

# The Acquisition of Italian L2 Affricates: The Case of a Brazilian Learner

*Lidia Costamagna*

University for Foreigners, Perugia, Italy

costamag@unistrapg.it

## 1. Introduction

The influence of L1 on L2, in a phonological domain, is easily verifiable through the presence of the “foreign accent” in an adult learner’s interlanguage, so much so that it is possible to establish the L1, as well as the country of origin of the speaker, through the characteristics of pronunciation.

The transfer of sounds and prosodic features from L1 to L2 happens as an effect of the conditioning that perceptive system is subjected to by the phonological system of the L1, stored up in the long-term memory.

In the acquisition of similar phonemes the growth of L2 in the interlanguage is very slow and the L1 acts with greater force compared to the action of universal tendencies (Major, 1987, 2001).

Already in the early phases of learning L2 sounds that are more similar to those of the L1 are perceived as identical and for this reason are substituted by the speaker with familiar sounds of the L1 (Wode, 1983; Flege, 1987, 1995).

The acquisition of an L2 phonology is also conditioned by universal markedness (Eckman, 1977, 1991) which creates long-term learning obstacles especially for features that do not exist in the L1. Eckman’s Markedness Differential Hypothesis (1977), which highlighted how an adult’s difficulty in learning an L2, caused by the contact between the two linguistic systems, must be associated with the difficulty connected with implicational markedness, has strongly characterized much research carried out on L2 acquisition.

Universal markedness based on implicational hierarchies applied to the L2 acquisition has explained the reason for learning difficulties for elements that are not very natural or infrequent and the conditioning, in manner and time, of interlanguage development which can lead to the phenomenon of fossilization.

Conditioning of developmental processes which intervenes in the learning of an L2 pronunciation leads to the development of phenomena which cannot be directly explained by the interference which occurs between the phonological system of an L1 and that of the L2. In the early stages of the learning process the influence of the L1 on L2 is strong enough, from a phonological perspective, to block the influence of universal processes, but the subsequent development of the L2, to the detriment of the L1, opens the way for the influence of Universals, which produce phenomena in the interlanguage which are motivated neither by the L1 influence nor by the development of the L2 (Major, 2001).

In his Ontogeny Phylogeny Model (2001), by tracing the stages in the formation and evolution of the interlanguage in its approach to the L2, Major describes the influx of universal, evolutive factors<sup>1</sup> and underlines how the proportions of L1, Universals and L2 will vary, depending on the learner and phenomena involved. To describe the diverse composition of the interlanguage at its evolutive stages, when marked elements are involved, Major

---

<sup>1</sup> The Chronological Corollary of the Ontogeny Phylogeny Model describes the formation of the interlanguage as a process in which, within the growth of the L2 and decrease of L1, the influence of universal factors first grows and then decreases.

formulates the Corollary relative to Markedness in which the action of the L2 is contrasted and slowed down by the action of the Universals, whose role is greater than in cases in which less marked phenomena are involved. In stages subsequent to the initial ones of the interlanguage the degree of markedness of set phenomena manage to invalidate the action of the L2, although the action carried out by the L1 is strongly reduced.

In the case of languages that have a typological similarity – like Italian and Portuguese – the common elements in the two languages facilitate learning but also favour the phenomenon of negative transfer.

The speaker, especially in the initial stages, relies too heavily on resources from his own L1 and transfers some sounds into the L2 without any corrective intervention. This phenomenon is strongly supported by the transfer of semantically similar, but phonologically differentiated, lexical material, from the L1 to the L2 – as opposed to words with a similar spelling – which causes a slowing down and/or a stasis in the evolution of the phonological acquisition. When the speaker becomes aware of this mechanism he tries to break away from the L1 and to make an effort to use the L2 with greater care. However, in adapting to the phonological system of the L2 he is influenced by Universal phenomena.

Some substitutions made by the learner, the result of the transfer of sounds from L1 to L2, are much more persistent when the same type of substitution is motivated by universal developmental processes (Major, 2001).

Interaction of the specific factors relative to the transfer between the languages in contact and evolving and implicational factors is particularly evident in longitudinal studies which begin with elementary level learners.

The aim of this work is to study some processes that characterize the dynamic development of the interlanguage in the acquisition of affricates in the Italian L2 in a Brazilian learner.

