The dissociation between clitics and determiners in a group of Italian SLI children

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Abstract

The present paper examines the elicited production of definite determiners, pronominal and reflexive clitics in a group of Italian children diagnosed for Selective Language Impairment. The present results argue against the Surface Hypothesis (Leonard, 1998; Leonard, 1989): Italian singular definite determiners and object pronominal clitics are phonologically identical, they are brief and non salient; nonetheless they are differently affected in the elicited production data gathered from the present experiments on a group of Italian SLI children.

Introduction

SLI is a developmental disorder that specifically affects language abilities. Children with SLI are incapable of acquiring language at the same pace or with the same success as their peers.
SLI, as the name suggests, is typically found in the absence of other symptoms that, in other pathologies, contribute to the disruption of language abilities: low IQs, neurological or auditory deficits, relational problems. A better understanding of the various linguistic profiles of children with SLI is important for practical and theoretical reasons. On the practical side, a significant percentage of children seem to be affected by this disorder: depending on the diagnostic criteria, the percentage of affected children varies between 3% and 10% of the population between 2 and 6 years of age. Furthermore, some studies have shown that people with a positive history of SLI are particularly at risk for later developing relational and psychiatric problems, and reading disorders; moreover, they are less likely to reach higher levels of education[1].
Theoretically, SLI is interesting for both cognitive science and linguistics: if SLI is genetically inherited and specific to language, we have a strong argument for a modular and innate view of language capacities. As of today, the debate on the genetic/modular component of SLI is still ongoing, and many researchers have proposed that SLI is the result of a general cognitive abilities' delay (Kail, 1994; Locke, 1994) or the consequence of the impairment of fine motor/auditory skills (Bishop, 1992; Fellbaum et al. 1995; Montgomery, 1995). Other researchers (van Der Lely, & Howard, 1993; van der Lely, 1997a, 1997b, 1997c; van der Lely et al. 2004), in contrast, have stressed that SLI can manifest itself in absence of cognitive delay or auditory loss, and others have tried to show the genetic basis of SLI, attributing the problem to a mutation in a single gene on chromosome 7 (region 7q31): this region was found to be affected by a translocation in an individual who had a severe language disorder. Lai et al. (2001) found a single point mutation on the same gene in the affected members of the KE family. Interestingly, this mutation was found in all the affected individuals but wasn't found neither in any of the unaffected family members nor in any controls from the normal population.

[1] Bishop, D. (1994). "Developmental disorders of speech and language" (p. 546-568). In Rutter et al., *Child and Adolescent Psychiatry*, Oxford-Blackwell Scientific.

Criteria for SLI and general characteristics of the impairment

The main criterion for inclusion is of course that of a significant delay/deviance of linguistic abilities: generally, SLI children should score at least 1.25 SD below the mean in the standardized tests and their Performance IQ (PIQ) should be at least 20 points higher than their Verbal IQ.

There is not a general consensus on the exclusion criteria, and this fact has turned out to be problematic: exclusion criteria are very important to distinguish SLI from other pathologies that have an effect on language abilities. In general, children that score below 85 on the PIQ or have been subject to recurrent episodes of OME, have suffered of neurological damages or present anomalies of the oral tract are not included in the category. They are also excluded if they show impaired auditory abilities, serious phonological problems or serious relational problems.

Unfortunately, these criteria fail to identify a homogeneous group with characteristics valid within and across languages. In general, we can say that SLI speakers tend to be late talkers, their production seem to be more impaired than their comprehension. Their morphological and syntactic competence is in general compromised and resembles that of younger children, while SLI tend to match their peers with respect to lexical vocabulary. In their production, omissions tend to outnumber substitutions, and functional morphemes in particular tend to be frequently omitted.

