

Clitic pronouns and past participle agreement in Italian in three hearing impaired bilinguals Italian/LIS

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The aim of this study is to assess the comprehension and to elicit the production of clitic pronouns in sentences with left-dislocation, in three adult hearing impaired bilinguals Italian/LIS and in four hearing speakers of Italian. The occurrence of clitic pronouns and the presence of past participle agreement in Italian are investigated through sentence completion and grammaticality judgement tasks. Results suggest that, in spite of late exposure to the oral language due to hearing impairment, the linguistic competence of the hearing impaired individuals is quite intact and the syntactic information is correctly projected in the syntactic tree. Because of a very selective impairment in the morphology of clitic pronouns, only a qualitative analysis of the errors is possible. The non-standard forms are discussed within the framework of the recent research on ϕ -features from a syntactic, morpho-phonological and psycholinguistic point of view. The statistically significant better performance on plural clitic pronouns as opposed to singular ones confirms the findings of previous studies on gender and number features and proves once again that number information is retrieved earlier than gender information *.

1. Introduction

This paper investigates the linguistic competence in Italian of three adult hearing impaired bilinguals (Italian/Italian Sign Language-LIS) through sentence completion and grammaticality judgement tasks, assessing the comprehension and eliciting the production of third person accusative clitic pronouns in sentences with left dislocation.

This work originates within the framework of generative grammar from much existing literature on language acquisition, both in Italian and other languages, and on the implications that a delayed access to the input due to hearing impairment may cause to this process. The analysis of responses shows that the performance on clitic pronouns varies according to the presence of simple or compound tenses, in which past participle agreement is also required, and according to the different combination of gender and number features (confirming the conclusion drawn by De Vincenzi & Di Domenico 1999).

The paper is organized as follows. Sections 2 and 3 present some data on the acquisition of clitic pronouns in individuals showing typical and atypical language development in different Romance languages and demonstrate that object clitics are sometimes problematic and acquired with some delay when compared with subject clitics or determiners. Section 4 outlines the linguistic background accounting for the occurrence of third-person object clitics and for agreement phenomena deriving from their presence in left-dislocation sentences. Section 5 focuses on the experiment, presenting the subjects involved, the materials used and the results achieved in the different tasks, also showing a classification of the type of errors made by the participants. Section 6 discusses the collected data within the current research on gender and number features.

2. Typical and atypical language acquisition

First language acquisition is a fast and seemingly effortless process. Every child is born equipped with a language faculty, which requires being stimulated very early in one's life in order to allow him/her to attain the knowledge of his/her own language. If this faculty is stimulated too late, language acquisition is delayed, leading to severe consequences for the development of linguistic abilities.

Deafness is a sensory impairment which leaves the language faculty intact, but which seriously limits the person's ability to acquire an oral language naturally. Hearing impaired people cannot develop an oral language as easily as their hearing peers because they do not have direct access to the linguistic input.

Many variables might influence the language development in hearing impaired people. In any case the hearing impairment entails a delayed acquisition and consequently a difficulty in the domain of grammatical morphology and in the use of some functional elements, such as determiners, auxiliaries, prepositions and pronouns (Volterra & Bates 1989, De Villiers J.G et al. 1994, Fabbretti et al. 1998, Franchi 1998, Tuller 2000, Ajello et al. 2001, Volterra et al. 2001, Tuller & Jakubowicz 2004, Fabbretti 2006, Fabbretti et al. 2006, Delage & Tuller 2007). These alone have no intrinsic meaning, but their presence is fundamental in deriving the meaning of a sentence.

However, it is quite possible for hearing impaired subjects to face this arduous task, as was the case in a study conducted on two orally-trained hearing impaired adults (Volpato 2002). This study investigated the production and comprehension of clitic pronouns in left-

dislocation sentences and showed that the linguistic impairment of these subjects is very limited and their competence in Italian is quite intact. The hearing deficit, which hindered them from acquiring the Italian language naturally, has not influenced their learning process, and it is certain that the long period of rehabilitation they endured has allowed them to gain a good knowledge of Italian.

The same considerations are valid for the three hearing-impaired bilinguals Italian/LIS studied in this paper. I show that these three individuals have indeed attained a very good competence in Italian, with a very selective impairment in the morphology of clitic pronouns which is significant for the theory of ϕ -features.

3. The development of clitic pronouns across different acquisition modes

The morpho-syntactic impairment in the use of clitic pronouns is not a surprising phenomenon. Indeed, it is well-known from literature that these elements are complex for hearing impaired people, for typically-developing individuals and for other categories of individuals showing atypical language development.

Chesi (2000) & (2006) investigated the production of hearing-impaired Italian children and found that they omitted a great deal of functional elements (articles, clitics, prepositions, auxiliaries).¹ What Chesi noticed in his study was a widely attested tendency to avoid accusative clitic pronouns, by adopting a strategy that involved the substitution of the clitic pronoun with a DP (1a) or the omission altogether of the clitic and of the direct object complement (1b):

- (1) a. *Poi il topo scappa e arriva il gatto per acchiappare il topo...*
‘then the mouse runs away and arrives the cat to catch the mouse...’
TARGET: *Poi il topo scappa e arriva il gatto per acchiapparlo.*
‘then the mouse runs away and arrives the cat to catch-it:CL’
‘then the mouse runs away and the cat arrives to catch it’
- b. ... *la padrona (∅) ha aperto (∅), ha preso il gatto.*
... ‘the mistress has opened ∅, has caught the cat’
TARGET: ... ‘*la padrona (lo) ha aperto (il frigorifero) e ha preso il gatto.*’
... the mistress (it:CL) has opened (the fridge) and has caught the cat
‘... the mistress opened it/the fridge and caught the cat.’

These difficulties are, however, not peculiar to hearing impaired people. The production of accusative clitics has also been investigated in typical first and second language acquisition (Pirvulescu 2006,

Hamann & Belletti 2006, Wexler et al. 2002) as well as in atypical language development, such as SLI children (Leonard et al. 1992, Bortolini et al. 2006, Jakubowicz et al. 1998), across different languages (Italian, French, Spanish and Catalan). In comparing the use of determiners, and nominative and object clitics by all these individuals, these studies revealed that, while determiners and nominative clitics are accurately produced, object clitics are more problematic and are mostly avoided, resulting again in ungrammatical omission or infelicitous repetition of a full lexical DP.

For Spanish and Catalan, Wexler et al. (2002) conducted an experiment on typically-developing children in order to check whether they produce or omit clitics and whether they produce the correct clitic forms in both languages. Results show that in both languages, the produced clitics are placed correctly before finite verbs and after non-finite verbs. With respect to the rate of clitic omission, they found that Catalan-speaking children omit clitics significantly more frequently than Spanish-speaking children and that the omission rate is above all very high at early stages of language acquisition. Then omissions begin to decrease by the age of three and completely disappear by the age of four.

The results of the study carried out on spontaneous speech in French first language acquisition by Pirvulescu (2006), and the linguistic research conducted by Hamann & Belletti (2006) on early L1 and L2, and adult L2 acquisition of French, show a similar delay in the acquisition of object clitics. These two studies investigate the acquisition of object complements in comparison to subject pronouns and reveal that in typically developing monolinguals, complement clitics begin to appear about four to six months later than subject clitics. This time span is longer in early and adult L2 speakers. In all cases, the most common strategy used to overcome the difficulties deriving from the necessity to place the direct object is again the use of a full lexical DP. However, as soon as typically-developing children begin to produce object clitics, they place them correctly, as opposed to L2 and bilingual children, who tend to misplace them.²

Hamann & Belletti (2006) also focussed their attention on the acquisition of complement clitics in French-speaking SLI children. Consistent with the results achieved by Jakubowicz et al. (1998) in the same language pathology, this study revealed that SLI children show lower accuracy than typically-developing children in the use of object clitic pronouns, compared with definite determiners or subject pronouns. For Italian, Leonard et al. (1992) and Bortolini (2006) compared SLI children and typically-developing children in the use of

both clitic pronouns and determiners. Although both elements proved to be difficult for SLI children, determiners were nonetheless more accurate than clitic pronouns.

The absence or very rare use of complement clitics may persist for several years in SLI children, the time span for their acquisition being even longer than for typically-developing ones.

Although in this paper we are concerned with atypical language acquisition due to hearing impairment, all these studies reveal a pattern of development common to all acquisition modes. The difficulty and the delay in the acquisition of third person accusative clitics that all individuals in the various Romance languages (including Italian) show are presumably due to the 'reduced' status of these functional elements, both from a syntactic, phonological and morphological point of view (Cardinaletti & Starke 1999), and to the complex syntactic movement they undergo in their way up to the top of the syntactic tree when compared to that of weak and strong pronouns. The present study is only concerned with the occurrence of pre-verbal direct object clitics, which occupy a functional head in the high part of the clausal structure by attaching onto the verb that carries the features of finite morphology.

In the next section I present some linguistic proposals that account for the occurrence of accusative clitic pronouns within clause structure.

