too enter into an interplay of substitutions where perhaps the most remarkable are the use of /ŋ/ for /n/ (as in /aŋ gwi.../) and, conversely, the use of /n/ for /ŋ/ (as in /ˈfraitenin/).

Transfer is apparent in the replacement of /m/ by /n/ as in /tain/ (time), Spanish being reluctant to have a bilabial nasal finally in a word with the exception of álbum (generally pronounced *álbun)*. The realization of /ŋ/ as /n/ (e.g. /ˈʃautin/) obeys identical phonotactic constraints —although a number of speakers habitually use the velar variety on all occasions (Monroy, 1980: 193). The use of /ŋ/ for /n/ is context dependent: any following velar will trigger off the velarization of a preceding nasal both within and across word boundaries. All nasal substitutions therefore involved transfer processes.

As stated above, fricativization of voiced plosives was highest with /d/ (7 tokens), followed by /g/ and /b/. Environrnent is a crucial factor here too. English labio-dentals underwent substitution processes depending on their place in the utterance. Thus, /ˈberi/ maintained the plosive value due to its position of initial segment preceded by pause or nasal consonant. The latter was responsible for the non-fricativization of /d/ in [an den..] or [ˈwɒsen dear]. Otherwise, they were all systematically replaced by their corresponding fricative values as in [ˈβeri βiɣ], [tuˈɣeðer], etc.

Looking at these facts from a MDH perspective, we observe that substitutions affect basically nasals and voiced fricatives. It appears that within the nasal group /n/ is the least rnarked elernent, followed by /m/ and [ŋ]. The replacernent of /m/ for /n/ and of [ŋ] for /n/ are correctly predicted by the hypothesis, but this is not the case of /n/ for [ŋ] where the latter is the more marked elernent. It is true that one possible explanation might be that for a number of Spanish speakers both [n] and [ŋ] are in free variation word finally, but markedness relations do not envisage such a possibility as they do not show identity of features: while both elements share the feature [+nasal], /n/ unlike /ŋ/ is [+coronal] and [-back]. Therefore, this does not provide us with a valid explanation. And the same holds for the voiced obstruents /b, d, g/. The theory of markedness predicts that once the nasal-oral distinction applies, place of articulation follows. As the intervening voiced pairs share identical point of articulation features, it is manner that differentiates them. The rnarking conventions specify that plosives are less rnarked than their corresponding fricatives so they should not be replaced as the latter are rnarked for the feature [+continuant]. This replacement is context dependent though, for it only takes place when voiced plosives are flanked by vowels. Thus the markedness hypothesis does not seem to make the correct prediction in terrns of directionality since both consonant types are functional in Spanish. It does predict that the markedness value for [-continuant] is ignored between vowels.

Table 7b: Consonant substitution

Num. Errors	Frequency	%
0	0	0.0
1	9	13.85
2	19	29.23
3	14	21.54
4	12	18.46
5	6	9.23
6	2	3.08
7	1	1.54
8	2	3.08

A third group of substitutions involved English palato-alveolars /ʃ, ʒ/ and voiced affricate /dʒ/. The three are foreign phonemes to Spanish leamers and have the feature sibilance in common, a feature shared by Spanish /s/. The IL forrns of our informants reflected this fact. Accordingly, the three English phonernes were replaced by Spanish /s/ (e.g. ['juːsuali], [o'keison], ['orins] *(usually, occasion, orange).* On only one occasion *(tragedy)* was /J/ substituted for /dʒ/, friction prevailing over stridency. All these phenornena are an indication that transfer frorn the learners' L1 was overriding since no substitutions were found that could be considered developrnental in nature.

This has interesting irnplications for Major's OM (1987b, 1999) according to which transfer errors will decrease while developmental increase and then finally decrease. The IL of our participants was plagued with errors, but sorne of thern far from being developmental, which is what

one would expect after the long exposure to English of all the informants, were clearly due to transfer. Major's model does predict the learner's course of development from the initial stages to a final stage when the learner can produce target-like utterances, both processes intervening in varying degrees in the shaping of the learner's IL, but the model fails to account for incomplete attainment as in our case. It would be interesting to know which of the two prevail in frozen speech in order to gauge how far off IL is from the target forms. This failure to spot developmental processes in the substitutions of our informants is all the more surprising when one considers that Major (1999) has supported the claim for the presence of both processes analysing the IL of four adult beginners for a period of just eight weeks (1999: 133), which markedly contrasts with the ten years' exposure of our participants. One might be tempted to consider developmental the presence of consonant clusters in final position like the ones found in [es'treɪns] or [job] on the grounds that they do not occur finally in a word. Their presence, however, as Spanish syllabic codas (e.g. *ins.truir,* objeto, etc.) disqualifies them as manifestations of a purely developmental process.

*III.3.*h. Consonant assimilation

Another type of substitution process whose presence in the IL of our informants was fairly significant (67.69% made mistakes linked to this process, see Table 8b) was consonant assimilation, a process in FL acquisition which has not been much studied as Macken & Ferguson acknowledge (1981). Although its effect is more noticeable at word boundaries, it was also found word internally reflecting in both cases language-specific rules. In English assimilation processes are "usually regressive, involving a variation in the place of articulation" (Gimson-Cruttenden, 1994: 259). In Spanish, too, assimilation is usually regressive and affects place of articulation.