English speaking children with SLI have difficulties with inflectional morphology (Leonard et al., 1997; Ullman & Gopnik, 1994,1999) and especially with the past tense morpheme –ed, the third person singular –s, and the genitive marker –'s, while the plural marker –s doesn't seem to be very problematic. English SLI children also have problems with the nominative form of personal pronouns, which are often substituted by the default accusative form (Radford & Ramos 2001); these substitutions often appear together with agreement or tense mismatches (Clahsen, Bartke, & Gollner, 1997; Wenzlaff & Clahsen, 2004; Wexler, Schütze, & Rice, 1998). English speaking children with SLI also show a vast range of syntactic difficulties (Davies, 2002; van der Lely, 1996; van der Lely, & Stollwerck, 1997; van der Lely, 1998; van der Lely & Battell, 2003), especially with structures involving movement (A and A' and I to C movement)

Within Romance languages, French SLI children seem to have a strong tendency to omit auxiliaries and copulas (Methe & Crago, 1996; Paradis & Crago, 2001), subject and objects clitics but not determiners (Jakubowicz et al. 1998) and use non finite forms in finite contexts (OI) for longer than controls (Jakubowicz et al. 2001; Hamann et al., 2002; Hamann, 2003).

While Italian SLI children show a relatively unimpaired verbal morphology, they seem to omit object clitics and determiners to a high extent in both elicited and spontaneous production. Bottari et al. (1998) examined spontaneous production data gathered from 11 SLI children (mean age: 6;3) and found that determiner omission was significantly higher than clitic omission in this group: determiners were omitted 80% of the time, while object clitics were omitted 41% of the times. It is important to notice that the rate of clitics omission, in this experiment, is also probably overestimated: the authors counted as clitic omission any omission of an obligatory direct object complement, but, given that we are dealing with spontaneous production data, it is virtually impossible to determine if the complement missing is a clitic, a full NP or a strong pronoun.

Leonard et al (1992), on the contrary, studied the elicited production of 15 Italian SLI children (age range: 4-6) and found that they are more proficient with respect to determiners than with respect to clitics: the percentage of accuracy was 41.4% for determiners and 25% for object clitics.[2]

[2] The article didn't provide the percentage of omissions, but we can infer that it should be roughly the complement of the accuracy, given that for determiners "83% of the errors were omissions"[2] and that for clitics "almost all errors were omissions"

The Surface Hypothesis: predictions for Italian

Leonard and colleagues have proposed that the language profiles of SLI children can be accounted for by looking at the particular phonetic properties of grammatical morphemes in the various languages

Masculine		Feminine		Masculine		Feminine	
Singular	Plural	Singular	Plural	Singular	Plural	Singular	Plural
LO	LI	LA	LE	IL/LO/L[a]	I/GLI[b]	LA/L[c]	LE

(Leonard et al., 1992; Leonard et al., 1997; Leonard, 1998). They argue that the acoustic characteristics of these morphemes facilitate their omission: the less salient an element, the more likely it is to be omitted. Hence, unstressed brief elements should be particularly problematic for this population. The so called Surface Hypothesis (given its focus on the phonetic form of grammatical elements) also predicts that the difficulties encountered by SLI subjects should become milder (and possibly disappear) with time, once there has been enough exposition to the "non salient" morphemes of a particular language. Leonard and colleagues have argued that the Surface Hypothesis (SH) should also account for the characteristic of early stages of language acquisition: SLI subjects' language profiles would thus not be anomalous with respect to the ones of the normal controls, but only delayed.

The SH makes testable predictions: elements that are phonologically identical should be treated similarly by SLI children, even if their grammatical function and their syntactic behavior are different. However, Leonard emphasizes that even if a grammatical element is brief and non salient, it might not be absent from SLI production, because of some particular property of that element in a given language, which would make it salient for reasons other than acoustics. French SLI, for example, tend not to drop determiners, while they do drop object clitics, even if the two elements are phonologically identical and not salient. Leonard's account of this fact is that in French, if the article was to be dropped, gender information on the noun would be lost; the fact that the determiner alone bears gender information makes it salient and hence not subject to omission.

In Italian definite determiners and pronominal clitic are similar; in Italian, nonetheless, gender information is, in general, expressed on the noun. If this property was relevant, we would then expect Italian SLI children to differ from French SLI patients with respect to determiners' omissions.