4. Linguistic background

In this section I outline the main properties of the sentences administered in the experimental task, as well as issues on these structures raised by linguists within the framework of Generative Grammar.

4.1 The analysis of Clitic Left-Dislocation (CLLD)

The Italian language makes it possible for the object to be left-dislocated, that is, it occupies a position at the very beginning of the sentence, in the left periphery of it, and a resumptive clitic is placed before the finite verb:

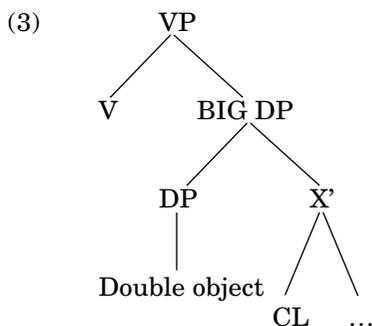
- (2) a. Il latte_i, il bambino lo_i beve ogni mattina.
The:M.SG milk:M.SG, the child it:M.SG drinks every morning
'The child drinks it every morning (the milk).'

b. I ladri, il poliziotto li, ha arrestati.

The:M.PL thieves:M.PL, the policeman, them:M.PL has arrested:M.PL
 ‘The policeman arrested them (the thieves).’

Such doubling structure, in which both a full DP and a clitic pronoun appear in the sentence, is called Clitic Left Dislocation – CLLD – (Benincà 1988/2001, Cinque 1990) and is largely attested in Italian. In left-dislocation sentences, clitic pronouns refer back and are co-indexed with an antecedent (DP) previously given in the linguistic or extralinguistic context. The clitic pronoun and the antecedent share the same ϕ -features.

Two types of analysis of CLLD have been put forward in the literature. According to a base-generation hypothesis (Cinque 1990), the dislocated element and the clitic are generated in their surface position. Other studies suggest instead that these elements attain the surface position by movement (Cinque 1977, Cecchetto 1999, Torrego 1992, Belletti 2005 and others). The hypothesis adopted in this paper is the movement analysis of CLLD suggested by Torrego (1992) and Cecchetto (1999).³ Because of the presence of two arguments in the direct object position, they assume that in doubling structures like CLLD sentences, the left dislocated element is base generated in the VP in the ‘double’ position within the so-called ‘big DP’ argument. The clitic is thus inserted from the lexicon as the head of this special DP, which hosts the double XP in its Spec position.



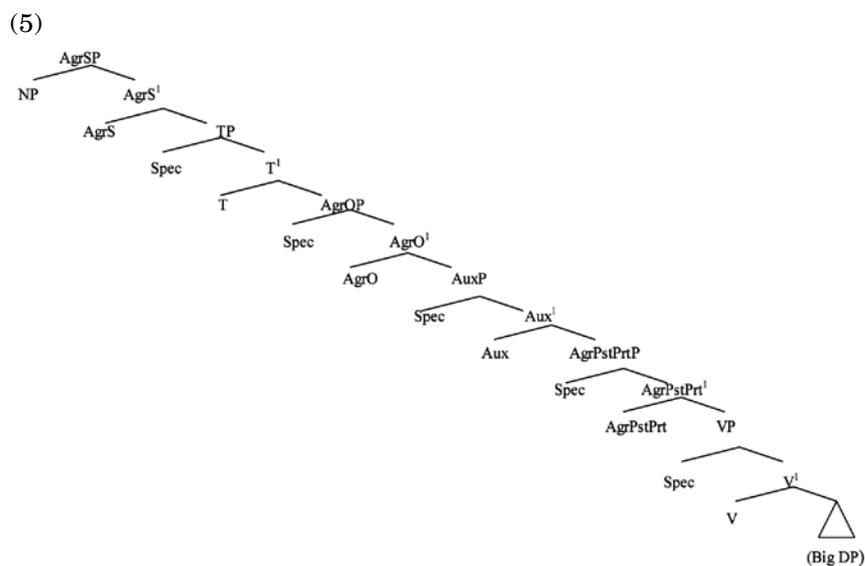
In CLLD, the topicalized constituent moves and ends up in the specifier position of a Topic projection in the left periphery of the clause (Rizzi 1997), and the resumptive object clitic pronoun cliticizes onto the verb.

4.2. *Past participle agreement*

In configurations with compound tenses, like those in (2b) and (4), there is overt agreement in ϕ -features between the clitic and the past participle:

- (4) a. *Li ha arrestati.*
 (HE) them:M.PL has arrested:M.PL
 'He has arrested them.'
 b. *Le ha arrestate.*
 (HE) them:F.PL has arrested:F.PL
 'He has arrested them.'

Kayne (1989) suggests that the ϕ -features of gender and number appearing on the past participle should be the result of an agreement relation between the past participle and the moved element (noun phrase or clitic). The supposition deriving from this assumption is that there is an Agr projection above past participle and that the moved constituent triggers agreement in its passing through its Spec on the way to its final landing site. This Agr projection was identified with the AgrO projection responsible for accusative Case checking in Chomsky (1993). Friedemann & Siloni (1997) provide evidence that the projection associated with accusative Case (AgrOP) is to be kept distinct from the projection where number and gender features of past participles are checked (labelled AgrPstPrtP), and suggest the following structure:



This statement derives from some observations on passive, unaccusative and transitive verbs. Passives and unaccusatives (unlike transitive verbs) are unable to assign accusative Case and do not realize an external argument. Consequently they lack the AgrOP projection. If accusative Case assignment and past participle agreement were one and the same process, they would always co-occur. On the contrary, checking of accusative Case occurs independently of the presence or lack of a past participial morphology, and past participle agreement is completely independent of the presence of accusative Case checking. This is confirmed by the obligatory agreement between past participle and grammatical subject with unaccusative verbs and in passive sentences (6a-b) or by the lack of past participle agreement with transitive verbs the object of which does not undergo cliticization (7):

- (6) a. Maria è arrivata.
 Maria:F.SG has arrived:F.SG
 'Maria has arrived.'
 b. La finestra sarà aperta da Maria.
 The window:F.SG will be opened:F.SG by Maria
 'The window will be opened by Maria.'
- (7) Gianni ha aperto la porta.
 Gianni has opened:M.SG (default) the door:F.SG
 'Gianni has opened the door.'

In conclusion, clitic pronouns check accusative Case in AgrO and past participle agreement in AgrPstPrtP⁴. The derivation of clitic pronouns with simple and compound tenses is differentiated as follows. A two-step movement is involved in the derivation of clitic pronouns with simple tenses (Sportiche 1989; Belletti 1999; Cardinaletti & Starke 1999), where only syntactic effects are visible:

- (8) a. pro compro le mele
 (I) buy the:F.PL. apples:F.PL.
 'I buy the apples.'
- b. [_{AgrSP} pro Le compro [_{AgrOP} ___ [_{VP} ___]]
 _____|_____
- (I) them:F.PL. buy
 'I buy them.'

All of them were diagnosed as hearing impaired at birth and they acquired the Italian Sign Language (LIS) as their first language. They were born to hearing impaired parents and mainly attended special schools for the deaf. Speech therapy and linguistic training of Italian spoken language were carried out during school time by their schoolteachers. The activities through which they were trained to the Italian language were mainly dictations and reading tasks. At the moment, all of them are teachers of LIS at the university or in special schools for LIS learners. Although they have been living in the north of Italy for many years, they were born and spent some years in the South of Italy.

The hearing group was composed of four participants:

Table 2. Hearing participants.

SUBJECTS	AGE
VC	26
LM	24
ST	24
LT	26

They were selected on the basis of age and above all of school education (the length of schooling was at least 13 years). All of them live in Preganziol (Treviso) in Northern Italy. Some hearing participants habitually use the dialect spoken in this area at home and with their friends.

5.2. Procedure

Each participant was assessed individually and sentences were administered in different sessions of about 30 minutes each. All tasks were presented visually, on separate strips of paper, in order to avoid errors deriving from incorrect lip-reading.⁶

5.3. Materials

The experiment can be divided into two distinct parts. The former part consists of some pre-experimental tasks – namely delayed repetition and grammar comprehension tasks – and aims at determining whether the participants could have difficulties in processing long sentences and performing complex tasks, as well as in assigning θ -roles to sentence constituents. The latter part includes the main tasks and is concerned with the occurrence of third person accusative

clitics in left dislocation sentences, and with the correct agreement in gender and number between clitics and their antecedents as well as between clitics and past participles.

The pre-experimental part was composed of the following tasks:

- Delayed repetition task, consisting in the repetition of completely unrelated series of words (10a) and repetition of sentences (10b). The task involving words included series from two, three, four and six stimuli. The task involving sentence repetition included items presenting typical word order (Subject-Verb-Object), passive sentences, sentences with unaccusative verbs selecting dative complements and clitic left dislocation sentences.

(10) a.

SPECCHIO	LATO	SASSI
Mirror	Side	Stones

b.