## 2. Affricates in Italian and Brazilian Portuguese

Italian has four affricate phonemes: two dental phonemes /ts/ and /dz/, unvoiced and voiced respectively (as in the words *pizza* and *zero*), and two alveopalatal phonemes /tʃ/ and /dʒ/, unvoiced and voiced respectively (as in the words *ciao* and *buongiorno*: two forms of greetings).

The dental phonemes, in an inter-vowel position, are always long and their length has no distinctive significance whereas the length of alveopalatal phonemes is significant.

The pronunciation of these phonemes changes noticeably in the diverse varieties of regional pronunciation. In the central area in which the Brazilian speaker lived the unvoiced dental fricatives after [l, n, r] are produced like unvoiced dental affricates [ˈpenso] → [ˈpentso]<sup>2</sup>.

Affricate phonemes do not exist in Brazilian Portuguese while there are two allophones of /t/ and /d/ before palatal vowel (as in the words *timidu*, *suadade*), in which the production of the two alveopalatal phonemes is very similar to that of Italian affricates.

Four fricative phonemes exist in Portuguese – two dental /s, z/ and two alveopalatal /ʃ, ʒ/<sup>3</sup>, whereas Italian has three fricative phonemes – two dental /s, z/ and one alveopalatal /ʃ/.

Affricates are complex sounds composed of a plosive followed by a fricative with the same point of articulation. They occur in few world languages<sup>4</sup> and have a high degree of

---

<sup>2</sup> Cfr. Canepari (1999)

<sup>3</sup> Cfr. Parkinson (1988)

typological and implicational markedness which creates learning problems for foreign language speakers who do not possess them and they influence the quality of learning and time required.

### 3. Method

#### 3.1 Participants

The study of a Brazilian learner's acquisition of the affricates of the Italian L2 has been carried out longitudinally and has included a series of recordings of a Brazilian student, aged about 30, who was attending an elementary level Italian course (A1) at the University for Foreigners of Perugia in Italy, therefore in a guided context. However, due to the frequent contact the speaker had established with native speakers, the learning process can be considered mixed.

The longitudinal study of the interlanguage phonology, starting from the initial stages of the learning process, is particularly interesting because of the presence of those phenomena that emerge when the speaker begins to structure the phonological system, in an attempt to learn the pronunciation of the L2.

#### 3.2 Procedure

Data gathering took place through the recording of conversations on random subjects in which the student spoke with the researcher about various topics and through a series of productive tests.

The entire study lasted eight months and the recordings, made regularly, lasted variable extents.

The first recording was made after one month of study. The speaker had arrived in Italy with no knowledge of the language (he claimed only to know the one word *ciao*) and he was attending an elementary level course. (A1).

After being listened to and analysed, all the collected data were transcribed using the IPA alphabet, followed by an acoustic analysis of affricate phonemes through the software Praat.

The quantitative analysis regarded the number of correct affricate phoneme forms, the number of errors that the speaker made and the syllabic contexts in which those errors occurred.

The analysed corpus, gathered in a continuative and systematic way during the conversation sessions, consists of approximately 10,000 words, collected in 8 sessions<sup>5</sup>.

### 4. Results

The quantitative analysis of the correct forms of the four affricate phonemes of Italian present in the corpus shows increasing results in the last sessions (59.37, 55.63, 68.31), after a drop in the number of correct forms in the intermediary sessions of the observation. This could lead to

---

<sup>4</sup> In data contained in Maddieson (1984) affricates are present in 226 languages out of a total of 317. The unvoiced alveopalatal affricate is present in 141 languages while the voiced is present in 80 languages. The unvoiced dental affricate is present in 95 languages and the voiced only in 30 (For a synthesis of data contained in Maddieson cfr. Celata 2004).

<sup>5</sup> Some sessions were deleted as they held little significance for the purposes of this study.

the supposition that the speaker, although far from having acquired the phonemes with a *native-like* competence, is close to having completely learnt the affricate phonemes (see Figure 1).

Evaluating separately the results obtained in the production of alveopalatal phonemes and the production of dental phonemes, the situation, however, appears different.