Table 8a: **Consonant assimilation**

IL FORMS	TLFORMS	ASSIM	IL FORMS	TL FORMS	ASSIM
[aɪ 'θɪn dat...]	[aɪ 'θɪŋk dat...]	n̲ d	[aŋ gwen...]	[an wen...]	ŋ̲ g
['enti]	['empti]	n̲ t	[aiŋ goig...]	[aɪm gəʊɪŋ...]	ŋ̲ g
[diden nou]	[dɪdnt nau]	n̲ n	[deg gwi...]	[den wi...]	ŋ̲ g
[an den]	[an den]	n̲ d	[aŋ gwi...]	[an wi...]	ŋ̲ g
[in 'dis gwei]	[ɪn dis wei]	n̲ d			
['orin juːs]	['prɪndʒ dʒuːs]	n̲ ʝ	[nes samer]	['nekst 'sʌmə]	s̲ s
['prɒblens]	['prɒbləmz]	n̲ s	[ai 'doun θin sou]	[aɪ 'dəun θɪŋk sau]	n̲ s
[hinselfl]	[hɪm'self]	n̲ s			

A glance at Table 8a, shows, however, that both types of process are present in the learners' speech reflecting, once again, the influence of the informants' L1. Thus in the first IL column we come across some instances of progressive assimilation such as [an den] (and then) or [aɪ 'θɪn dat...],

where /ð/ (then, that) undergoes assimilation to the place of articulation of the preceding nasal. This is a reflection of a Spanish syllabic rule whereby voiced plosives become fricatives when preceded by consonants other than nasals (e.g. [sin.du.ða] -*without* any *doubt* vs [la.ðu.ða]. The remaining examples are instances of regressive assimilation: ['prɒblens], [nes samer], etc. The IL forms [aŋ gwen...], [deg gwi...] constitute typical cases of velar reinforcement as seen above which trigger off the assimilation of the preceding nasal to an identical point of articulation as the first element of the following word.

Table 8b: Consonant assimilation

Num. Errors	Frequency	%
0	21	32.31
1	23	35.38
2	15	23.08
3	6	9.23

III.3.i. Voicing/devoicing

Voicing/ devoicing , applied here to phonologically contrastive units sharing an identical point of articulation, appears to be a widespread phenomenon in the IL of our informants. As a varieiy of consonant assimilation, this process had a moderately high frequency of occurrence per subject: nearly half of the sample (47.69%) produced target-like forms while the rest of the subjects made one or more mistakes (see Table 9b).

Table 9a: Voicing/devoicing

ILFORMS	TL FORMS	vID	IL FORMS	TLFORMS	V/D
[faif]	[faɪv]	v →f	[ek'sampel]	[ɪg'zɑːmpl]	gz→ks
[ɒf]	[əv]	v →f	[ek'sam]	[ɪg'zæm]	gz→ks
['bisnis]	['brznas]	z →s	[es'treins]	['strerndg]	dʒ→ns
[wos]	[wəz]	z →s	['hostitgis]	['hɒstɪdʒɪz]	dʒ→tʃ
[bi'kos]	[bɪ'kɒz]	z →s			z →s
[noisis]	['nɔɪzɪz]	z →s	['marritʃ]	['mærɪdʒ]	dʒ→tʃ
['hɔrsis]	['hɔːsɪz]	z →s			
[gels]	[gɜːlz]	z →s	['jusuali]	['juːʒuəli]	ʒ →s

Various studies have focused on sound replacements of Spanish leamers of English as a FL (Michaels, 1974; Hammerly, 1982) where voice has been approached as part of the general process

of sound substitution. That sound substitution —and voicing /devoicing in particular— is far from being an arbitrary choice is clear from the data presented in Table 9a. In all the words listed, the feature [-voice] is maintained in cases where the TL demands a [+voice] realization. By applying Echan's MDH (1987) and his Structural Conformity Hypothesis (1991), we see in the first place that the difference between English and Spanish fricatives lies here in the presence of a voice contrast in English which is not functional in Spanish. The hypothesis predicts an area of difficulty word initially that increases directionally to word medial and word final sibilant fricatives, the last ones occupying the most marked position (Echan, 1987). For a Spanish speaker this would represent, therefore, an increasing difficulty in the mastery of the voice contrast from initial to final position.

Table 9b: **Voicing/devoicing**

Num. Errors	Frequency	%
0	31	47.69
1	18	27.70
2	10	15.38
3	5	7.69
4	1	1.54

Although our data do not reflect the three possibilities (there were no samples with a voice contrast word initially or word medially), experience tells us that Spanish speakers find word initial voice contrast as difficult to master as in medial or final position. Eckman (1987) mentions that initial voice contrasts 'should not be difficult' for English speakers learning French /ʃ-ʒ/. As such contrasts do exist word medially in English, it may have a facilitating effect that is totally absent in the case of Spanish speakers where the language lacks (sibilant) voice contrasts in any position[33]. In our teaching experience, English word initial voice contrast (as in zed – *said*) represents a degree of difficulty for our students as high as word medially or word finally. Target-like voice forms may no doubt be obtained in any position through proper training, but, to our knowledge, no one has quantified the amount of time needed to master such contrasts so that we cannot confidently state that Spanish learners of English acquire them in a particular direction.

       Resort to first language acquisition does not seem to confirm directionality in terms of typological markedness. Thus in the empirical study on Spanish acquisition carried out by Hemández-Pina (1984) in which she systematically analysed her child's output from zero to three years, the first sibilant recorded occurred in word final position (*papas* = food) at fourteen months. A word initial sibilant appeared at sixteen months (sol= sun) and in medial position at seventeen months (*oso*=bear). Curiously enough, at eighteen months Rafael did not pronounce /s/ either word initially ([téta] *silleta*=small chair) or word medially ([kitá] cristal= glass) or word finally ([paaβa], paraguas =umbrella). The correct pronunciation of these forms occurred at a later stage with the following ordering: paraguas (19 months), cristal (23 months), silleta (24 months) (1984: 174-175).

Quite independently of the backsliding effect or the non-linear progression of these examples, such behaviour seems to contravene typological markedness in the sense that it does not bear out a parallelism between first and second/foreign language acquisition. There is no reason to believe that a Spanish-speaking learner will follow this order and make such errors learning a foreign language. Among other reasons, because the MDH does predict frequency of errors but not *types* of errors. All we can say is that the MDH predicts that voice errors are L1 dependent to the extent that the difference between L1 and TL in terms of voicing is marked in English whereas there is no such contrast in Spanish. In our data at least, the resulting errors are clearly due to interference in all cases. If typological markedness is a measure of degree of difficulty as it is claimed, English word final voice sibilants should be acquired at a later stage than, say, word medial or word initial voice contrasts. Admittedly, this cannot be guessed from the examples in Table 9a which reflect frozen IL forms at a given stage, but other procedures would also be fraught with difficulties as there is no way of knowing how many instantiations the learner has been exposed to before mastering a particular contrast.