In Table 1 we can see that determiners and clitics are phonetically similar in Italian, and hence should, according to the SH be equally problematic for SLI subjects.

Table 1.

Italian Object Clitics and Definite Determiners' System

Clitics	Determiners

[a] The masculine singular determiner "lo" appears before nouns beginning with [s] and [Σ] followed by any consonant and before [z], [ps], [pt], [ϑ] and [ks], "l" appears before nouns beginning with a vowel, while "il" appears otherwise.

[b] "gli" appears before nouns beginning with [s] and [Σ] followed by a consonant, [z], [ps], [pt], [ϑ] and [ks], "i" otherwise.

[c] When the singular masculine and feminine determiners appear before a noun beginning with a vowel, the final vowel of the determiner gets obligatorily deleted; this is only optional if a clitic is found before a verb beginning with vowel.

Moreover, object clitic pronouns and definite determiner are similar because they are phonological clitics, cannot be conjoined nor focalized and encode specificity. Definite determiners and clitics, however, have different properties: determiners have to precede their host (the noun), while object clitics always precede an indicative verb while they follow the verb in the infinitive or imperative mood; determiners cannot cluster together, clitics can. Direct object clitics and definite determiners are also different with respect to the elements they can alternate with: definite determiners only alternate with indefinite ones (Italian makes a restricted use of bare plurals), while object clitic pronouns alternate with strong pronouns and full NPs. Lastly, the two elements differ with respect to their referential properties and their semantic types.
Italian provides a nice case for testing competing accounts of SLI: the SH predicts definite determiners and object clitics to be equally impaired in SLI children because of their low acoustical saliency and phonetic similarity, while according to theories that attribute the linguistic profiles of SLI to problems related to syntactic structure and relations (Davies, 2002; van der Lely, 1998; van der Lely & Battell, 2003; Clahsen et al., 1997), there should be no reason for superficially similar elements to behave alike.

Previous findings

As mentioned before, the data in the literature with respect to the production of clitics and determiners by Italian SLI children are not very informative: spontaneous production data don't seem the best way to compare determiners and clitics, because while the first ones are almost always required, the use of the latter depends on factors such as given/new information and topic/focus distinctions.
Elicited production experiments have been conducted on French SLI children by Hamann et al. (2002) and Jakubowicz et al (1998) among others. Hamann and colleagues conducted a study on two French SLI children with opposite profiles: one child had most difficulties in the verbal domain, producing a high number of non-finite constructions (70% at age of 3;10 and 44% at age of 4.1); she was also omitting clitic pronouns to a large extent (47.1% clitic omission at age 3;10), while omitting few definite determiners (15,2% at age of 3;10 and close to 0 at 4;1). The other child, showed an impairment in the nominal domain: he was not producing many non-finite constructions (13.3% at 4;7 and close to 0 at 4;10) nor omitting clitics to a high extent (21.1% o at age of 4;7), while he was omitting the definite determiner to a high extent (41.6% at 4;7).These data suggest that definite determiners and clitics do not behave alike in French SLI children, and that clitic omissions correlate with problems within the verbal domain.
In an elicited production study on 13 French SLI children (mean age 8:11), Jakubowicz (1998) found that determiners were very well preserved (91% presence in obligatory contexts), subject clitics were present in 73% of the obligatory contexts, while the accuracy rates for reflexive clitics and pronominal clitics were 59% and 26% respectively.