IL CANE MORDE L'UOMO

The dog bites the man

- A picture matching task, which is included in the B.A.D.A. test (Miceli et al. 1994). This is a visual grammar comprehension test, investigating the comprehension of different kinds of sentences, and testing morphological comprehension (e.g. *Gli uomini sono inseguiti dalle donne* 'the men are chased by the women') and reversibility (e.g. *La bambina accarezza la nonna* 'the child:F caresses the grandmother') in active and passive structures.

The main part of the experiment was composed of the following tasks:

- An elicited production task (sentence completion task – SC), which consisted of sentences that had to be filled in with the correct third person accusative clitic and the correct form of the verb given in brackets (113 gaps in total). Some sentences required verbs in simple tenses (present and imperfect) and some others in compound tenses (passato prossimo).⁷ Some sentences were presented with the already inserted clitic, agreeing in gender and number with the antecedent, in order to determine whether the participants could be sensitive to the presence of this functional element and whether the clitic could then help to trigger the past participle agreement in compound tense sentences. The items to be completed with both the clitic and the agreeing verb involved sentences eliciting the masculine singular clitic *lo*, sentences eliciting the feminine singular clitic *la*, sentences eliciting

the masculine plural clitic *li* and sentences eliciting the feminine plural clitic *le*.

The task included sentences such as the following examples:

- (11) a. Tu e tuo fratello, la luce _____ (accendere), perché la stanza era al buio.
You and your brother, the light:F.SG ____ (to turn on), because the room was dark.
'You and your brother (turned on) the light, because the room was dark.'
- b. Il ladro, i poliziotti _____ (arrestare) ieri sera.
The thief:M.SG, the policemen:M.PL _____ (to arrest) last night.
'The policemen arrested the thief last night.'
- c. I carabinieri, il ladro, lo _____ (arrestare).
the policemen:M.PL, the thief:M.SG, him _____ (to arrest).
'The policemen arrested the thief.'

• A grammaticality judgement task (GJ), which involved giving a judgement of correctness or incorrectness to a series of items. Participants were presented with 80 items containing again the four different accusative clitic pronouns, the masculine singular clitic *lo*, the feminine singular clitic *la*, the masculine plural clitic *li* and the feminine plural clitic *le*. The ungrammatical constructions contained agreement errors between the subject and the auxiliary verb, between the clitic pronoun and the object and, in the sentences with a compound tense, between the clitic pronoun and the past participle. Some examples are illustrated in (12):

- (12) a. *L'alunno, i libri, li hanno chiusi, dopo aver finito di studiare.
the student, the:M.PL books:M.PL, them:CL.M. have closed, after he finished studying
'The student has closed the books, after he finished studying.'
- b. La mela, mio fratello, l'ha mangiata.
The:F.SG apple:F.SG, my brother, it:CL.F. has eaten
'My brother has eaten the apple.'

5.4. Results

In this section, an account of the errors made by the participants will be given and discussed separately for each type of task. The analysis of the data collected in the various experimental tasks proved that the errors made by the three hearing impaired participants are quantitatively few and consequently particular attention will be paid above all to the qualitative analysis of their performance.

Data resulting from sentence completion and grammaticality judgement tasks were analysed by using two statistical tests. The Mann Whitney test was necessary to compare the performance between the two groups, and the Wilcoxon test was used to determine whether a significant difference could exist in the occurrence of the four object clitic forms. Results were calculated separately for the two main tasks.

5.4.1. Performance in the pre-experimental tasks

We will start our analysis by examining the results in the different tasks of the pre-experimental session.

In the sentence repetition task, all participants performed at ceiling (Table 3):

In the word repetition task and in the picture matching task, the hearing impaired and the hearing subjects showed the same pattern of performance, with a percentage of correct responses between 85% and 87% in the former (Table 4), and above 95% in the latter (Table 5):

The Mann Whitney test was carried out to analyse data in these tasks, and results did not show any significant difference between the two groups of participants: word repetition task $U=5$ $p=.724$ and picture matching task $U=3$ $p=.262$. The low performance in the word repetition task was above all due to the repetition of some series of six words, which was similarly difficult for both groups.

5.4.2. Performance in the sentence completion task

By considering the general performance in the sentence completion task, namely the sentences in which just verbal agreement was required and those in which both clitic insertion and verbal agreement were required, it was found that there was no significant difference between the two groups: $U=4$ $p=.476$.

Table 3. Number and percentage of correct answers in the sentence repetition task.

stimuli	Hearing Impaired Group				Hearing Group			
	SI	S2	S3	LM	ST	VC	LT	
	33/33	100,00	33/33	100,00	33/33	100,00	33/33	100,00

Table 4. Number and percentage of correct answers in the word repetition task

	Hearing Impaired Group				Hearing Group			
	SI	S2	S3	LM	ST	VC	LT	
2 stimuli	19/20	95,00	20/20	100,00	20/20	100,00	20/20	100,00
3 stimuli	30/30	100,00	29/30	97,00	30/30	100,00	30/30	100,00
4 stimuli	20/20	100,00	19/20	95,00	20/20	100,00	19/20	95,00
6 stimuli	14/30	47,00	17/30	57,00	24/30	80,00	16/30	53,00
TOT	83/100	83,00	85/100	85,00	87/100	87,00	88/100	88,00
$\mu/\sigma\%$	$\mu=85,67$ $\sigma=3,06$				$\mu=87,50$ $\sigma=5,32$			

Table 5. Number and percentage of correct answers in the picture matching task.

	Hearing Impaired Group				Hearing Group			
	SI	S2	S3	LM	ST	VC	LT	
Morphological Sentence	15/15	100,00	15/15	100,00	15/15	100,00	15/15	100,00
Reversible Sentence	13/15	87,00	15/15	100,00	14/15	93,00	15/15	100,00
Passive Sentence	13/14	93,00	12/14	86,00	13/14	93,00	14/14	100,00
Active Sentence	15/16	94,00	16/16	100,00	16/16	100,00	16/16	100,00
TOT	28/30	93,00	28/30	93,00	29/30	97,00	30/30	100,00
$\mu/\sigma\%$	$\mu=95,33$ $\sigma=4,04$				$\mu=98,50$ $\sigma=1,73$			

However, since the aim of this research in the production task was to investigate the correct agreement between the clitic and its antecedent in both simple and compound tense sentences, and the agreement between the clitic and the past participle in compound tense sentences, the percentage of correct insertion of the clitic pronoun solely was calculated. On the whole, as we can see from Table 6, the hearing group exhibited a higher percentage of correct responses than the hearing impaired group (97.79% of correctness for the former – SD 1.53 and 94.69% for the latter – SD 2.34):

However, the Mann Whitney test did not reveal any significant difference between the two groups: $U=1$ $p=.074$.

The analysis aimed at checking the correct agreement between the clitic pronoun and its antecedent gives two different results depending on whether a simple or a compound tense was required in the sentences.

In compound tense sentences, where the participants had to insert both the clitic and the past participial verb, the average level of accuracy is above 90% for both groups, as we can see from the following table:

Even though the hearing group achieved higher scores than the hearing impaired group (HG: 99.39% – SD 1.22 – HIG: 93.45% – SD 6.27), results showed no significant difference between the two groups: $U=2.5$ $p=0.172$. The errors identified are errors of substitution of the correct morphology with the unmarked form, but the clitic always correctly agreed with the past participle in all sentences.⁸

The performance in simple tense sentences showed a very high rate of success for both groups (98,09% – SD 0.82 for the hearing group and 99,54% – SD 0.79 for the hearing impaired one).⁹

This table shows that the difference between the percentages of the two groups is quite small. Surprisingly, the impaired group performed almost at ceiling and obtained higher percentages of correct responses than the hearing one.

5.4.3. Performance in the grammaticality judgement task

A similarly unexpected result occurred in the grammaticality judgement task where the performance of the hearing impaired participants was significantly better than that of the hearing group: $U =.500$ $p =.048$. Within the hearing impaired group, two participants performed at ceiling in this task, while the third made only two errors with plural forms.

Table 6. Number and percentage of correct clitic placement in the sentence completion task.

	Hearing Impaired Group				Hearing Group			
	SI	S2	S3	LM	ST	VC	LT	
LA	25/30	27/30	27/30	29/30	25/30	30/30	30/30	100,00
LE	29/30	29/30	30/30	30/30	30/30	30/30	30/30	100,00
LO	27/28	26/28	28/28	27/28	28/28	28/28	28/28	100,00
LI	24/25	24/25	25/25	25/25	20/25	24/25	23/25	92,00
TOT	105/113	106/113	110/113	111/113	108/113	112/113	111/113	98,23
μ/σ	$\mu = 94,69$ $\sigma = 2,34$				$\mu = 97,79$ $\sigma = 1,53$			
%								

Table 7. Percentage of correct agreement between the clitics and their antecedents in the compound tense sentences in the sentence completion task.