III.3.j. Cluster simplification

In a paper published in 1974, Oller reflected on the L2/FL literature concluding that while epenthesis was a favoured strategy for FL/L2 learners, consonant deletion was favoured for L1 learners. Independently of the validity of his assertion that epenthesis occurs frequently in L2/FL speech (denied by Sato, 1987), consonant deletion happens to be a common process in the IL of Spanish adult learners. That and epenthesis constitute the main processes responsible for cluster modification. In this section we shall be looking at consonant simplification both in syllable onset[34] and coda positions from a markedness perspective. Anomalous clusters (asterisked in the Table below) will be briefly discussed within the framework of Optimality Theory.

Deletion was the third and final macro-process appearing in the IL of our participants. As reflected in Table 10b, 33.85% of the students made no mistakes in cluster reduction. The remaining 66.15% were reductions that affected word final consonants due to the fact that Spanish allows syllable final but not word final clusters.

Since the irruption of universal theories, coda simplification has been the subject of a number of studies in an attempt to show how IL consonant patterns reflect universal tendencies. One serious problem that speakers of Spanish face when learning English as a FL is the mastery of English codas due to their degree of complexity. Whereas RP English displays 116 consonant word final consonant clusters (Gimson-Cruttenden, 2001: 240-43), Spanish only allows four single consonants in that position: /n, s, l, r/. These consonants are, moreover, potentially ambisyllabic in the sense that they become heads the moment a vowel follows either within a word or across word boundaries.

Table 10a: **Cluster simplification (apocope)**

IL FORMS	TL FORMS	APOC.	IL FORMS	TL FORMS	APOC
[ai doun θin sou]	[daunt θɪŋk sau]	t/k	['hapen]	['hæpənd]	d
['aksiden]	['æksɪdənt]	t	['hazent]	['hæznt]	*
[a'rraif]	[a'rarvd]	d	['havent]	['hzvnt]	*
[a:s(k)]	[ɑːskt]	t	[hɪnself]	[hɪm'self]	*
['darnes]	['dɑːknəs]	k	[im'portan]	[ɪm'pɔːtənt]	t
[dres]	[drest]	t	[is'perjens]	[ɪk'spɪərɪəns]	k
['difikul]	['dɪfɪkəlt]	t	[rs gwers]	[ɪz wɜːst]	t
['enti]	['emptr]	P	[jas]	[dʒʌst]	t
[e(k)'spirjens]	[ɪk'spɪərɪəns]	k	[las]	[lɑːst]	t
[es'prest]	[ik'sprest]	k	[lif]	[lɪrvd]	d
[e'gens]	[a'genst]	t	[nai]	[nart]	t
[es'pen]	[spent]	t	[nes]	[nekst]	k
[es'perimen]	[ɪk'sperɪmənt]	t	['ones]	['ɒnɪst]	t
[es'port]	[spɔːt]	d	['orins]	['ɒrɪndʒ]	*
[es'tand]	[stznd]	*	['pregnan]	['pregnant]	t
[es'treins]	['streɪndʒ]	*	['proβlens]	['prɒbləmz]	*
['flowers]	['flauaz]	*	['servan]	['sɜːvənt]	t
[frens]	[frendz]	d	[tern]	[tɜːn]	*
[for 'istans]	[far 'ɪnstəns]	n	[tok]	[tɔːk]	*
[gels]	[gels]	*	[ʃort]	[ʃɔːt]	
[ges]	[gests]	t	[to'wars]	[tə'wɔːdz]	d
			['wen 'houm]	['went..]	t
			[work]	[wɜːk]	*
			[wors]	[wɜːdz]	d

A glance at Table 10a shows a number of syllabic modifications that deserve a comment. Cluster simplification is most evident after /n/ plus /t/ and, less frequently, /d/ or /k/, especially in word final position as in [ai doun θin sou] or ['aksiden]. This confirms Anderson's study (1987) who also found that /t, d/ were the consonants most often deleted by her informants[35]. /t/ deletion extends to cases where an obstruent follows /l/ (e.g. ['difikul]) or /s/ (e.g. [las] (lasr), [lif] (liveú). Obstruents were systematically deleted in syllabic codas beginning with /s/ as in [dres] (*dressed*) —and more drastically in [nes] (nexr). In all these instances the resort to a deletion process —never to epenthesis— was evident to adapt TL forms to conform to a native language structure. This could be explained as a reflection of an L1 Consonant Deletion Rule whereby occurrences of sibilant plus plosive are realised with the dropping of the plosive. But this cannot be extended to other two-consonant clusters: there are a number of instances that did not undergo such simplification strategy. Eckman's markedness hypothesis (1987: 152) establishes that three-consonant clusters are more marked that two-consonant clusters, that fricative+stop is less marked than stop+stop and that fricative+stop (or vice versa) is less marked than fricative +fricative. He further claims that cluster reduction follows a predictable pattern. Thus we would expect cluster reduction to apply to a word Iike next [kst] to yield a fricative + stop sequence ([sk —unlikely for a Spanish speaker— o vice versa ks]) rather than the more marked fricative +fricative [ss]. The drastic reduction to a one-

consonant coda [s] would support E c h a n ' s hypothesis in that a fricative and not a stop is maintained as the former is more marked than the latter. The same is valid for *guests*, pronounced [ges]. An altemative pronunciation would surely introduce a stop ([gest]) but it seems more unlikely to hear [gets] as a simplified form for *guests*, surely due to the sonority hierarchy which predicts that fricatives are more sonorous than plosives.