The present experiment

Participants

In the present experiment participated 4 monolingual male Italian children (age range: 7-11, mean age: 9, SD: 1.4) that had previously been diagnosed for SLI by a recognized Italian institution[3]. Their IQs scores were within the limits identified for SLI (PIQ range=87-96, M=90.5, SD=3.5; VIQ range = 66-82, M=76, SD=6.3)

[3] Centro Medico di Foniatria, Padova, Italy

Materials and Procedure

A computer-based test was designed to elicit singular definite determiners (masculine and feminine) and singular direct object pronominal and reflexive clitics (masculine and feminine). Four short movies were constructed, with both animate (human and animal) and inanimate characters. At the beginning of every movie the task was described to the children: they were invited to look at a movie clip (presented for three times) and then answer to a related question. Before seeing the clip, the child was presented with the characters that were about to appear. This presentation created a context suitable for the use of a definite determiner and aimed at eliciting the same lexical item from every child. In the presentation only indefinite determiners were used to introduce the various characters. In the case in which the target response was a definite determiner, the question was: "What happened in the clip?"; half of these questions elicited a transitive verb, in order to ensure that an eventual difference between the determiners and the clitic was not due to their position in the sentence. Two examples are given in 1.

1. a) Question: Che cosa succede nella scenetta?
   What happens in the movie clip?
   Expected answer: Il topo mangia il biscotto
   The mouse eats the biscuit

   b) Question: Che cosa succede nella scentetta?
   What does the girl do?
   Expected answer: La ragazza corre
   The girl runs

In the case in which the target was a pronominal object clitic, the question was: "What did the X do to the Y"; lastly, when the target was the reflexive clitic, the question was. "What did the X do?". An example of each question is given in 2.

2. a) Question: Che cosa fa la mamma alla bambina?
   What does the mother do to the girl?
   Expected answer: (La mamma) la pettina
   (The mother) her brushes

   b) Question: Che cosa fa il gatto?
   What does the cat do?
   Expected answer: (Il gatto) si lava
   (the cat) itself washes

The first two movies elicited definite determiners while the second two elicited clitics, given that definite determiners had to be used when eliciting clitics.

The targets were the singular definite determiners "la", "lo" and "il", the object clitic pronoun "la" and "lo" and the reflexive clitic "si".10 obligatory contexts were created for each determiner and for the reflexive clitics, and 12 for each pronominal clitic. There were 28 filler questions of the type "What are the two X doing?", "What color is Y?", "How many Z are there?".

Each child was tested individually in a quiet room, while sitting in front of a computer screen. The experimenter was present during the experimental session. Every clip was about 1 minute long and at the end of every movie clip a blue screen appeared and the child was asked a question related to the clip; after the child had answered the question, the experimenter pressed a button and a new movie clip

was presented. Each movie lasted from 15 to 20 minutes (instructions included); the children watched one movie per session, and the session were scheduled 2 weeks apart from each other.

Results and Discussion

The SLI group

Table 2 contains the number of correct and incorrect responses given. Table 3 and 4 contain the breakdown of the production for pronominal clitics and definite determiners, respectively. It is clear that the SLI group is at considerably lower levels of accuracy for clitics than for determiners. In 3 a sample of non target responses is given.

Table 2.

Responses for Contexts Eliciting Clitics and Determiners (SLI Group)

Responses for Pronominal Object Clitics[a]		Responses for Reflexive Clitics[b]		Definite Determiners[c]	
Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
42/84	42/84	18/32	14/32	102/108	6/108

[a] The total contexts identified for the production of the object clitics were 96, but in two cases the subjects failed to give any kind of response, and in 10 cases the children produced a structure where the appropriate clitic was the dative one. This 10 latter case will be analyzed later.
[b] In 8 cases the children produced verbs which didn't require the presence of a clitic.
[c] The total of contexts for the production of definite determiners was 120. Overall only 108 determiners were produced, because in 12 cases the children uttered the proper name of the character (i.e. Dumbo). This was due to the fact that some of the characters in the movies were familiar to the children.

Table 3.

Breakdown of the Responses for Context Eliciting Pronominal Object Clitics

Pronominal Object Clitics			
Correct		Incorrect	
Target	Full NPs	Omissions	Gender Errors
32/84	10/84	26/84	16/84

Table 4.