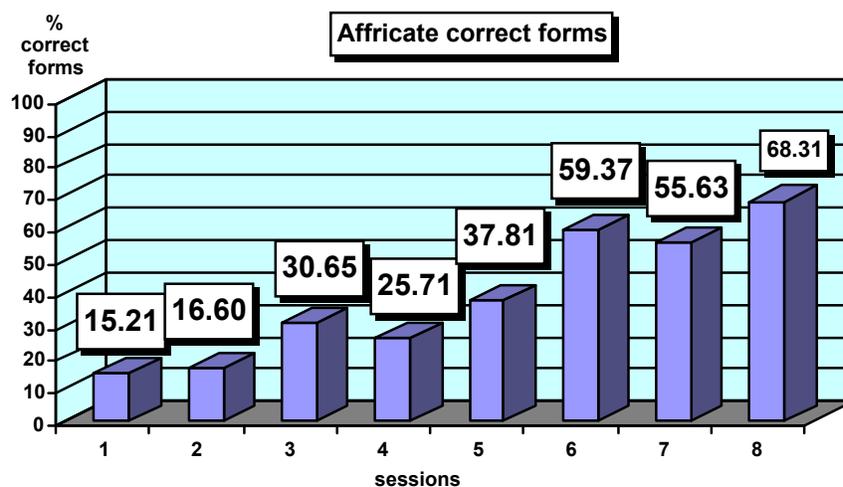


Figure 1. Affricate correct forms

There are fewer errors in the production of alveopalatal phonemes compared to the dental ones and within each single pair of affricates the voiced element, the more marked one, is the most resistant to acquisition.

Therefore the analysis presented here will be carried out taking into consideration the acquisitional trend of each pair of phonemes and comparing the results obtained for each of them.

#### 4.1 The development in learning alveopalatal affricates

The acquisition of the two phonemes [tʃ, dʒ] increased with some differences in the developmental trend between the unvoiced and voiced elements.

As has been stated before, Portuguese has two sounds [tʃ, dʒ] as allophones of /t, d/ before palatal vowels similar to the two alveopalatal affricate phonemes of Italian. This should facilitate the acquisition of the two phonemes as a result of the familiarity the learners have at a perceptive and articulatory level.

The non-native sounds that are similar to allophones in the L1 are better discriminated, thanks to the speaker's experience in his own L1, compared to the discrimination of non-native sounds that do not have an allophonic element in the L1 (Best, 1995).

The correct forms produced for the phoneme /tʃ/, rarely occurring in the first four sessions (from 10.34 to 25.00), reached a value of 56.03 from the fifth session and continued to increase constantly in the subsequent sessions to the point of reaching 78.40 (see Figure 2).

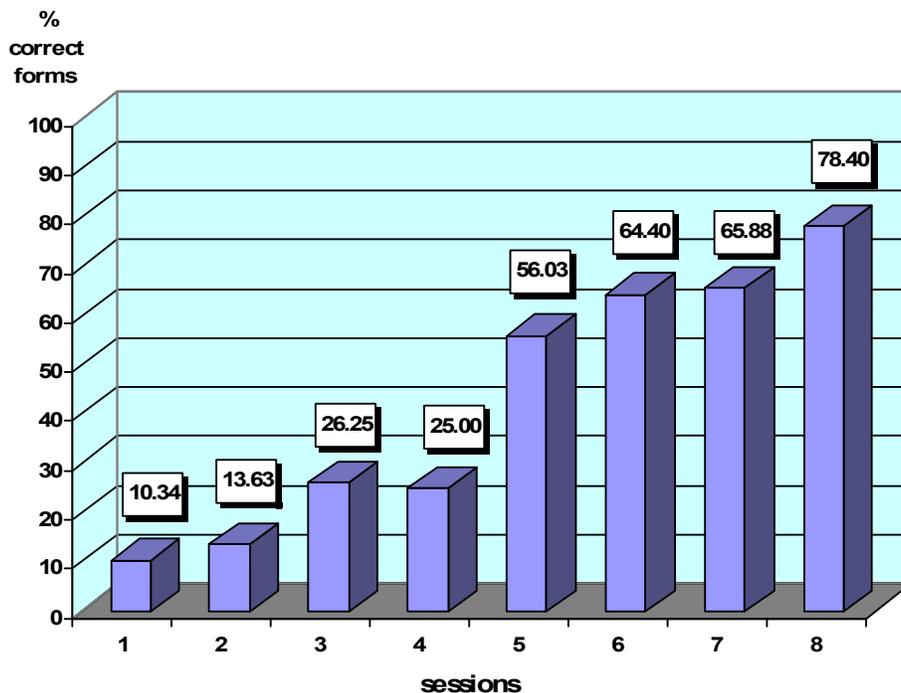


Figure 2. Alveo-palatal unvoiced [tʃ] correct forms

The phoneme /dʒ/ is produced correctly earlier than [tʃ]. There are between 30 and 44.00 correct forms, above all in initial word syllables, in the first five sessions and the figure increases sharply in the sixth session, reaching, however, a percentage of correct forms (75.55) lower than [tʃ] in the final session (see Figure 3).