Now if we look at clusters consisting of liquid plus /s/ (*girls, flowers*) or /r/ plus /k, t/ (work, short) we notice that they were not simplified to L1 pattems by any of our informants. Nor were codas consisting of /n/ plus /s/ (e.g. [e(k)'spirjens]). Are these two-consonant codas obeying any universal principle whereby nasals and liquids followed by fricative are not amenable to further reduction (I have never heard Spaniards saying [gis] for *girls* or [experies] for experience)? A possible suggestion could be to explain coda maintenance in cases like these in terms of sonority as information potential (Ohala & Kawasaki, 1997). The main idea is that segments can occur together provided that each other do not mask the acoustic signals that constitute their informational potential. It is usually acknowledged that [s] has an anomalous behaviour. It has the capacity to appear in unexpected contexts and it may violate phonotactic and sonority restrictions. On the other hand, it is auditorily a specially perceptible sibilant (Laver, 1994: 260). [n] and [l] characterise by a high sonority too. Their combination with [s] produces a strong contrast, occasionally strengthened by the introduction of an intrusive [t] by same native speakers of English (e.g. [ɪk'spɪəriənts]) due to its stop character. As to [r], Laver (1994: 297-299) includes it together with the semivowels. Perhaps the mixed nature of approximants and their radical difference with obstruents would justify its capacity to combine with [t, k].

Table *10b*: Cluster simplification (apocope)

Num. Errors	Freq uency	Y₀
0	22	33.85
1	20	30.77
2	18	27.69
3	4	6.15
4	1	1.54

The pronunciation of an otherwise impossible L1 sequence consisting of liquid plus sibilant or liquid plus obstruent could be explained as instances of developmental forms in Major's model if not of orthographic influence (spelling pronunciation) considering the strong association that adult learners establish between spelling and pronunciation. This explains the IL forms with /r/ in coda position despite the non-rhotic character of RP. But there is not a ready explanation within E c h a n ' s model as to why cluster reduction is not fulfilled in these and other cases where /r/, and to a lesser extent /l/, are not simplified to a one-member coda (e.g. work, short). One thing is certain though: that they do not correspond to any similar underlying cluster in Spanish. Only in the case of /n/ +/s/ one could argue that they do exist word medially in this language, although such realization is linked to

stylistic considerations: in formal speech both segments are fully pronounced (e.g. *ins.tin.to*) whereas /n/ is dropped in casual speech *(is.tin.to)* —which is what we find in the first syllable of instance in our sample. However, our informants pronounced both consonantal elements with no reduction. This could be a simple case of phonological mastery due to practice if not a manifestation of orthographic mimetism. Another possible explanation might be to consider those word endings as samples of an internal syllable stmcture within a larger stmctural pattem (e.g. for instance to come....) in which case the phonological realisation of /n+s/ would accommodate to the word non-final pattern already seen. It could be argued that if this was the case, one might come across realisations of instance as *[ínstan] or *[ínstas] in parallel with the pronunciation [ˈɪns--] / [ˈɪs--] found in our informants. As this did not materialise, and experience confirms that these are not likely IL forms for Spanish speakers, it may well be a case of developmental substitution, although again one cannot lose sight of the fact that the cluster is not totally foreign to the Spanish leamer.

   The case of obstment deletion is different. By resorting to this process, the learner transforms an othenvise illicit coda into a perfectly acceptable L1 structure. From an Optimality Theory (OT) perspective, the lack of obstruents in word final position derives from constraints acting on surface representations, constraints such as (a) the bamng of obstruents in word final position (NO OBS WF), (b) maximization of consonants in the input (MAX (C)), and (c) input dependence of the vowels in the output (DEP (V)). The first constraint restricts more marked forms whereas b) and c) are faithfulness constraints in that they establish a correspondence between input, or underlying representation, and output. Both are linked by a universal function called EVAL, which compares input and output an assigns faithfulness violation marks. Optimality Theory has to provide an answer as to which of the surface representations is optimal according to the constraint ranking operating in a given language.

   There is a problem however with NO-OBS-CODA constraint used by Broselow, Cheng and Wang (1998) for it would exclude *all* obstruents from coda position when all we want in fact is to exclude just those from word final position. The simper solution would be to posit an ad hoc NO-OBS-WF constraint (no obstruents word finally). This applies, unlike NO-CODA-OBS (*et.nia, at.mós.fe.ra*, etc), to all words except a few linguistic loans like pub, club, so it would not make much sense that the learners would obey NO-CODA-OBS. Markedness universals would justify the ranking position of NO-OBS-WF. However, it is reasonable to assume than an FL learner starts not from a neutral ranking constraint but from the one assumed by his/her L1. It is immaterial within OT though to discuss whether the suppression factor is universal or L1 related as it is related to both. Prince & Tesar (1999) hold the view that when acquinng an L1 there is an innate tendency to avoid markedness constraints degradation (like NO-OBS-WF) below faithfulness (like MAX and DEP). That is, there is an innate tendency to avoid the acquisition of unnecessarily marked forms. The fact that NO-OBS-WF is not violated in Spanish has two sources: one, universal (it is a markedness constraint and occupies, therefore, the top of the ranking provided this is not changed in the opposite direction); the other is L1 specific (that the leamer has not acquired any word that has led him to downgrade NO-OBS-WF below MAX and DEP). Any decision as to whether suppression is due

to L1 influence or to universal factors evolves around either choice between action (the universal tendency to place NO-OBS-WF high in the ranking) or omission (the fact that Spanish does not alter such configuration).

Thus if an input contains a voiceless stop word finally, **as** in accident, we cannot satisfy constraint a) without being unfaithful to the input (/'æksɪdənt/); the surface form without the final stop (['æksɪdən]), though, violates constraint b). Another possibility could be to introduce an epenthetic vowel at the end (['æksɪdənte]), but this would violate c) which penalises the addition of vowels. The form chosen by the speaker will depend on which constraint is more highly ranked and therefore stronger in his/her IL. Thus while the native speaker of English will rank b) and c) higher than a), a Spanish leamer of English who pronounces *accident* as ['aksiden] with /t/ deletion, is ranking a) higher than b) and c) **as** illustrated below

/'æksɪdənt/	NO OBS WF	DEP (V)	MAX (C)
a. 'æksɪdənt	*!		
☞ b. 'aksiden			*
c. 'æksɪdənte		*!	