Breakdown of the Responses for Context Eliciting Definite Determiners

Definite Determiners				
Correct		Incorrect		
Target	Indefinite Determiners	Omissions	Gender Errors	Other Error
89/108	13/108	2/108	2/108	2/108

3. a) Question: Cosa fa Jonny al cane?
What does Jonny do to the dog?
Expected: Lo accarezza
Him caresses
TM: Accarezza (coded "pronominal clitic omission")
Caresses

b) Question: Cosa fa la gatta?
What does the cat do?
Expected: Si gratta
Itsef scrubs
DC: Gratta (coded "reflexive clitic omission")
Scrubs

c) Question: Cosa fa Garfield alla poltrona?
What does Garfield do to the armchair?
Expected: La graffia
Her scratches
LM: Lo graffia (coded "gender error")
Him scratches

d) Question: Cosa fa la fata a Cenerentola?
What does fair do to the Cinderella?
Expected: La veste
Her dresses
AL: Veste Cenerentola (coded " non target correct")
Dresses Cinderella

A chi-square test of independence was performed to examine the relation between target and incorrect responses for definite determiners and clitics in general and between definite determiners and pronominal clitics in particular. Both were found to be significant, Ξ^2 (1, N=201) = 50.81, p <0.001; Ξ^2 (1, N=169) = 52.04, p <0.001.

Definite determiners are better preserved than clitics in SLI subjects' elicited production and in particular definite determiners were produced more accurately than pronominal object clitics. Moreover, there was no significant difference in accuracy between pronominal and reflexive clitics, Ξ^2 (1, N=106) = 1.5 p = 0.3. A chi-square test of independence (using Yates correction) was performed to examine the relation between omissions and (correct and incorrect) production for clitics and determiners. Omissions are significantly more common when the target is a pronominal clitic, Ξ^2 (1, N=169) =30.48, p <0.001.

One interesting piece of data emerges from the error analysis: in 16 cases the target feminine clitic was substituted by the masculine clitic; the opposite error was never found. This substitution was particularly frequent in two of the four SLI children (a fact of possible interest is that these two participants were siblings): 12 of the 16 errors were found in their production (7 for TM and 5 for LM). This kind of error is not found in the case of definite determiners: only in two instances (one found in LM, one in AL) over 108 cases a gender agreement error ("il" instead of "la") was produced.

This piece of data is consistent with previous findings from French acquisition: Chillier et al. (2001) found a 13% gender agreement errors in a group of normally developing of 4 year olds.

It is worth noticing that this pattern was more common for the pronouns that referred to inanimate objects and animals (13 over 16 errors). Some possibilities come to mind: it is conceivable that the children did not remember the noun used in the movie clip to introduce the relevant character, had in mind a different masculine definite description for it or had troubles in recovering the gender of a referent not immediately recoverable from the previous context. An alternative explanation that capitalizes on SLI difficulties with gender agreement or on the possibility for NPs to be unspecified for gender in these grammars would fail to explain why the error rate was so low in the case of determiners. This issue cannot be explored here given the small amount of data and the fact that the present experiments were constructed to study a different phenomenon, but it should be noted that gender errors appear very pervasive in the spontaneous production of this group of children:

4. Perché aveva il pollice allungata
   Because had the thumb-MASC lengthened –FEM

5. La savana africana, che è molto, molto caldo
   The savanna-FEM african-FEM which is very very hot-MASC

6. E' il vulcano più attiva
   Is the volcano-MASC most active-FEM

7. L'impero romano era stata conquistato
   The empire roman had been-FEM conquered-MASC

8. Ha trovato una lampada magica e lo strofina
   Has found a-FEM lamp-FEM magic-FEM and it-MASC rubs

Summing up: the SLI patients here examined show a clear dissociation between definite determiners and pronominal object clitics. In the case of pronominal clitics, errors (omissions and substitutions) outnumber the production of the target pronominal element. Moreover, clitics seem to be problematic in general for these children: the number of incorrect responses produced in the case of a target reflexive clitic is comparable to the one obtained for pronominal clitics, with the important difference that in the case of reflexive clitics there were no substitution errors.