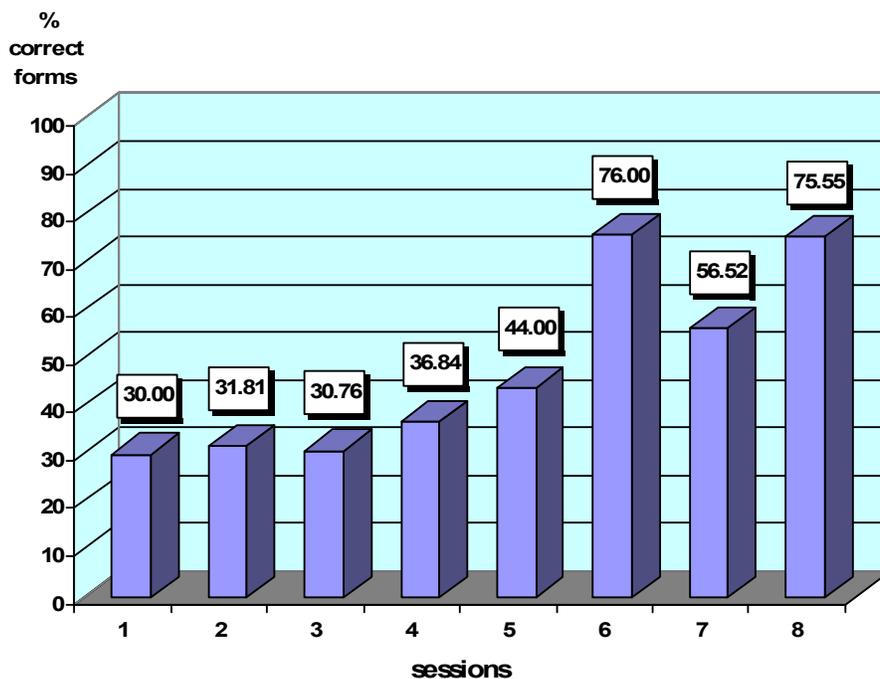


Figure 3. Alveo-palatal voiced [dʒ] correct forms

Lexis seems to have had a crucial role in the prevalence of the phoneme /tʃ/ as a vehicle for the acquisition of new features in the L2 (Giannini & Costamagna, 1998). Words containing the sound /tʃ/ are very frequent in the learner's speaking, right from the first session, thanks to the frequent use of monosyllabic words which are very frequent in the spoken Italian he had come into contact with (*c'e, ci sono, ce l'ho*) (there are 202 tokens of *ci, ce* in all the corpus). These words were learnt and often used. The more prominent and less marked favoured syllabic context (initial position and monosyllabic form) and the frequency of use (Bybee, 2001)<sup>6</sup> could have also facilitated the learning of the sound in other words.

#### 4.2 The development in learning dental affricates

The affricate dental phonemes, with a higher degree of universal markedness than the alveopalatal phonemes, created greater difficulty in acquisition.

The unvoiced dental phoneme /ts/ was not produced correctly once in the first session and had values close to zero in the second and third sessions. It was not produced correctly in the central period of the observation (sessions 4, 5 and 6) and it then had relatively low values in the final stage of the data gathering (22.72, 20.58) (see Figure 4).