We see then that OT does not envisage language-specific rules: GEN supplies a number of possible surface forms that correspond neither to the NL nor the TL and that incorporate universal processes such as deletion, substitution, epenthesis, etc. All the leamer has to do is to check which of the surface forms best satisfies the set of universal constraints **as** they are ranked in his/her language. Of the two basic processes that might reflect the universal function GEN deletion and epenthesis— the former tumed out be more cornmon (66.15%, see Table 10b) than the latter (49.23%, see Table 2b). These results contradict Broselow, Chen & Wang (1998) and their claims about the *emergence of* the *unmarked* in second language phonology. In their paper they claimed that, given that faithfulness had to be violated, leamers chose the least marked unfaithful forms. Under the label 'WD-BIN' they seem to encapsulate three basic metncal constraints: i) FT-BIN: "Feet are binary under moraic or syllabic analysis" (Kager 1999: 156); ii) GRWD=PRWD: "A grammatical word must be a prosodic word" (Kager 1999: 152); and iii) PARSE-SYL: 'Syllables are parsed by feet' (Kager 1999: 153). Surprisingly, epenthesis is a far better choice from the markedness viewpoint: ['æksɪdənte] can be analysed **as** a prosodic word with two feet [('æksɪ)(dənte)] so that FT-BIN, GRWD=PRWD and PARSE-SYL are respected. Let us see in tableau format how epenthesis would win if the emergence of the unrnarked took place:

/'æksɪdənt/	FT-BIN	GRWD=PRWD	PARSE-SYL
☞ a. ('æksɪ)(dənte)			
b. ('æksɪ)(dən)	*!		
c. ('æksɪ)(dən)			*!
d. ('æksɪdən)	*!		

The deletion of the obstruent is consistent with the high ranking of NO-OBS-WF, but it does not reduce metrical markedness. We are left with a three-syllable word that cannot possibly be optimally parsed into feet. Either we violate FT-BIN by creating a foot that consists of three syllables or leave one syllable metrically unparsed, thus violating PARSE-SYL. Other constraints will have to be considered to account for the fact that, in spite of increased markedness, deletion is the preferred option.

Reality, though, is much more complicated that this sketchy analysis may lead one to think. The fact that 33.85 % of our informants produced all forms correctly, and in the case of epenthesis, half of the sample did not make any mistakes at all, requires an explanation that involves the reranking of constraints. But it is interesting to know the prevailing type of ranking in the frozen IL of FL leamers.

IV. CONCLUSIONS

In this paper I have presented and analysed some basic patters of the frozen IL of adult Spanish leamers of English. The study of their oral output has yielded ten fundamental phonological processes shaping their IL which ultimately are reflections of the three universal macro-processes of addition, subtraction and substitution. In our study, consonant substitution errors tumed out to be the hardest to eradicate (100%), closely followed by vowel quality (80%). At the other end of the scale, synaeresis or vowel elision, vowel epenthesis and consonant epenthesis ranked lowest (37%, 38% and 40% respectively). Middle range values corresponded to prothesis and voicing/devoicinig (both 52.31%), vowel substitution (duration) (63%), cluster simplification (66%) and consonant assimilation (68%). No specific acquisition order is claimed for such processes in the sense that one may deduce a universal ranking order for them.

I have discussed each of them in tum providing evidence of the degree of phonological dependence of such processes on L1 phonotactic pattems. Thus, prothesis is analysed under the light of the universal canonical syllable or tendency to reduce complex syllabic structures to an unmarked CV pattem as predicted by Tarone (1980) among others. Far from confirming such a tendency, our data increase the number of studies, mainly those in which Spanish subjects were involved, that report the violation of the CV universal pattem. But this needs some qualification, while aprothetic vowel is a compulsory element whenever the previous word ends in a consonant, in full agreement with the Spanish pattem of consonant resyllabification, a prothetic vowel is not so critical if the final element of the preceding word is itself a vowel. In these circumstances, the Spanish learner may optionally introduce prothetic /e/, particularly in slow speech or because of hiatus. Altematively, (s)he may resyllabify with extrasyllabic /s/ acting as coda. In either case the resulting pattem is not the allegedly universal CV but a CVC structure despite the fact that Spanish is characterised by a strong preference for the open syllable.

Violation of the canonical CV syllabic structure is also evident in most instances of vowel insertion (epenthesis) in word medial and word final position. Unlike prothesis where /e/ was the only allowed vowel, here we come across some instances with epenthetic /o/ and occasionally /i/ or /a/. While some examples did abide by the universal canonical syllable in word medial position alternating with samples that did not, violation of the CV pattern was systematic in word final position, even in cases of three-consonant codas. These examples provide little support for the alleged primacy of epenthesis as a key process in the IL phonology.

Not much attention has been paid to synaeresis in the IL literature, due no doubt to is low occurrence in other than casual speech. Even here it was the phonological process with least incidence in our data as pointed out above. And yet it is a relatively frequent phenomenon in English, although it affects schwa basically, and a very frequent one in Spanish. The IL forms recorded were mostly instances of elision of identical vowels. The resulting resyllabified syllable structure with the conflation of the two nuclei into one (CVC) is a clear manifestation of a powerful L1 process which again violates the universal canonical syllable in that it shows preference for a closed syllable instead of keeping the CVV# VC pattern.