The controls

It is customary, when working with SLI children, to compare their performance with three control groups matched for age, vocabulary and syntactic abilities[4].
Three groups of controls were recruited: the first group was matched for age (mean age=9;5, SD=0;6), the second group was matched for vocabulary competence (Boston naming test, Weintraub, 1983) and its mean age was 6;3 (SD=0,6). The third group was matched for syntactic abilities (T.R.O.G., Bishop, 1982); the mean age for this group was 4;6 (SD=0;4)
In table 5, 6 and 7 we can see the results obtained from the age and vocabulary-matched controls[5] and in table 8, 9 and 10 the results from the syntactic controls are displayed.

Table 5.

Responses for Contexts Eliciting Clitics and Determiners (Age and Vocabulary-matched Controls)

Pronominal Object Clitics		Reflexive Clitics[a]		Definite Determiners	
Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
191/192	1/192	74/75	1/75	238/240	2/240

[a] The total relevant contexts are 75 instead of the expected 80, because in 5 cases the children produced a verb which didn't require the presence of a clitic.

Table 6.

Breakdown of Responses for Contexts Eliciting Pronominal Object Clitics (Age and Vocabulary matched Controls)

Pronominal Object Clitics			
Correct		Incorrect	
Target	Full NPs	Omissions	Gender Errors
167/192	24/192	1/192	0/192

[4] As mentioned above, SLI children's lexical competence is in general better preserved than their syntactic one.
[5] The results from these two groups were collapsed together because both groups were at ceiling and no singnificant difference was found for mastery of clitics and determiners.

Table 7.

Breakdown of Responses for Contexts Eliciting Determiners (Age and Vocabulary matched Controls)

Definite Determiners				
Correct		Incorrect		
Target	Indefinite Determiners	Omissions	Gender Errors	Other Error
216/240	22/240	0/240	0/240	2/240

A chi-square test of independence (using Yates correction) was performed to examine the relation between definite determiners and clitics in general with respect to accuracy rates. This relation was not significant, Ξ^2 (1, N=461) = 0.1551, p = 0.6937. The relation between object clitics and definite determiners with respect to accuracy was also not significant, Ξ^2 (1, N=386) = 0.0516, p = 0.8203
A chi-square test of independence (using Yates correction) was also performed to compare SLI and age and vocabulary-matched controls with respect to accuracy for definite determiners and clitics. Comparing the SLI group and the age/vocabulary controls with respect to target and incorrect responses to contexts eliciting definite determiners we find that the controls are more accurate than SLI, Ξ^2 (1, N=348) = 5.44, p = 0.0167. Furthermore, age and vocabulary matched controls and SLI do differ with respect to their accuracy in producing clitics in general, Ξ^2 (1, N=349) = 140.33, p <0.001 and object clitics in particular Ξ^2 (1, N=242) = 107.08, p <0.001. Age and vocabulary matched controls are significantly more accurate than the SLI participants in all tasks.

Table 8.

Responses for Contexts Eliciting Clitics and Determiners (Syntactic Control Group)

Pronominal Object Clitics[a]		Reflexive Clitics[b]		Definite Determiners	
Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
89/111	22/111	47/47	0/47	146/150	4[c]

[a] The total context requiring a pronominal object clitic were 120. In 9 cases the children failed to give any response, or their response was either unintelligible or unrelated to the task.
[b] The total relevant cases were only 47 because in 3 cases the children failed to produce a verb requiring a reflexive clitic.
[c] These were all cases of substitution of "il" over "lo".

Table 9.

Breakdown of the Responses for Contexts Eliciting Pronominal Object Clitics (Syntactic Control Group)

Pronominal Object Clitics			
Correct		Incorrect	
Target	Full NPs	Omissions	Gender Errors
65/111	24/111	21/111	1/111

Table 10.