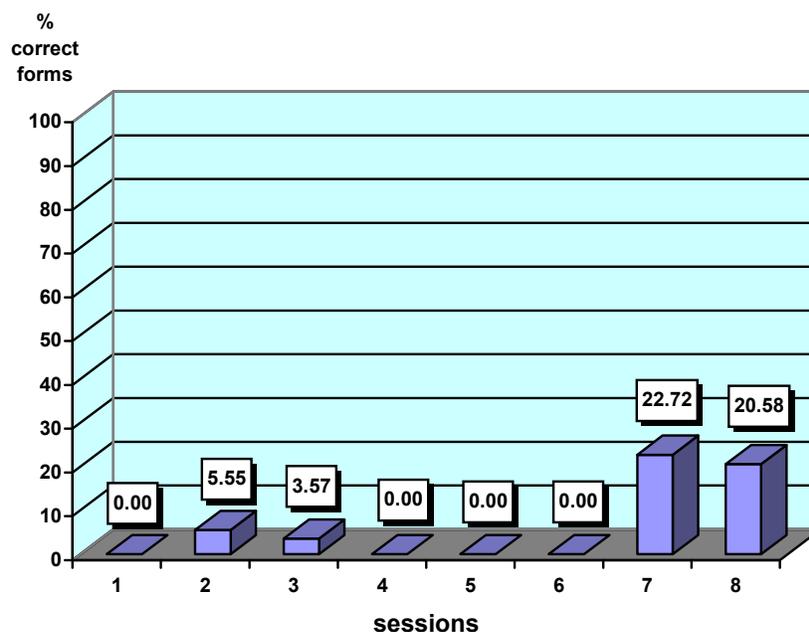


Figure 4. Dental unvoiced [ts] correct forms

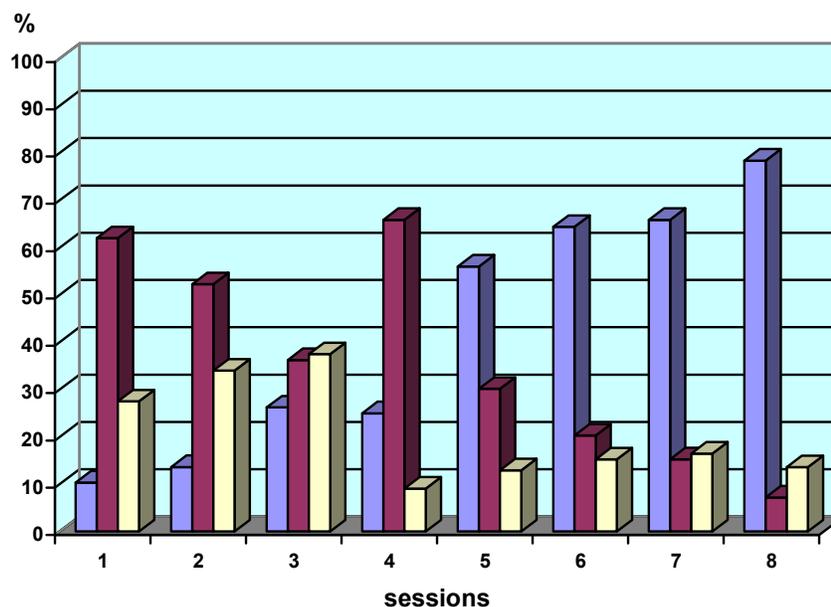
The phoneme /dz/, even more marked than the previous phoneme, was not acquired and was used only occasionally in the corpus (11 occurrences). It was not even used by the speaker in verbal forms deriving from nouns (*analisi – analizzare*). /dz/ was produced correctly three times for one word only and in the remaining cases it was replaced by the fricative /z/.

<sup>6</sup> The frequency with which certain words or sequences of words are used and the frequency with which certain patterns recur in a language influence the nature of the mental representation and, in some cases, the phonetic form of the words.  
 “Phonetic change often progresses more quickly in items with high token frequency” (Bybee, 2001).

## 5. Discussion

The qualitative analysis of errors relating to the unvoiced phonemes /tʃ/ and /ts/<sup>7</sup> is significant enough to understand the difficult path which led the speaker to the structuring of the affricate system in Italian.

Errors with the phoneme /tʃ/ were caused by substituting it with the fricatives /s, ʃ/ (in 39.43% of cases)<sup>8</sup> and by biphonematic<sup>9</sup> production of the affricate phoneme (52.81%). Extensive use of biphonematic production<sup>10</sup> and the rather constant values of fricativisation, although diminishing in the last sessions, is evident from the graph (see Figure 5).



**Figure 5.** [tʃ] Relationship between correct, byphonematic, fricative forms

Realising the level of difficulty in producing the sound [tʃ] and the high number of fricatives he produces to replace the affricates, the speaker experiments with the production of the sound, above all in initial word syllables, but he produces biphonematic forms in the majority of cases, influenced by universal, evolutive factors.