	Hearing Impaired Group				Hearing Group			
	SI	S2	S3	LM	ST	VC	LT	
LA	9/13	11/11	10/13	15/15	13/14	16/16	18/18	100,00
LE	11/11	11/11	11/11	11/11	12/12	13/13	12/12	100,00
LO	9/9	7/7	8/8	6/6	9/9	10/10	10/10	100,00
LI	6/7	7/7	10/10	7/7	6/6	9/9	9/9	100,00
TOT	35/40	36/36	39/42	39/39	40/41	48/48	49/49	100,00
μ/σ	$\mu = 93,45$ $\sigma = 6,27$				$\mu = 99,39$ $\sigma = 1,22$			
%								

Table 8. Percentage of correct agreement between the clitics and their antecedents in simple tense sentences in the sentence completion task.

	Hearing Impaired Group						Hearing Group							
	SI	S2	S3	LM	ST	VC	LT	VC	ST	LT				
LA	17/17	100,00	15/15	100,00	17/17	100,00	14/15	93,33	11/11	100,00	14/14	100,00	12/12	100,00
LE	19/19	100,00	18/18	100,00	19/19	100,00	19/19	100,00	18/18	100,00	17/17	100,00	18/18	100,00
LO	17/18	94,44	18/18	100,00	19/19	100,00	20/20	100,00	17/17	100,00	17/17	100,00	17/17	100,00
LI	19/19	100,00	17/17	100,00	16/16	100,00	19/19	100,00	16/17	94,12	16/17	94,12	15/17	88,24
TOT	72/73	98,63	68/68	100,00	71/71	100,00	72/73	98,63	62/63	98,41	64/65	98,46	62/64	96,88
μ/σ	$\mu = 99,54$						$\mu = 98,09$						$\sigma = 0,82$	
%	$\sigma = 0,79$													

Table 9. Percentage of correct answers in the grammaticality judgement task.

	Hearing Impaired Group						Hearing Group							
	SI	S2	S3	LM	ST	VC	LT	VC	ST	LT				
LA	16/16	100,00	16/16	100,00	16/16	100,00	16/16	100,00	15/16	93,75	16/16	100,00	16/16	100,00
LE	13/13	100,00	13/13	100,00	12/13	92,31	12/13	92,31	13/13	100,00	12/13	92,31	12/13	92,31
LO	28/28	100,00	28/28	100,00	28/28	100,00	26/28	92,86	27/28	96,43	26/28	92,86	28/28	100,00
LI	23/23	100,00	23/23	100,00	22/23	95,65	20/23	86,96	23/23	100,00	22/23	95,65	22/23	95,65
TOT	80/80	100,00	80/80	100,00	78/80	97,50	74/80	92,50	78/80	97,50	76/80	95,00	77/80	96,25
μ/σ	$\mu = 99,16$						$\mu = 95,31$						$\sigma = 2,13$	
%	$\sigma = 1,44$													

The lower performance of the hearing group compared with the hearing impaired one is mainly concerned with the incorrect judgement of those items containing a plural subject and the third person singular form of the auxiliary.¹⁰ Some hearing participants have judged as correct a sentence like (13), where a mismatch error between the plural subject and the singular auxiliary is present:

- (13) *I giardinieri, gli alberi, li ha potati.
The gardeners, the trees, them:CL has pruned
'The gardeners have pruned the trees.'

This phenomenon is probably related to the fact that these hearing participants use the Venetan dialect as their first language and are influenced by it when speaking Italian. In the dialect, the verb has the same form in the singular and the plural, and this form resembles the singular form of Italian:

- (14) I giardinieri, i alberi, (i) li ga potai.
The gardeners, the trees, (Subj.CL) them:CL has pruned

The correct Italian sentence is:

- (15) I giardinieri, gli alberi, li hanno potati.
The gardeners, the trees, them:CL have pruned

5.4.4. *Performance in the different combinations of gender and number features*

A non-parametric related sample test (Wilcoxon) was carried out in order to compare the use of gender and number features of clitic pronouns in the sentence completion and in the grammaticality judgement tasks, to determine whether participants could be more sensitive to the manipulation of sentences containing a specific gender and/or number feature. The following comparisons were thus carried out, first considering the opposition between single clitics (16) and then the opposition between pairs of clitics (17) separately in the two different tasks:

- (16)
- masculine singular vs. feminine singular (lo vs. la)
 - feminine singular vs. feminine plural (la vs. le)
 - masculine plural vs. feminine plural (li vs. le)
 - masculine singular vs. masculine plural (lo vs. li),

(17)

- masculine vs. feminine (lo+li vs. la+le)
- singular vs. plural (la+lo vs. li+le)

Figure 1 shows the percentage of correct answers of the whole group for each clitic pronoun and separately for each of the two main tasks (sentence completion task and grammaticality judgement task). In the elicited production task, plural clitics *li* and *le* have the highest rate of accuracy. The situation is inverted in the grammaticality judgement task, where items with singular forms *lo* and *la* show a higher rate of success with respect to the plural ones *li* and *le*.

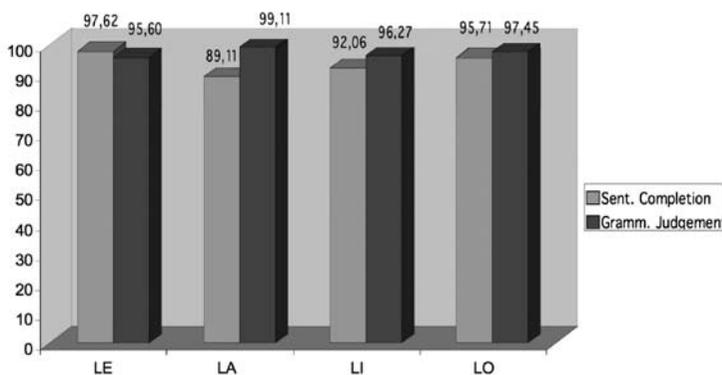


Figure 1. Percentage of correct responses per clitic pronoun for each of the two main tasks considering all participants.

In the grammaticality judgement task, the greatest number of errors with plural clitics concerns the mismatch between the subject and the auxiliary (see section 5.4.3. example (13)). For this reason, only results on the sentence completion task will be considered from here on.

By examining the accuracy of single clitics within the whole group (hearing and hearing impaired groups) using the Wilcoxon test, a significant difference is attested in the elicited production of accusative clitics regarding the opposition between feminine singular (*la*) and feminine plural (*le*): $Z=-2.032$ $p=0.042$. In the grammaticality judgement task, no significant difference is noticed.

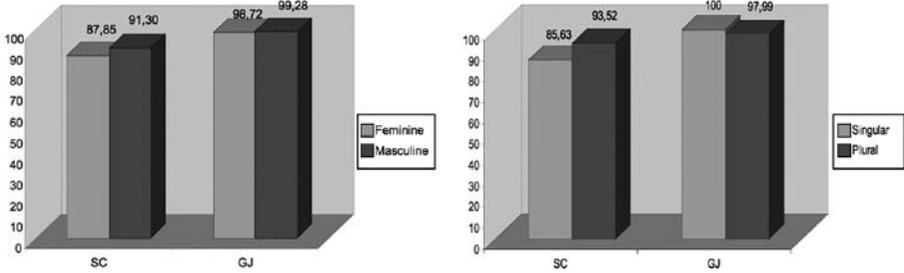


Figure 2. Number and gender clitic opposition in the two main tasks within the hearing-impaired group.

In the sentence completion task, in those items requiring a compound tense, the opposition between pairs of clitics was also analyzed to determine whether some features (gender and/or number) could be performed better than others. By considering the whole group of participants, no significant difference was attested in the discrimination between singular and plural and between masculine and feminine features. As far as number features are concerned, the lack of significance is due to the fact that the hearing group achieved higher scores on singular than on plural features, while the hearing impaired group showed the reversed pattern (see figure 3):

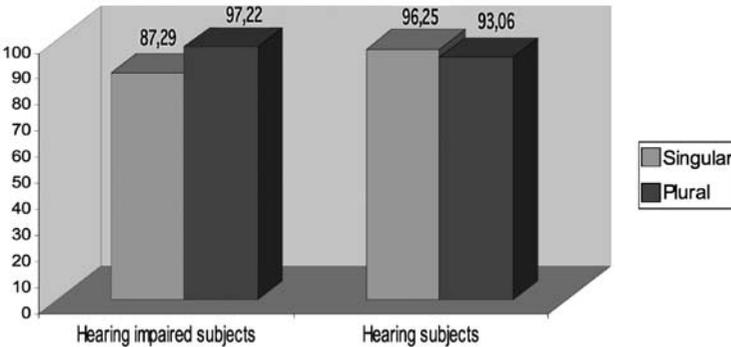


Figure 3. Opposition between singular and plural features in each group of participants.

By considering only the hearing impaired group, a significant difference is attested in the discrimination between plural and singular (*li-le > la-lo*): $Z = -2.032$ $p = 0.042$.