Breakdown of the Responses for Contexts Eliciting Determiners (Syntactic Control Group)

Definite Determiners				
Correct		Incorrect		
Target	Indefinite Determiner	Omissions	Gender Errors	Other
138/150	8/150	0/150	0/150	4/150

A chi-square test of independence (using Yates correction) was performed to examine the relation between definite determiners and clitics in general with respect to accuracy in the group of syntactic controls. This relation was significant, Ξ^2 (1, N=276) = 13.39, $p < 0.005$; determiners were produced significantly more accurately than clitics by this group of children. Comparing this group's accuracies with respect to definite determiners and pronominal clitics, a significant difference was also found, Ξ^2 (1, N=229) = 24.8778, $p < 0.001$. Definite determiners were produced significantly more accurately than pronominal clitics by this group.

The syntactic controls omit the pronominal clitic 25% of the times, and only produce 1 substitution; interestingly, they are at ceiling for both reflexive clitics and definite determiners. This piece of data is consistent with the findings for the slightly older (age range 5;6-5,11) French controls from Jakubowicz's experiment: they almost never omit the reflexive or the determiner, while omitting the pronominal clitic around 30% of the times. On the contrary, this piece of data is not completely consistent with other findings for Italian, according to which 4 year olds should be at ceiling in their production of all clitics: according to Schaeffer (2000, 2007), Italian children omit pronominal clitics up to 65% at around 2;6, up to 15% at around 3, while they are at ceiling at 4 years of age (0-1% of omissions). Similar percentages were found by Tedeschi (2006), who examined the elicited production of 6 Italian subjects (men age 3;5), finding a 6% omissions and by Guasti (2002), who examined data from 3 children learning Italian finding they produce less than 9% of omissions before their 3rd year of age.

Comparing the SLI group and the syntactic control group with respect to accuracy for definite determiners, no significant difference emerges: Ξ^2 (1, N=237) = 0.967, p = 0.32. The SLI group and the syntactic control group are similar in their mastery of the definite determiner system.
When we compare the SLI and the syntactic control group with respect to accuracy for clitics in general, a significant difference emerges: the syntactic control group is more accurate than the SLI group, Ξ^2 (1, N=240) =35.76, p < 0.001. This difference could be due to the fact that the syntactic controls are 100% accurate in their production of reflexive clitics, while the experimental group is at chance. Comparing the SLI and the syntactic controls with respect to their accuracy for pronominal clitics, we find a significant difference, Ξ^2 (1, N=161) =16.53, p < 0.005; syntactic controls are significantly more accurate then the SLI group even with respect to pronominal clitics. It is interesting to notice that the two groups do not differ significantly with respect to omission rate, Ξ^2 (1, N=161) =2.34, p = 0.17, while they differ significantly with respect to substitutions Ξ^2 (1, N=161) =15.64, p < 0.005.
The data gathered in this elicited production experiment show that definite determiners and pronominal clitics are not equally preserved in the production of Italian SLI children; interestingly, definite determiners are produced more accurately than pronominal clitics even by the group of younger controls. There are two main differences between the SLI group and the syntactic controls that should be investigated further: SLI children don't seem accurate in producing clitics in general, and have a high rate of omissions also for reflexive clitics, while syntactic controls are at ceiling with respect to the production of reflexive clitics. Secondly, the SLI and the syntactic controls differ with respect to the type of errors they produce when the target is the pronominal clitic: SLI children have a high rate of both omissions and substitutions, while for the controls omissions are virtually the only error produced.