The subsequent constant drop in biophonematic production which contrasts a constant increase in correct production would indicate a slackening in the action of Universals which leaves space for the expansion of L2.

<sup>7</sup> The acquisition of voiced phonemes has highlighted less noted phenomena and for this reason we focussed principally on unvoiced phoneme acquisition. The same situation was verified in Celata (2004).

<sup>8</sup> The widespread phenomenon of fricativisation of affricate phonemes occurred almost exclusively in the inter-vowel and post-consonant context.

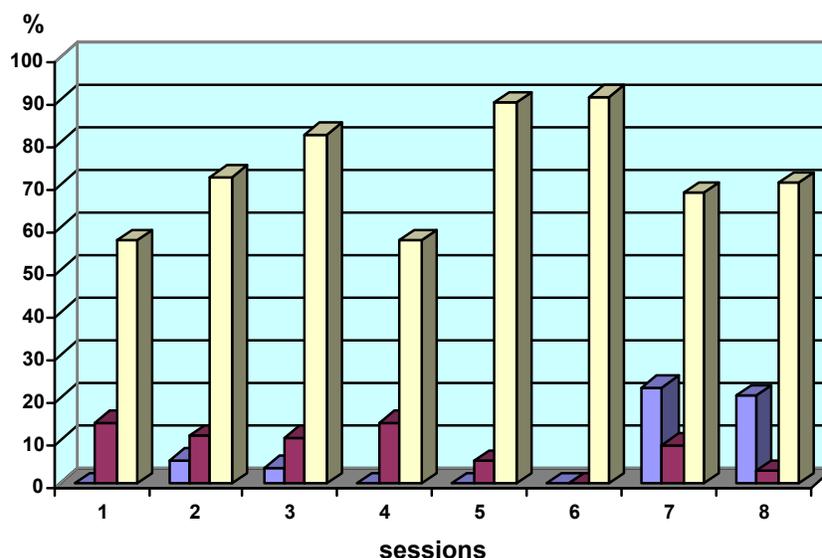
<sup>9</sup> In the biphonematic sequence the length of the production of the plosive and fricative is usually greater due to an increase in the length of frication. These are characterised by the development of a more continuous and widespread energy of the affricates, in which the development of energy is clearer and more sudden (Ladefoged & Maddieson, 1996; Celata, 2004).

<sup>10</sup> The biphonematic forms, even if acceptable in a native speaker, have been excluded from the calculation of correct forms as they represent a passing phase which is useful to better understand ways of learning the affricates.

The approach to the alveopalatal phoneme of the L2, through biphonematic forms, which the learner feels to be correct, leads him to experiment, using the sound also for [ts], unifying in some cases the point of articulation of [tʃ] and [ts] in an alveolar area and producing a sound not assimilable either to that of the L1 or to that of the L2 (as, for example, in *ufficio, certo, negozio*)<sup>11</sup>.

The substitution of /tʃ/ with the dental fricative /s/ and with the alveopalatal [ʃ] is evidence of the speaker resorting to tools from the L1<sup>12</sup> (lexical and phonetic for [s] and more strictly phonetic for [ʃ]) but is also clear evidence of the action of universal factors.

The acquisition of /ts/ creates great difficulty for the learner. He substitutes the affricate with the dental fricative [s] in the majority of cases (he does so in 50 out of 57 cases in sess. 5) (see Figure 6).



**Figure 6.** [ts] Relationship between correct, byphonematic, fricative forms

This error occurs frequently when the speaker wants to communicate rapidly and relies totally on lexis from his own L1<sup>13</sup>. However, even in this case, recourse to the fricative is also due to tendencies of a universal character which accompany the evolution of the system up to the end of the observation.

The learner, influenced by the surrounding linguistic environment with which he has come into contact<sup>14</sup>, uses, in some cases, the dental affricate in contexts in which the fricative would be required (*penso, pensione*). This factor could have increased the degree of difficulty in systemising a clear picture of the affricates and fricatives in as much as the regional

<sup>11</sup> In the first sessions the speaker also produced many Italian words with the phonemes /t, d/ followed by /i/ with the allophones [tʃ, dʒ] creating at times misunderstandings in the speaking: he pronounced [la'tʃina] (*China*) for [la'tina] (*Latin*); [ˈdʒita] (*trip*) for [ˈdita] (*fingers*).