To summarize all results, a between-group analysis revealed that in the sentence completion task, no significance is attested between the two groups of participants, while in the grammaticality

judgement task the hearing impaired group performed significantly better than the control group. Interesting findings have emerged from a within-group analysis, in which the performance in the different combinations of gender and number features in the sentence completion task was considered. Contrary to what one could expect, results demonstrate a clear predominance of correctness rate in sentences requiring plural features, and sometimes specifically feminine plural features.

Before looking at the linguistic theories that could help us explain such behaviour, let us examine more closely the type of errors that the two groups of participants made.

5.5. The relevant errors

5.5.1. The hearing impaired group

The performance of the three hearing impaired participants showed an overall high level of accuracy in the responses they provided and the number of errors made by them is very low, proving that impairment is very selective. Since errors are quantitatively few, the most interesting observations and generalizations can be drawn from the analysis of the data obtained in the sentence completion task and this section attempts to give an explanation for the non standard forms produced by the subjects.

The errors produced by participants can be divided into two main typologies:

- omission of the clitic pronoun and use of the unmarked form of the past participle¹¹
- substitution of the correct gender and number morphology with the unmarked one, i.e. masculine singular¹²

The hypothesis explaining the first type of errors would be the retrieval of a post-verbal null object pronoun (*pro*) instead of a clitic pronoun. The existence of this null object pronoun has already been proven for Italian by Rizzi (1986) in sentences like (18), where ‘*pro*’ is licensed by V and is assigned an arbitrary interpretation:

- (18) Un medico serio visita *pro*_i nudi_i
A serious doctor visits *pro*_i unclothed:M.PL_i

The null object retrieval hypothesis has also been proposed by Tuller (2000) for French hearing impaired individuals. Although the presence of this null object pronoun is illicit in the corpus produced by the subjects she tested, the French spoken language does not

exclude the occurrence of this element in some specific contexts (for example, in her account, when corresponding to sufficiently salient topics).

In the CLLD sentences administered in the sentence completion task, the participants omit the clitic because they presumably retrieve the weak pronominal element in the canonical object position, which is not correct in the corpus they produce, but which is nonetheless licit in the particular structure of Italian seen in (18).¹³ (In (19) and throughout, the underlined words are those produced by the participants):

- (19) *La lezione_i, il professore aveva spiegato pro_i due volte, perché i ragazzi non avevano capito niente.

The:F.SG lesson:F.SG, the teacher had explained:M.SG.(default) pro twice, because the students had not understood anything.

'The teacher explained the lesson twice, because the students did not understand anything.'

These sentences have the same structure as those administered in the experiment carried out in Volpato (2002), where the same kind of error has also been made by the two hearing impaired participants FR and GR¹⁴.

It should be noted that the unmarked form of the past participle in (19) (*spiegato* 'explained:M.SG') excludes another potential analysis, namely that the clitic pronoun is simply non-overt. If a clitic pronoun were present in the syntactic derivation, we could expect the agreeing form of the past participle (*spiegata* 'explained:F.SG'). This corresponds with Cardinaletti's (2002) conclusions that null clitic pronouns do not exist.

Turning our attention now to the substitution error, we find that it usually occurred when a compound tense and the feminine singular clitic were required. In this case, the hearing impaired participants use the default morphology on the past participle, as the following example shows:

- (20) *La cena per i bambini, la mamma l'ha preparato prima di andare al ristorante.

The:F.SG. dinner:F.SG. for the children, the:F.SG mother:F.SG it:CL has prepared:M.SG, before going to the restaurant.

'The mother prepared dinner for the children, before going to the restaurant.'

This sentence is ungrammatical because the past participle does not correctly agree in gender with the left dislocated constituent (target: *La cena (...) la mamma l'ha preparata* 'The:F.SG. dinner:F.SG. (...), the:F.SG mother:F.SG it:CL has prepared:F.SG'). Looking only at the clitic, it is not clear whether it is in the masculine or the feminine form, because with compound tenses, the gender feature is not overtly marked on the clitic pronoun and the elided form (*l*) is correct both for the masculine and the feminine singular (*l'ha preparato/l'ha preparata*). However, since it is evident from the our earlier analysis that the tested participants always make the clitic correctly agree with the past participle, I assume that in this case, the clitic and the past participle also share the same gender feature (masculine singular *o*). Hence it follows that the feminine singular form has been replaced by the unmarked one (masculine singular). It is worth pointing out that this substitution occurs mainly when a singular feminine NP is present (it occurs only once with the masculine plural).¹⁵

The aspect that is common to both types of errors – omission and substitution – is that both the object 'pro' in (19) and the occurrence of the unspecified clitic *l* in (20) always trigger the default past participle agreement (*o*).

5.5.2. The control group

By turning our attention to the performance of the control subjects, it is worth pointing out that the sentences they produced also include some errors and non-standard forms. The type of error occurring in their performance and which also occurs in the hearing impaired group is the omission of the clitic in a very small amount of items.

Apart from the omission errors like those described above, there are non-standard forms that occur only in some sentences produced by two of the hearing participants. In these cases, as far as gender and number features are concerned, the clitic they choose is undoubtedly correct (*la* feminine singular), but the full form they use is not acceptable in the standard language, since only the elided form of this clitic is grammatical.¹⁶ This kind of error is illustrated in (21):

- (21) **La valigia, il facchino dell'hotel la ha portata* in camera.
the suitcase:F.SG., the porter of-the hotel it:CL.F has brought into the room
'The hotel porter brought the suitcase into the room.'

In the standard language, the correct form of this sentence would be as in (22), where the gender feature is not overtly marked on the clitic pronoun:

(22) La valigia, il facchino dell'hotel l'ha portata in camera.

What is worth observing is that this error occurs mainly in those participants who habitually speak the Venetan dialect during daily interactions with family and friends.¹⁷ Since sentences like (21) are not accepted in Standard Italian, it is thus possible that control subjects are using a form of hypercorrection that has been influenced by the Venetan dialect, where the finite form of the auxiliary verb 'have' has a different phonetic and phonological content with respect to that of the Italian form. In the Venetan dialect, the third person indicative present auxiliary is realized as *ga*, thus forcing the presence of the non-elided feminine singular clitic form:

(23) A vaisa, el fachin (...) la ga portata...

The following paradigms are found in Italian and in the dialect:

(24)

STANDARD ITALIAN	VENETAN DIALECT
lo ha / l'ha	lo ga
l'ha	la ga
li ha	li ga
le ha	li ga
le ha	le ga

Table 10 summarizes the different types of errors made by both groups of participants in the sentence completion task:

Table 10. Type of errors in the sentence completion task for both groups.

TYPE OF ERRORS	EXAMPLE	GROUP
Omission Use of unmarked p.p. morphology	*La lezione, il professore <i>aveva spiegato</i> due volte The.f.sg. lesson.f.sg., the teacher had explained.m.sg. twice	Hearing impaired group / Hearing group
Substitution Use of unmarked morphology	*La cena per i bambini, la mamma <i>l'ha preparato</i> The.f.sg. dinner.f.sg. for the children, the.f.sg. mother.f.sg. it.cl has prepared. m.sg.	Hearing impaired group
Hypercorrection (influence of Venetan dialect) Use of the full feminine form	*La valigia, il facchino dell'hotel <i>la ha portata</i> in camera The suitcase.f.sg. the porter of-the hotel it.cl.f. has brought into the room	Hearing group

To account for the substitution errors, the next section will offer some explanations on how gender and number features are represented and processed in clause structure.

6. Discussion: gender and number features on clitic pronouns

The results and the error typologies explained in the previous sections reveal that the level of accuracy of the three hearing impaired individuals on the proposed structures is quite high.

The correct production and placement of most clitics, mainly in simple tense sentences, is clear evidence that left dislocation itself does not represent a problem for hearing impaired individuals and, despite some errors, all the nodes of the syntactic tree are correctly projected in the grammar of these participants. Because of a widely attested presence of clitic pronouns in most sentences, the reason for omission and substitution errors must be found elsewhere.

As already explained in section 4, CLLD involves the preposing of a constituent that is linked to its argument/canonical position. The left dislocated XP, pronounced without any stress and associated with already known information, co-occurs with a coreferential clitic pronoun with which it shares number and gender features.

Although limited in number, most errors produced by the hearing impaired participants are found in compound tense sentences, where past participle agreement in gender and number with clitic pronouns is also required. The difficulties that the subjects encountered with gender and number markers lead us to discuss the errors present in the corpus within the framework of the current research on ϕ -features.