Substitution of one vocalic segment for another is a common process both in L1 and FL acquisition. It has usually been invoked in support of the interaction of developmental and transfer processes. We have drawn a distinction between substitutions affecting vowel quality and those affecting vowel quantity. Qualitatively speaking, vowel substitutions ranked very high. Substitutions in general are a good example to test both Major's Similarity/Dissimilarity Hypothesis, according to which dissimilar sounds are more successfully mastered than similar sounds, and Major and Kim's Similarity Differential Rate Hypothesis which predicts that dissimilar sounds are acquired faster than similar ones. To begin with, we argue against the similarity/dissimilarity distinction on the grounds that it is a very elusive dichotomy since it needs to be fully operationalised if it is going to have any real value as a criterion to provide a convincing explanation of frozen IL. Moreover, the similarity/dissimilarity distinction rests on the individual's perceptual target, heavily influenced by the learner's L1 phonemic structure, which in turn governs production. It also seems to rest to a variable degree on orthographic mimetism, particularly in the case of vowels. Our data certainly did not reflect the fact that dissimilar sounds were easier to learn than similar ones, nor that the former were acquired faster than the latter. Should this be otherwise, the frozen IL of our informants would have shown a higher mastery of dissimilar than similar vowel forms as reflected in the acquisition of, say, schwa vs /æ/. This did not materialise. A related issue refers to the role played by transfer vs. developmental processes in the acquisition of vowel quality. Positive transfer was expected in the case of similar sounds whereas dissimilar sounds were supposed to be due to developmental tendencies. Since all substitution processes were related to the learners' L1, there is no room for such dichotomy as far as this phonological process is concerned.

Vowel substitution in terms of duration was also analysed in the light of Major's Ontogeny Model in order to see the impact of transfer and developmental processes. Vowels

being length non-distinctive in Spanish, and L1 therefore not exerting any specific constraints on length, one would expect to find little difficulty here for the Spanish learner. However, it tumed out to be a problematic area for 63% of our informants. As in the case of vowel quality substitutions, far from seeing IL as a competition of interference and developmental processes, no trace of the latter was found. English long vowels were in all cases systematically replaced by those Spanish monophthongs whose values were considered more closely related to the target language forms.

Under consonant insertion we argue that the function of consonant epenthesis, when occurring across word boundaries, is not to make unsyllabifiable sequences syllabifiable but to avoid a syllabification that, although faithful to the universal canonical syllable, would contravene a powerful Spanish phonotactic rule whereby single consonants between vowels syllabify with the following vowel. Medially and finally in a word, consonant epenthesis was restricted to /r/ despite the fact that RP is not a rhotic accent. Apparently L1 syllable structure coupled with spelling influence seem to counteract the universal tendency to form open syllables.

Consonant substitution was the most powerful process shaping the IL phonology of our informants for all of them made errors of this type. From such errors we discover the reluctance of Spanish speakers to eliminate unfamiliar single codas and produce a canonical CV pattern. Instead they all resorted to consonant substitution replacing the unknown sound with a familiar one. Consonant substitution also has a bearing on Major's hypothesis in that it can be used to see wether the sounds involved are the result of transfer or of a developmental nature. Not a single case was found that could not be explained by resorting to the learners' L1. Consonant substitution affected basically English voiced plosives and nasals. The former underwent fricativization whenever they occurred between vowels. This 'everybody effect' was most powerful when flanked by vowels and it was at his highest with /d/. Nasals were also susceptible to substitutions, /m/ being replaced by /n/, /n/ by [ŋ] and vice versa depending on the specific environment. It is important to note those substitution processes —and the same goes for consonant assimilation— did not reflect anything but L1 transfer. As to Major's hypothesis that transfer errors will decrease while developmental increase and then finally decrease nothing of this was found in the IL of our informants. Admittedly, frozen IL does not reflect the final stage of mastery in language acquisition, but some kind of developmental errors should be evident at any IL non-initial stage. Substitutions are, moreover, a good case to test Eckman's MDH. If less marked elements are supposedly acquired before more marked ones, one would expect to find voiced plosives rather than the corresponding voiced fricatives in the learners' output since the former are less marked than the latter. True, the presence of voiced fricatives (more marked) implies the presence of voiced plosives (less marked) and both are present in Spanish, but the hypothesis ignores the role of environment which constrains the presence of the less marked element in Spanish and, as a result of transfer, in English. Neither does this behaviour adhere to Eckman's Structural Conformity Hypothesis which predicts that less marked elements (voiced

plosives in our case) are easier to acquire than more marked ones (voiced fricatives). Fricativization stubbomly remains as a prominent feature of our leamers despite the presence of voiced plosives in their L1.

We approached voicing/devoicing in the light of Eckman's typological markedness that predicts an increasing difficulty in the mastery of voice contrasts from word initial to word final position. While our data only capture word final voice problems encountered by the Spanish leamers, it is not clear that the difficulties are greater here than in any other position of the word. Evidence from Spanish child language does not seem to support directionality as claimed by Eckman, nor does our experience reveal that learners are better off acquiring word initial than word final voice contrasts. Be this as it may, the resulting errors were all L1-dependent where, unlike English, no voice contrasts occur.

Eckman's markedness hypothesis was also applied to the final process, cluster simplification, in order to see to what extent cluster reduction followed a predictable pattern. It was found that Eckman's prediction is fulfilled in encounters of stop+ fricative +stop, the cluster being reduced to the less marked string of stop **+** fricative and ultimately to a fricative. But this is not the case with clusters where the first element is a liquid **+** /s/ *(flowers)* or /r/ +/k,t/ **(work)** which were never simplified to an L1 pattem by none of our informants. Spelling pronunciation has no doubt a lot to do with this, and also some insights may be gained from Optimality Theory as it is briefly discussed.

In summary, unlike much research which considers that adult leamers of a foreign language do not always produce foreign sounds which have a clear counterpart in their native language, the results presented here show that, as far as adult Spanish speakers are concemed, it is not clear that processes represent universal constraints unequivocally. Rather it appears that L1 exerts an overriding role in the acquisition of the phonology of English as a foreign language as reflected in the majority of the processes under analysis.

NOTES:

1. It is amazing how a fundamental term like 'interlanguage', has very often been approached as if it was an 'état de langue' despite its essentially evolving nature (Tench, 1996: 245). The idea is much better captured by labels such as Nemser's 'approximative systems' (1971), Corder's 'idiosyncratic dialects' (1967) or Ch. Adjemian's 'Interlanguage Systems' (1976).