<sup>12</sup> Some words that contain the error are similar in the two languages and the speaker resorts to using them especially during conversations in which he wants to participate more actively and so he relies more on L1 lexis (*concerto, edificio, incendio, speciale*).

<sup>13</sup> The fricative is present in many words similar to those of the mother tongue.

<sup>14</sup> Cfr. Par 2.2

pronunciation of the speaker leads him to connect the production of the unvoiced dental affricate in words which contain the grapheme < s > in their writing.

The picture is clearer for the voiced phonemes. The errors with [dʒ] are due to substitution, especially in inter-vowel positions, with the alveopalatal fricative [ʃ], whose use is very significant even in the last sessions.

[dz]<sup>15</sup> is not learnt, is rarely used and is replaced by the fricative [z] in all cases.

## 6. Conclusion

The acquisition of Italian affricates by this Brazilian speaker presented a rich picture of variations involving, above all, unvoiced phonemes, those less marked and more frequent in the learner's speaking.

The speaker commits many errors of substitution of affricates with fricatives<sup>16</sup>, elements which are favoured since they are less marked, but, even from in the beginning stages, the speaker experiments with the production of the unvoiced alveopalatal affricate [tʃ]. Awareness of the closeness between the L1 and L2 prevented a correct learning of Italian pronunciation (the speaker describes this fact during a *stimulated recall*). It enabled the learner to distance himself from his own L1 which strongly influenced his interlanguage, so much so as to be incomprehensible<sup>17</sup> at times.

The presence of the sound [tʃ], as an allophone of /t/ before a palatal vowel in the L1 of the learner, facilitates the production of the alveopalatal phoneme, above all in the prominent and less marked position in initial word syllables and in monosyllabic words (*ci*, *ce*). The sound [tʃ] seems to constitute the prototype<sup>18</sup> from which the speaker attempts to build and modify his own phonological system of the L2, enriching it with affricate phonemes in opposition to fricatives.

The pronunciation of the phoneme [tʃ], strongly threatened by fricatives in the consciousness of the learner, tries to establish itself but, under the influence of the Universals, is produced as a biphonemic sequence.

As the learning process develops the presence of biphonemic forms noticeably decreases and gives way to correct forms. This shows how the action of Universals on the learning of this phoneme has diminished with time, leaving space for the L2.

Biphonemic production, similar to affricate production of natives, is felt to be correct by the speaker and, in spite of there being a strong conflict with the L1, it establishes itself, also thanks to the frequency factor. Biphonemic alveopalatal production, perceived as the prototypical sound for affricates, is also used at times for production of the phoneme /ts/.

The speaker seems to strictly relate [ts] with [tʃ] and indeed some forms are produced in an identical way or with a minimal variation. This analogy is confirmed by the type of errors committed by the speaker. [s] is the dental sound used to produce both the phonemes, even when not motivated by factors connected with the L1, while the more widespread adoption of the alveopalatal fricative in place of the corresponding affricate would have been expected.

---

<sup>15</sup> The phoneme /dz/ is marked and difficult to acquire, above all for speakers who do not possess it in their own L1. In many cases it is not even pronounced correctly by advanced level students.

<sup>16</sup> Substitution with fricatives is very common in speakers of diverse foreign languages who have difficulty in learning the affricates.

<sup>17</sup> With great surprise the speaker tells the researcher that at times he is not understood by native speakers.

<sup>18</sup> Cfr. Kuhl & Iverson 1995

It is reasonable to think that the two allophones [tʃ, dʒ] present in the L1, although guiding the learner along the way to the acquisition of affricates in Italian, have made learning all the affricates very slow and complex, since they have no functional value in the L1.

The phenomenon /ts/ is produced correctly by the Brazilian speaker in very few cases and is strongly influenced by L1 lexis which reinforced use of the dental fricative. In this case the action of universal factors gave way to the L1, determining a lowering of the number of correct forms. As the learning process progressed, [ts] was produced correctly, in some cases, but L1 influence remains very strong until the end of the observation.

The number of cases of fricativisation of the unvoiced dental affricate, although lower in the final sessions, is constant, demonstrating that the result persists for longer in the learners' interlanguage if the L1 influence produces a substitution which is confirmed by Universals (Major, 2001).