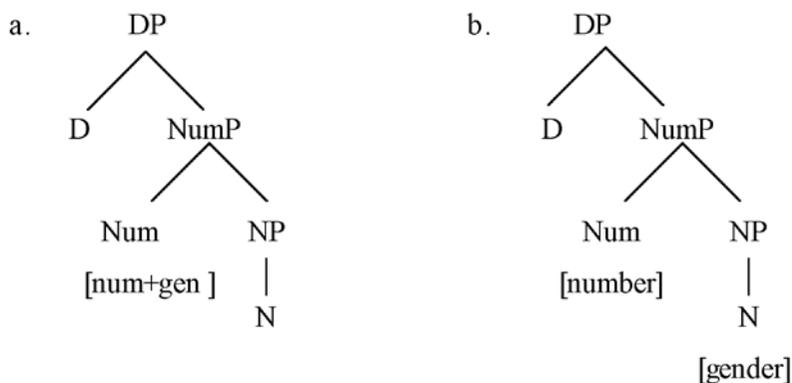
What is most relevant to the aim of this discussion is that the data collected during the experiment showed a significant difference in the occurrence and use of the four accusative clitic pronouns, proving a better performance on those marked with plural (number) features as opposed to singular ones. This evidence on the different nature and behaviour of clitic pronouns thus contributes to strengthen some syntactic, morpho-phonological and psycholinguistic proposals that account for the triggering force of number on gender. These proposals will form the topics for discussion in the next sections.

6.1. The syntactic proposal

On the basis of the data and the results obtained from the experiment, it is clear that the participants' performance varies according to specific features displayed by clitic pronouns. We now discuss how these features are represented syntactically. Harris (1991), Kayne (2000) and Ferrari (2005) suggest that third person accusative clitics are complex elements that can be split into two distinct morphemes: the consonantal morpheme *l* without specific characterization for gender and/or number, and the relevant gender and number marker (1+o, 1+a, 1+i, 1+e). Although these features appear to behave in the same way, there seems to be an underlying asymmetry in the way number and gender are specified on the morpheme *l*.

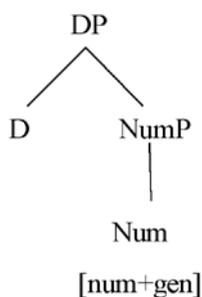
Much linguistic literature is devoted to the description of the way gender and number features are encoded and represented in the syntactic tree. Ritter (1995) and Di Domenico (1997) postulate that gender information is encoded differently from number information and consequently it is represented structurally in a different manner. For languages such as Hebrew, Ritter (1995) proposes that gender is a feature of N (25b), because it appears on the noun stem at all representational levels, while in Romance languages, gender is part of the number phrase (25a), as the following representations show:

(25)



Di Domenico (1997) offers a slightly different structural analysis for Italian, by distinguishing between the representation of grammatical gender and that of semantic gender. Grammatical gender is part of the lexical entry of the noun (as in (25b)), while semantic gender is projected together with number under NumP (as in (25a)). Both authors assume that number projects its own syntactic head. The noun phrase has a plural denotation only when the number suffix heads a distinct functional projection. As far as pronouns are concerned, since they lack the NP projection, gender is specified on and projected with number:

(26)



In summary, number is a syntactic head, separately represented in the lexicon and autonomously projected in syntax, while gender is projected in syntax either with number (see (25a) and (26)) or with the noun (see(25b)).

The syntactic analysis of the Italian nominal system suggested by Ferrari (2005) strongly corroborates the structure proposed by Ritter (1995), by convincingly arguing that plural features are realized by Merge of a further projection (NumP) into the clause structure. In Ferrari’s proposal, Number is projected only in the plural and not with singular features. The assumption that the number projection is present only in the plural has strong consequences for the representation of gender features. However, this issue will not be addressed in this paper but will be further developed in future work.

6.2. The morpho-phonological proposal

Gender and number markers in third person accusative clitics are suppressed under certain conditions. Let us examine the data in Table 11 concerning the occurrence of clitic pronouns with simple tenses:

Table 11. Form of clitic pronoun with simple tenses.

LO		LA	
lo amo	*l’amo	la amo	*l’amo
lo ami	*l’ami	la ami	*l’ami
lo ama	*l’ama	la ama	*l’ama
lo amiamo	*l’amiamo	la amiamo	*l’amiamo
lo amate	*l’amate	la amate	*l’amate
lo amano	*l’amano	la amano	*l’amano
LI		LE	
li amo	*l’amo	le amo	*l’amo
li ami	*l’ami	le ami	*l’ami
li ama	*l’ama	le ama	*l’ama
li amiamo	*l’amiamo	le amiamo	*l’amiamo
li amate	*l’amate	le amate	*l’amate
li amano	*l’amano	le amano	*l’amano

The data on *lo* and *la* are from the Venetan variety of Italian. The elided forms of *lo* and *la* are ungrammatical. Other Italian varieties allow that in simple tenses, the singular masculine and feminine markers can be suppressed in front of verbs beginning with a vowel. In other words, overt markedness is not obligatory with singular forms, and sometimes the morpheme *l* can appear instead of the bimorphemic *lo* and *la*. Garrapa (2007) claims that dorsal word-final vowels are not likely to drop if they are not recoverable from the con-

text, as in *la amo* ‘I love her’, *lo amo* ‘I love him’, although the elided form might also be acceptable. In clitics specified for plural features, coronal vowels /i/ and /e/ are instead always preserved.¹⁸

Things are slightly different with compound tenses, in which both an auxiliary and the past participial verb appear, and therefore gender and number features are marked both on the clitic pronoun and on the past participle morphology. The occurrence of object clitics is illustrated in the following table:

Table 12. Form of clitic pronouns with compound tenses.

LO		LA	
*lo ho visto	l’ho visto	*la ho vista	l’ho vista
lo hai visto	l’hai visto	*la hai vista	l’hai vista
lo ha visto	l’ha visto	*la ha vista	l’ha vista
lo abbiamo visto	l’abbiamo visto	*la abbiamo vista	l’abbiamo vista
lo avete visto	l’avete visto	*la avete vista	l’avete vista
lo hanno visto	l’hanno visto	*la hanno vista	l’hanno vista

LI		LE	
li ho visti	*l’ho visti	le ho viste	*l’ho viste
li hai visti	*l’hai visti	le hai viste	*l’hai viste
li ha visti	*l’ha visti	le ha viste	*l’ha viste
li abbiamo visti	*l’abbiamo visti	le abbiamo viste	*l’abbiamo viste
li avete visti	*l’avete visti	le avete viste	*l’avete viste
li hanno visti	*l’hanno visti	le hanno viste	*l’hanno viste

In compound tenses, accusative clitic pronouns behave differently from each other according to the features they possess. Table 12 shows that in clitics marked as [+plural], \emptyset -features are always visible on the morpheme *l*, while singular clitics undergo vowel deletion. In particular, clitics specified for [feminine] gender, are ungrammatical in the non-elided form, while masculine are grammatical both in the elided and in the non-elided form.

On the basis of data collected from informants speaking a northern variety of Standard Italian (spoken in Lecco), Garrapa (2007) proposes the Vowel Deletion Scale presented in (27):

(27) a > o > i > e¹⁹

This implicational scale is applicable to accusative clitic pronouns both in simple and compound tenses. In order to try to gen-

eralize on this phenomenon, it is possible to infer that plural clitics always appear with gender and number features overtly marked on the morpheme *l*, while for singular clitics the occurrence varies according to different factors. Morphemes that realize the Num head cannot be elided. This thus seems to represent the triggering element. The accurate performance with plural clitics that we have observed in the hearing impaired individuals seems to be due to this morpho-phonological visibility.

6.3. The psycholinguistic proposal

The syntactic and the morpho-phonological analyses, which account for the specification of gender and number markers on clitic pronouns, have strong consequences for the development of a psycholinguistic proposal related to the processing of these features.

As we have seen in 6.1., the presence of number specification [+plural] involves the activation of a further syntactic projection (NumP) with respect to singular markers (Ferrari 2005). It is worth remembering that economy principles tend to lead speakers to perform the least costly operations, thus forcing them to choose the structure containing unmarked forms, not involving the NumP projection.²⁰ Although the choice of the unmarked form is indeed the strategy preferred by the hearing impaired individuals in substitution errors, it is evident that in the different combinations of ϕ -features, the participants nonetheless showed a higher level of accuracy on plural rather than on singular forms.

According to the approaches developed by Ritter (1995) and Di Domenico (1997), the different linguistic representation of the two features is relevant because, since gender is not a head with its own functional projection, it is not visible to the syntactic parser. This phenomenon has strong consequences on the interpretation of elements containing both features. From a psycholinguistic point of view, by assuming a modular theory of language processing, gender information is used by the parser later than number information since, according to Kimball (1973) and Frazier (1985), the syntactic processor uses only the information relevant to the syntactic level of analysis, in order to assign a structural representation to the input. Therefore, at this initial processing stage only those features that project autonomously in syntax and that are more visible from a morpho-phonological point of view will be easily recognized and computed by the parser. Hence, since only number features head their own syntactic projection, only number information would be used to establish

a co-reference between the noun and the pronoun. Gender information, although overtly marked on the noun, should not be available at the same extent as number information.²¹

The validity of this approach has been confirmed by the findings of an experiment run by De Vincenzi & Di Domenico (1999) exploring the processing of gender and number features in the retrieval of pronoun antecedents in Italian. This experiment proves that number features constitute the morphological information that is firstly used to select a pronoun antecedent. In contrast, gender information does not have the same reactivation effect as that deriving from number information.