2. Tarone (1980) shows evidence of native language influence as the prevailing shaping force, but with certain patterns that may reflect a universal preference for the open syllable.

3. These are not the only sources of error. Besides transfer and universal constraints, errors can be attributed to spelling pronunciation (Altenberg and Vago, 1987), overgeneralization of a TL rule (Selinker, 1972; Beebe, 1980), hesitation phenomena, etc.

4. Major acknowledges that the distinction is not a clear-cut one. See Beebe's discussion (1984, cited by Major (1987b) and Major himself (1987a).

5. According to Altenberg and Vago (1987: 159) "the MDH is not able to predict difficulties in those areas where a subordinate markedness relationship cannot be established between the NL and the TL".

6. The philosophical debate over language universals has a long history. Trubetzkoy's typology of vowel systems, Jakobson's universal hierarchy of structural laws or Greenberg's implicational universals for glotalized consonants are well-known examples of phonological universals (Macken & Ferguson, 1981).

7. These models have been considered 'descriptively and theoretically incomplete' (James, 1994:190) on the grounds that Process models take phonological representation for granted. And structure models take learning processes lightly. In fact, he says, types of process and types of structure determine learning, but separately.

8. As Gass pointed out (1984: 129), "Language universals serve as an overall guiding principle in second language acquisition, interacting with the native language and the target language systems, at times resulting in violations of a proposed universal, at times being consistent with a given universal".

9. Stampe assumes, according to Major (1987), that the child's mental representation of his/her L1 is much the same as the adult native speaker (cf Waterson, 1971, for a different view), therefore any failure to hit the target is due to the production mechanism. On the contrary, failure in the adult FL learner may be due to both perception and production. lnterference seems more likely when there are slight phonetic differences between L1 and FL whereas gross differences are more easily perceived. In a FL context perception seems to go ahead of production and conditions to a large extent success in the target language.

10. Broselaw (1994) considers that the transfer of mother tongue patterns is a valid method for error prediction in the learner's syllable structure. In a later paper (1997) she states that "the inability to predict the occurrence and nature of many errors may well stem from inadequacies in our understanding of native speaker's competence rather than from the failure of the CAH itself. It is likely, she goes on, that a more sophisticated linguistic theory may in fact allow us to predict many of the systematic phonological errors made by the speakers of a second language".

11. Cases of syllable suppression in L1 acquisition are very common.. See Hernández Pina's Appendix in her *Teorías psico-sociolingüísticas y su aplicación al español como lengua materna* (1984) for a list of examples.

12. Hernández Pina (1984) gives some examples of both reduplication and consonant harmony found in her child's speech: [ka kaka] meaning both *la caja* (the box) and the rocking horse *(lajaca)*.[satáta] (Fuensanta, his mother's name), [papápa] *las papas* (the food), [pa'βaβa] *paraguas* (umbrella), etc.

13. See note 8.

14. Fossilization, considered inevitable by most people following Scovel (1969) has received different interpretations (see Tarone (1980) for a summary). It has been interpreted in physiological terms either as the result of cerebral lateralization of cortical functions (Lenneberg, 1967) or simply due to habit formation or muscle atrophy (Tarone, 1980) after practising a given set of patterns for years. A psychological explanation was favoured by Krashen (1977), who envisaged the end of the 'critical period' as the beginning of "learning" an FL and the end of phonological permeability. Psychological inability due to habit formation (Tarone, 1978) could also play a part in adult phonological fossilisation: perception and production would be so influenced by L1 that they would never be free again to capture other phonological input correctly. Although general, this view has been questioned among others by Neufeld (1980) who maintains that 'native-like proficiency at all linguistic levels is attainable by adults' provided we expose them to the appropriate learning situation.

15. Language specific hierarchies and hierarchies of phonological difficulties are by now means new. Already in 1950 Hans Wolf (1950) discussed a range of difficulties encountered by Puerto Ricans learners of English as an FL. Weinreich, U. (1953) established a four grade scale which Lado (1957) took over. The most explicit of all was Stockwell and Bowen (1965) who devised a six-point scale of degrees of phonological difficulties English speakers might have in learning Spanish. This was soon followed by Prator's universal phono-structural hierarchy (1967) and

by Brière's hierarchy (1968). They aimed at ranking the difficulties of a foreign of second language from a deductive, aprioristic standpoint. It was this equation of difficulty prediction, not always fulfilled, what lead researchers to favour a much more attenuated version of CA. In terms of phonological hierarchies this meant a change from a predictive to a much more interpretive view of reality as reflected, for instance, in Hammerly's Hierarchy of Difficulty (1982). More recently, there have been proposals from a universal standpoint such as Broselows' sonority hierarchy (1987) or Ekman's universal hierarchy (1987) among others.

16. See Young-Scholten (1994: 195) for a summary of different proposals ranging from the unavailability to UG to different degrees of availability through the learner's L1.

17. In Teoríaspsico-sociolingüísiicasysuaplicación a la adquisición del español como *lengua materna* (Siglo XXI, 1984) where she carried out a longitudinal study on the acquisition of Spanish by Rafael from cero to three years, she reports (p.173) that although the informant was able to say papá (daddy) and caja (box), he was unable to say paja (straw).

18. We are aware that criteria differ in this respect and that phonetic inaccuracy is interpreted by the native speaker as a phonemic distortion and therefor e as a source of accent.

19. Considering the specific character of pronunciation and its social dimensions, one should be more rigurous when talking about the phonological behaviour of L1 speakers. Although it is true that they share certain fundamental phonetic and phonological features, it is not less obvious that there is nota single, homogeneous inventory valid for all the speakers of a language. This is, I think, a very important methodological point which has not been fully considered when making statements about the specific phonological behaviour of our informants. Thus, a comparison of British and American varieties of English will yield systemic as well as non-systemic differences (O'Connor, 1973: 180) which are evident even within a given accent. RP, for instance (the target variety that we shall use), is systemically different from Northern accents. And the same applies to Spanish, where besides a broad categorization between European and non-European varieties —with various subdivisions— we can consider two main accentual varieties within Spain (Menéndez Pidal, 1942: 69 passim): a Castilian proper, spoken in Old Castile and the Court, and a Southern variety fragmented into several accents, Murciano (the one used by our informants) being among them. This distinction is very important since it crucially affects, among other things, the syllabic stmcture of both varieties.