The Brazilian speaker's long and complex acquisition of affricates confirms how similarity and markedness strongly affect the time required and manner of acquisition of an L2 and can be responsible for the failure to learn some features.

## References

- Archibald, J. (1998). *Second language phonology*. Amsterdam: John Benjamins.
- Best, C. T. (1995). A direct realist view of cross-language speech perception. In W. Strange (Ed.), *Speech perception and linguistic experience: Theoretical and methodological issues* (pp.171-204). Timonium, MD: York Press.
- Broselow, E. (1987). An investigation of transfer in second language Phonology. In G. Ioup, & S. H. Weinberger (Eds.), *Interlanguage Phonology: The acquisition of a second language sound system* (pp. 261-278). Cambridge, MA: Newbury House.
- Bybee, J. (2001). *Phonology and language use*. Cambridge, MA: Cambridge University Press.
- Canepari, L. (1999). *Manuale di pronuncia italiana*. Bologna: Zanichelli.
- Carroll, S., & Meisel J. M. (1990). Universals and second language acquisition. *Studies in Second Language Acquisition*, 12, 201-208.
- Celata, C. (2004). *Acquisizione e mutamento di categorie fonologiche. Le affricate in italiano*. Milano: FrancoAngeli.
- Costamagna, L. (2003). Affricates in Italian as L2: The role of psycho-attitudinal parameters. In L. Costamagna, & S. Giannini (Eds.), *La fonologia dell'interlingua: Principi e metodi di analisi* (pp.95-129). Milano: FrancoAngeli Editore.
- Eckman, F. R. (1977). Markedness and the contrastive analysis hypothesis. *Language Learning*, 27, 315-330.
- Eckman, F. R. (1991). The structural conformity hypothesis and the acquisition of consonant clusters in the interlanguage of ESL learners. *Studies in Second Language Acquisition*, 13, 23-41.
- Flege, J. E. (1987). The production of "new" and "similar" phones in a foreign language: Evidence for the effect of equivalence classification. *Journal of Phonetics*, 15, 47-65.
- Flege, J. E. (1993). Production and perception of a novel, second-language phonetic contrast. *Journal of the Acoustical Society of America*, 93, 1589-1608.
- Flege, J. E. (1995). Second language speech learning. Theory, findings and problems. In W. Strange (Ed.), *Speech perception and linguistic experience: Theoretical and methodological issues* (pp. 233-277). Timonium, MD: York Press.
- Giannini, S., & Costamagna, L. (1998). Acquisizione di categorie fonologiche e diffusione lessicale del mutamento linguistico: Affinità strutturali. *Archivio Glottologico*, 2, 150-187.
- Ioup, G., & Weinberger, S. H. (Eds.) (1987). *Interlanguage phonology: The acquisition of a second language sound system*. Cambridge, MA: Newbury House.
- James, A., & Leather, J. (Eds.) (1986). *Sound patterns in second language acquisition*. Dordrecht: Foris.

- Kuhl, P. K., & Iverson P. (1995). Linguistic experience and the perceptual magnet effect. In W. Strange (Ed.), *Speech perception and linguistic experience: Theoretical and methodological issues* (pp. 121-154). Timonium, MD: York Press.
- Ladefoged, P., & Maddieson I. (1996). *The sounds of the world's language*. Oxford: Blackwell.
- Maddieson, I. (1984). *Patterns of sounds*. Cambridge: Cambridge University Press.
- Major, R. (1987). Phonological similarity, markedness and rate of L2 acquisition. *Studies in Second Language Acquisition*, 9, 63-82.
- Major, R. (2001). *Foreign accent: The ontogeny and phylogeny of second language phonology*. London: Lawrence Erlbaum.
- Strange, W. (Ed.) (1995). *Speech perception and linguistic experience. Issues in cross-language research*. Timonium: York Press.
- Wode, H. (1983). Phonology in L2 acquisition. In H. Wode (Ed.), *Papers on language acquisition, language learning and language teaching* (pp.175-187). Heidelberg: Groos.
- Wode, H. (1996). Speech perception and L2 phonological acquisition. In P. Jordens, & J. Lalleman (Eds.), *Investigating second language acquisition* (pp.321-353). Berlin: Mouton de Gruyter.