The conclusion drawn by De Vincenzi & Di Domenico (1999) is confirmed by the analysis of the data gathered from the present experiment on the three hearing impaired individuals. Indeed this experiment supports the hypothesis of the difference in the use of gender and number information on clitic pronouns, clearly proving that number information is retrieved earlier than gender information and thus justifying the better performance in sentences containing clitics specified for plural features compared with those specified for singular ones.

7. Conclusion

In this paper we have analysed the competence of third person accusative clitic pronouns in CLLD by hearing impaired individuals. The presence of high scores in the performance of the hearing impaired group (sometimes higher than those of the control group) leads to the conclusion that the impairment is very limited and that the linguistic competence is quite intact. The results are nonetheless useful to shed light on some linguistic aspects that confirm previous linguistic findings concerning ϕ -features.

The collected data confirm the different status of the four third-person accusative clitic pronouns according to the combination of gender and number features. When gender features are not visible on the pronoun because the vowel is elided, as in the feminine singular, gender features are not accessible. On the other hand, gender features are always accessible in the plural. This proves that it is easier to produce those forms the structure of which is complex from a morpho-syntactic point of view, i.e. structures specified for plural features ([i], [e]). In contrast, clitic pronouns specified for singular features ([o], [a]) are difficult not only from a morphological and syntactic point of view

but also from a phonological one, because they may lack overt realization. Furthermore, since these features do not project autonomously in syntax, they are computed with difficulty and are hardly visible to the syntactic processor. Hence, consistently with a modular theory of language processing, individuals find it easier to produce the structure that is syntactically more complex, with the greatest number of checked visible features, because they have more evidence of it, thus confirming a triggering force for plural number features as opposed to singular ones, and thus proving that morphosyntactic and psycholinguistic perspectives converge onto the same conclusions.

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Notes

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¹ Although the individuals analysed in Chesi (2000, 2006) and Volpato (2002) are all hearing impaired, it is worth considering that the population of deaf people is extremely heterogeneous and that many factors influence the development of language by these individuals (age at onset of hearing loss, degree of hearing loss, use of hearing aids, duration of use of hearing aids, etc.). The heterogeneity within this population makes it difficult to carry out a straightforward comparison between the samples involved in these studies. For this reason, the explanation for such variability and for the difference in performance between the groups is not addressed in this paper.

² Actually, children who learn a second language sometimes tend to transfer the parametric settings of the first language to the grammar of the second language, giving rise to non-target-like performance. In this case, therefore, the influence of one of the two underlying grammatical systems allows a unique analysis of object pronouns for both languages thus allowing object clitics to occupy positions where, in one of the two languages, only lexical DPs or strong pronouns are usually placed.

³ The aim of this paper is not to give support to one or the other hypothesis and for this reason, the movement hypothesis will only be adopted for the sake of the presentation.

⁴ In most recent theories (Chomsky 1995), the AgrO projection is no longer assumed, but the projection responsible for past participle agreement is still present in clause structure.

⁵ According to BIA (Bureau International d'Audiophonologie), four categories of hearing loss are recognized: mild (26 to 40 dB), moderate (41 to 70 dB), severe (71 to 90 dB) and profound (greater than 91 dB). In the hearing impaired group, a participant with moderate hearing impairment (S1) was also included. However, it is worth considering that S1, having 70 dB hearing loss, is at the upper limit of moderate impairment, very close to the severe one, and that someone with an audiological hearing loss of 70 dB, without hearing aids, may functionally be considered as profoundly deaf (Baker et al. 2005). Although most studies focus on severe-to-profound deafness, some recent research mainly concerned with mild-to-moderate hearing loss proved that even low degrees of hearing impairment may be crucial and prevent individuals from developing a complete linguistic competence (Delage & Tuller 2007).

⁶ Although the hearing-impaired participants were tested through the written modality, the proposed tasks aim at investigating the more general linguistic competence of the Italian language, and not specifically the competence in the written language.

⁷ Although in some sentences the production of a compound tense was expected, the production of a different tense was also considered correct.

⁸ For a more detailed account of this type of error, see section 5.5.1.

⁹ Some errors are due to the use of an incorrect tense in the main clause. Since the aim of this study is mainly the analysis of the correct insertion and agreement of the clitic pronoun with its antecedent and with the past participle, the tense errors (*consecutio temporum*) are not considered and accounted for in this paper. I included the results here for completeness.

¹⁰ Since the present analysis focuses on the use of gender and number morphology, the person mismatch between the subject and the finite verb is not considered, but results have however been included for an overall account of the performance.

¹¹ Omission errors are rarely attested in simple tense sentences, the omission rate is higher in those requiring a compound tense.

¹² Following Pretto (1985), I assume that, in Italian, masculine is the unmarked default gender and feminine is the marked gender.

¹³ An anonymous reviewer has pointed out that these left-dislocation sentences might have been mentally rehearsed by the participant as associated with a contrastive focus intonation:

(i) LA LEZIONE, il professore aveva spiegato due volte

THE LECTURE, the professor had explained twice

In this way, it would be incorrect to consider them as ungrammatical.

Actually, sentences like (i) might be acceptable in particular contexts, such as contrastive focus. However, in 'out-of-the-blue' contexts the contrastive intonation has to be excluded, and for this reason, sentences like (19) have been considered as incorrect.

¹⁴ In the present experimental investigation, the omission of the clitic pronoun is also attested in some sentences filled in by the hearing group.

¹⁵ The same tendency has been identified by Cipriani et al. (1993) in typically-developing children at early stages of language acquisition. From the 24th to the 31st month of age, when children begin to use clitics productively, they substitute some forms with some others in the preverbal position (rarely in the postverbal position). The most common error typologies are those concerning gender features (*lo* instead of *la*) and number feature (*lo* instead of *li*).

¹⁶ For a more detailed morpho-phonological account explaining the occurrence of the different clitic forms, see section 6.2.

¹⁷ The same error is also performed by one of the control subjects (CTRL2) in Volpato (2002). This participant as well speaks a variety of the Venetan dialect and uses it habitually.

¹⁸ In some linguistic varieties of central and southern Italy, the 'reduced' form of the plural clitics *l* in compound tenses sometimes occurs (Garrapa to appear a and b). The subjects of my experiment all speak Northern varieties, in which the data in tables 1 and 2 hold.

¹⁹ '>' means more frequently elided.

²⁰ The expression 'economy principles' is intended here in wide sense, as simplicity of representation, on the basis of which people are led to choose the simplest numeration.

²¹ To support the different degree of salience that gender and number features have, the implicational relations to one another is predicted by the Feature Hierarchy proposed by Carminati (2004):

(i) (Person) > Number > Gender

showing that number plays a greater role in the disambiguation of pronouns than gender. This evidence thus supports all proposals that assign these features a different grammatical status in the core syntax.

Bibliographical References

- AJELLO Roberto, Giovanna MAROTTA, Laura MAZZONI & Florida NICOLAI 2001. Morphosyntactic fragility in the spoken and written Italian of the deaf. In FAVA Elisabetta (ed.). *Clinical Linguistic*. Vol. 1. 101-117.
- BAKER Anne, Beppie VAN DEN BOGAERDE AND Woll BENCIE 2005. Methods and procedures in sign language acquisition studies. *Sign Language & Linguistics* 8. 7-60.
- BELLETTI Adriana 1999. Italian/Romance clitics: Structure and derivation. In Van Riemsdijk 1999. 543-579.
- BELLETTI Adriana 2005. Extended doubling and the VP periphery. *Probus* 17. 1-35.
- BENINCA Paola 1988/2001. L'ordine degli elementi della frase e le costruzioni marcate. In RENZI Lorenzo (ed.). *Grande grammatica di consultazione*. Bologna: Il Mulino. Vol. 1. 115-225.
- BORTOLINI Umberta, Barbara ARFÉ, M. Cristina CASELLI, Luisa DEGASPERI, Patricia DEEVY & Laurence B. LEONARD 2006. Clinical markers for specific language impairment in Italian: the contribution of clitics and non-word repetition. *International Journal of Language Communication Disorders* 41. 695-712.
- CARDINALETTI Anna & Michal STARKE 1999. The typology of structural deficiency: A case study of the three classes of pronouns. In Van Riemsdijk 1999. 145-233.
- CARDINALETTI Anna 2002. Against optional and zero clitics. Right Dislocation vs. Marginalization, *Studia Linguistica* 56. 29-57.
- CARMINATI Maria Nella 2004. Processing reflexes of the Feature Hierarchy (Person > Number > Gender) and implications for linguistic theory. *Lingua* 115. 259-285.
- CECCHETTO Carlo 1999. A comparative analysis of left and right dislocation in Romance. *Studia Linguistica* 53. 40-67.