20. lnformation taken from English Phoneiics *and Phonology. A Practical Course* (2nd edition) by P. Roach (C.U.P.) pp. 768-74.

21. There are a number of authors (e.g. Carlisle, this volume) who consider vowel insertion initially in a word as epenthesis. As this behaviour differs markedly from vowel insertion in medial position, we prefer to tell both types of insertion apart by calling them differently.

22. Other languages like Hausa, Hindi or even Pidgin English favour this process but the resulting syllable accommodates to UCSS. Thus English scholar is rendered as /sùkó:là/ in Hausa, and siick is pronounced /sitik/ in Pidgin English (Hyman, 1975: 196). The same was found for Iraqi (Broselow, 1983). But as Carlisle points out, Standard English syllabic structure violates the UCSS (Carlisle, 1997: 67).

23. Phonologically, they are not identical, but due to regressive assimilation they can "assimilate to the place of the following word-initial consonant" (Gimson, 1994: 259).

24. When we affirm that open syllables are less marked than closed ones we are not comparing various possibilities within the two categories. Open syllables refer to one type of syllables, whereas closed syllables can be of different types depending on the phonemic load of their codas. In Spanish at least, there is a big difference between a one-member closed syllable an one with two members. Positionally, there is also a difference between one-member coda structures. A closed syllable followed by a C (e.g. talco (talc)) presents more difficulties to the Spanish native speaker than the same coda finally in a word followed by a vowel (e.g. *peral* (pear tree). Pluralization requires an ealy mastery of those ambisyllabic consonants. As early as 24 months Hernández-Pina (1984: 237) reports the acquisition of consonant pluralization (ratones -mice) by her informant.

25. Elision takes different names depending on the part of the word affected. The rhetorical names are 'aphesis' when elision takes place in word initial position, 'syncope' which refers to word medial elision, and 'apocope' or word final vowel suppression (Crystal, 1980: 129). Here we use 'synaeresis' to refer to medial elision of vowels, unlike syncope which may refer to consonants as well.

26. When elision takes place across word boundaries it is called synaloepha. Spanish abounds in examples of this sort. Thus the utterance Iba a Alicante (I was going to Alicante) can be optionally reduced to the value of a single vowel: /'ibalikante/ in colloquial, allegro speech. In the IL samples or our participants occasional instances of synaloepha were found. Thus /ðɪ 'ʌðə/ or /rɪ'æləti/ were pronounced /'ðja.ðə/ and /'rja.liti/ respectively.

27. The phonetic facts are far more complex than this sketchy information may lead to think of. See Monroy (1980: Ch. 4).

28. The author has recently suffered the inconvenience of syllable merging. I phone my doctor for an appointment. The assistant told me to come a las 'doce y media' (12.30) —['do.θ.i.me.ðja]. When I turned up a las 'dos y media' (2.30) which is what I understood, I was told that I was obviously very late.

29. Although Major's Similarity Differential Rate Hypothesis (SDRH), which predicts that dissimilar phenomena between L1 and target language are acquired faster than similar ones, has been supported by Major himself in his longitudinal study of four American English (1986), is not clear whether Major and Kim's (1999) is based on a longitudinal study despite rate of acquisition being pivotal to the hypothesis.

30. Being /w/ a labio-velar sound, it can also undergo consonantal epenthesis (e.g. [la.ɣwer.ta]) if the speaker stresses the velar component, a feature typical of casual speech.

31. A clear instance of /wi/ with a glottal reinforcement is the English loan word sandwich, pronounced in Spanish ['saŋgwitʃ], never *['saŋwitʃ]. Epenthetic /g/ is not inserted, however, when word initial /wi/ is affected by hiatus. When this happens, the diphthong splits into two separate syllables. Thus, han huido (they have run away) is resyllabified as [a.nu˞.do], never *[a.ŋwi.do]. Iweland Iwilare the only dipththongs starting with /w/ that can occur initially in a word in Spanish. /wa/ cannot stand on its own and must be preceded by /g/ (e.g. guapa), and /wo/ occurs across words (uno u otro) or word-medially (e.g. *linguo-dental*), but never word initially.

32. This process is not exactly matched in L1 acquisition pace Major who suggests that "there is no fundamental difference in the mechanism of substitutions in children acquiring L1 and adults acquiring L2" (1987b: 105). According to Hernández Pina (1984) the syllabic structure CCV with liquids as a second element (e.g. grande, tren) was realised in the emerging language of her Spanish informant either with omission or reduplication of the consonants involved ([gát-te, ten]. Omission and reduplication were the only phonological processes found in CVC syllables checked by nasal, liquid or sibilant as in [sáta] (salta), [kit-tal (canta), [saté] (*sarten)*, [gút-ta] gusta (pp. 180-181). A process like reduplication was not found in the IL or our adult informants.

33. Occasionally, one finds statements (e.g. Quilis, Curso de *Fonética y* Fonología Españolas (1972: 97) in the sense that the Spanish linguo-alveolar fricative /s/ has a voiced allophone when this phoneme precedes a voiced consonant as in mismo. desde, etc. Although some voicing may take place, this is not by no means a systematic realisation (Quilis acknowledges that such realisation 'is not constant'). Spanish learners of English find little comfort in their L1 when confronted with a word like *Lisbon* as far as /s/ pronunciation is concerned. On the other hand, it is a well-known fact that the alleged voiced segment is pronounced as a voiceless aspirated fricative in large areas of Spain and South America.

34. Except S+CC structures dealt with under Epenthesis.

35. Deletion of t/d is, according to Bayley (1996: 98) "one of the most extensively studied variable phenomena in English". He mentions several studies standing out Labov's description of t/d deletion by native speakers in some dialects of English.

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