- CHESI Cristiano 2000. *Inferenze Strutturali. Analisi sull'uso degli elementi funzionali nelle produzioni verbali dei bambini sordi*. Siena: University of Siena. Graduation thesis.
- CHESI Cristiano 2006. *Il linguaggio verbale non-standard dei bambini sordi*. Roma: Edizioni Universitarie Romane.
- CHOMSKY Noam 1993. A minimalist program for linguistic theory. *MIT Occasional Papers in Linguistics* 1. Cambridge, MA: MIT Press.
- CHOMSKY Noam 1995. *The Minimalist Program*. Cambridge, MA: MIT Press.
- CINQUE Guglielmo 1977. The movement nature of left dislocation. *Linguistic Inquiry* 8. 397-412.
- CINQUE Guglielmo 1990. *Types of A'-dependencies*. Cambridge, MA: MIT Press.
- CIPRIANI Paola, Anna Maria CHILOSI, Piero BOTTARI, & Lucia PFANNER 1993. *L'acquisizione della morfosintassi in Italiano: fasi e processi*. Padova: Unipress.
- DELAGE H el ene & Laurice TULLER 2007. Language Development and Mild-to-Moderate Hearing Loss: Does Language Normalize with age? *Journal of Speech, Language, and Hearing Research* 50. 1300-1313.
- DE VILLIERS Jill G., Peter A. DE VILLIERS & Esme HOBAN 1994. The central problem of functional categories in the English syntax of oral deaf children. In TAGER-FLUSBERG Helen (ed.). *Constraints on Language Acquisition: Studies of Atypical Children*. Hillsdale, NJ: Erlbaum. 9-47.
- DE VINCENZI Marica & Elisa DI DOMENICO 1999. A distinction among ϕ -features: the role of gender and number in the retrieval of pronoun antecedents. *Rivista di Linguistica* 11. 41-74.
- DI DOMENICO Elisa 1997. *Per una teoria del genere grammaticale*. Padova: Unipress.
- FABBRETTI Daniela 2006. La scrittura delle persone sorde. In Fabbretti & Tomasuolo. 63-81.
- FABBRETTI Daniela, Virginia VOLTERRA & Clotilde PONTECORVO 2006. Una ricerca sull'italiano scritto da persone sorde adulte. In Fabbretti & Tomasuolo 2006. 97-116.
- FABBRETTI Daniela, Elena TOMASUOLO (eds.) 2006. *Scrittura e Sordit a*. Roma: Carocci Editore.
- FABBRETTI Daniela, Virginia VOLTERRA & Clotilde PONTECORVO 1998. Written language abilities in Deaf Italians. *Journal of Deaf Studies and Deaf Education* 3. 231-244.
- FERRARI Franca 2005. *A Syntactic Analysis of the Nominal Systems of Italian and Luganda: How Nouns Can Be Formed in the Syntax*. New York: New York University. PhD Dissertation.
- FRANCHI Elisa 1998. *Nel mondo dei sordi. Un cammino verso il linguaggio. Il ruolo delle categorie funzionali e della logogenia*. Venice: Universit a Ca' Foscari Venezia. Graduation thesis.
- FRAZIER Lyn 1985. Modularity and the representational hypothesis. In Stephen BERMAN, Jae-Wdong CHOE & Joyce McDONOUGH (eds.). *Proceedings of North Eastern Linguistic Society* 15. Amherst, MA: Graduate Linguistics Students Association. 131-144.

- FRIEDEMANN Mark A. & Tal SILONI 1997. Agr_{obj} is not Agr_{participle}. *The Linguistic Review* 14. 69-96.
- GARRAPA Luigia 2007. Vowel Elision in two varieties of spoken Italian is constrained by Morphology. Universität Konstanz: Fachbereich Sprachwissenschaft. Arbeitspapier Nr. 121.
- GARRAPA Luigia. To appear (a). Vowel elision in spoken Florentine Italian. In TOCK Daniele & W. Leo WETZELS (eds.), *Romance Languages and Linguistic Theory 2006*. Amsterdam: John Benjamins.
- GARRAPA Luigia. To appear (b). L'elisione vocalica ai confini di parola nel fiorentino parlato e l'interazione fra morfologia, fonologia, frequenza d'uso e variazione di registro. *Actes du XXV CILPR* (Innsbruck 2007 September 3-8).
- HAMANN Cornelia & Adriana BELLETTI 2006. Developmental patterns in the acquisition of complement clitic pronouns: Comparing different acquisition modes with an emphasis on French. *Rivista di Grammatica Generativa* 31. 39-78.
- HARRIS James W. 1991. The exponence of gender in Spanish. *Linguistic Inquiry* 22. 27-62.
- JAKUBOWICZ Celia, Lea NASH, Catherine RIGAUT & Christophe-Loïc GÉRARD 1998. Determiners and clitic pronouns in French-speaking children with SLI. *Language Acquisition* 7. 113-160.
- KAYNE Richard 1989. Facets of Romance past participle agreement. In BENINCÀ Paola (ed.), *Dialect Variation and the Theory of Grammar*. Dordrecht: Foris. 85-103.
- KAYNE Richard 1991. Romance clitics, verb movement and PRO. *Linguistic Inquiry* 22. 647-686.
- KAYNE Richard 2000. Person morphemes and reflexives in Italian, French and related languages. In KAYNE Richard. *Parameters and Universals*. Oxford: Oxford University Press. 131-162.
- KIMBALL John P. 1973. Seven principles of surface structure parsing in natural language. *Cognition* 2. 15-47.
- LEONARD B. Laurence, M. Cristina CASELLI, Umberta BORTOLINI, Karla K. MCGREGOR & Letizia SABBADINI 1992. Morphological deficits in children with specific language impairment: The status of features in the underlying grammar. *Language Acquisition* 2. 151-179.
- MICELI Gabriele, Alessandro LAUDANNA, Cristina BURANI & Rita CAPASSO 1994. *BADA. Batteria per l'Analisi dei Deficit Afasici*. CEPSAG. Roma: Università Cattolica Sacro Cuore.
- PIRVULESCU Mihaela 2006. The acquisition of object clitics in French L1: Spontaneous vs. elicited production. In Adriana BELLETTI, Elisa BENNATI, Cristiano CHESI, Elisa DI DOMENICO & Ida FERRARI (eds.), *Language Acquisition and Development*. Proceedings of GALA2005. Cambridge: Cambridge Scholars Press. 450-462.
- PRETTO Annamaria 1985. Il genere grammaticale. In Annalisa FRANCHI DE BELLIS & SAVOIA Leonardo (eds.), *Sintassi e Morfologia della lingua Italiana d'uso: Teorie e applicazioni descrittive*. Atti del XVII Congresso Internazionale di Studi, Urbino 1983. Roma: Bulzoni. 289-310.

- RITTER Elizabeth 1995. On the syntactic category of pronouns and agreement. *Natural Language & Linguistic Theory* 13. 405-443.
- RIZZI Luigi 1986. Null objects in Italian and the Theory of pro. *Linguistic Inquiry* 17. 501-58.
- RIZZI Luigi 1997. The fine structure of the left periphery. In HAEGEMAN Liliane (ed.). *Elements of grammar*. Dordrecht: Kluwer Academic Press. 281-337.
- SPORTICHE Dominique 1989. Le Mouvement Syntaxique: Constraints et Parametres. *Langages* 95. 35-80.
- TORREGO Esther 1992. *Case and argument structure*. Boston: University of Massachusetts. Ms.
- TULLER Laurice 2000. Aspects de la morphosyntaxe du français des sourds. *Recherches linguistiques de Vincennes* 29. 143-156.
- TULLER Laurice & Celia JAKUBOWICZ 2004. Développement de la morphosyntaxe du français chez des enfants sourds moyens. *Le Langage et l'homme* 39. 191-207.
- VAN RIEMSDIJK Henk C. (ed.) 1999. *Clitics in the Languages of Europe*. Berlin: Mouton-De Gruyter.
- VOLPATO Francesca 2002. *Clitic Pronouns and Verbal Agreement in Two Deaf Adults: an Experimental Investigation*. Venice: Università Ca' Foscari Venezia. Graduation thesis.
- VOLTERRA Virginia & Elizabeth BATES 1989. Selective impairment of Italian grammatical morphology in the congenitally deaf: a case study. *Cognitive Neuropsychology* 6. 273-308.
- VOLTERRA Virginia, Olga CAPIRCI & Maria Cristina CASELLI 2001. What atypical populations can reveal about language development: the contrast between deafness and Williams syndrome. *Language and Cognitive Processes* 16. 219-239.
- WEXLER Kenneth, Anna GAVARRÒ & Vincent TORRENS 2002. Feature checking and object clitic omission in child Catalan and Spanish. In Reineke BOK-BENNEMA, Bart HOLLEBRANDSE, Brigitte KAMPERS-MANHE & Petra SLEEMAN (eds.). *Romance Languages and Linguistic Theory 2002*. Amsterdam: John Benjamins. 253-268.