Discussion

It is important to note that the present results replicate the general findings obtained by Jakubowicz (1998) for French SLI children: in both populations a sharp distinction between object clitics and definite determiners was found, hence providing growing evidence against the SH. There are, nonetheless, some important differences between the present findings and Jakubowicz's: in the latter experiment a significant difference between pronominal object clitics and reflexive clitics was found; this trend is not observed in the SLI children in the present experiment, while it is found in the syntactic control group. This finding is quite puzzling: one possibility to account for it would be to attribute the difference to some particular unique property of the reflexive clitic in Italian (which somehow makes it more difficult to master) or to some property of the reflexive clitic in French (which makes it easier to master). But this line of reasoning doesn't seem the most fruitful one, given the data from the syntactic controls, which replicate the French pattern.
Another possibility is to look for possible differences in design, material or codification between the two experiments. One difference is that while Jakubowicz only elicited proper reflexives, in the present experiment 4 inherent reflexives (*dondolarsi* "to swing", *arrampicarsi* "to climb", *stiracchiarsi* "to stretch", *profumarsi* "to perfume") were presented along with proper reflexives (*lavarsi* "to wash oneself", *pettinarsi* "to comb oneself", *guardarsi* "to watch at oneself"...). Two of the inherent reflexive verbs were excluded from the analysis because *dondolarsi* also has a (less common) unergative variant (*dondolare*) and hence the absence of a reflexive clitic could not be unambiguously analyzed as an omission; *stiracchiarsi* was removed from the analysis because it gave rise to many non target responses. The remaining two inherent reflexives verbs gave rise to 5/8 omissions. This could indeed be one of the reasons the present data differs from the data presented by Jakubowicz and

colleagues: if we were now to compare accuracies for reflexives and pronominal clitics after removing the inherent reflexives verbs, we would see a marginal tendency towards a better preservation of reflexive clitics, Ξ^2 (1, N=101) = 4.34, p = 0.037. This possibility of there being a difference between inherent and proper reflexive clitics and was not found in any of the control groups, which are at ceiling. We have seen that one source of the differences between the present and the French study relies partially in the linguistics materials. Once the differing materials are remoned from the analysis, the data start looking more similar. A closer look at the way errors were coded in the present and in Jakubowicz et al.'s experiment offer additional insights to understand the differences between the two studies. Very importantly, Jakubowicz codes all non target responses as errors. Hence, she counts all full NPs responses to questions eliciting a clitic as errors, while in the present experiment they were coded as "non target correct".

9. Que fait Kiki à Nounours? I brosse Kiki (coded as "DP free expression error")
What does Kiki do to Nounours? He is brushing Kiki

These responses amounted to 32.7% of the total responses given by the SLI group to context eliciting pronominal object clitics in her experiment, while they amounted to 13% of the total responses given by the controls. In the present experiments they amounted to 12% of the responses given by the SLI group, to 12.5% of the responses given by the Age and Vocabulary matched controls and to 21.6% of the responses given by the syntactic controls. Deciding how to treat full NP responses is not trivial, but it is clear that they represent a high proportion of the total responses and a difference in coding them can make two results look very different. The rationale behind treating them as errors is transparent: such responses look pragmatically awkward and one could entertain the possibility that participants resort to this kind of pragmatic violation when they haven't completely mastered the clitic system[6]. More importantly, if one considers these to be errors, then it follows that one can safely consider omissions in these contexts as genuine clitic omissions. On the other side, if one considers these to be non-target correct responses, then it is harder to maintain that omissions are indeed clitic omission, given that they could be omissions of a non target full NP. On the other hand, it seems too strong to treat these responses as errors, given that the given contexts facilitate but do not force the usage of a clitic pronoun: even adults and older controls choose to use a full NP in a significant amount of cases. Moreover, considering these responses as errors creates an unfair comparison with reflexive clitics, where a full NP cannot be used for grammatical reasons (it would give rise to a Principle C violation): notice that, if one was to remove these responses from Jakubowicz results, there would be no significant difference in accuracy for reflexives and pronominal clitics. Lastly, some additional non-target responses that in my own experiment were coded as "other" and removed from the analysis, were coded as "object clitic omission" in the French experiment.

10. Que fait Kiki à Nounours? i [_] passe le mouchoir (coded as "object clitic omission")
What does Kiki do to Nounours ? He passes the handkerchief

In these cases the children are producing a subject clitic and a object NP, while omitting an oblique clitic argument: this omission was coded by Jakubowicz as an object clitic omission, while in the present experiment the same kind of response was coded as "other" because it is an omission of an element that the experiment was not designed to elicit, a dative clitic omission: Here is a parallel example from the present experiment:

[6] In a way that reminds OT, so that violating a pragmatic constraint is better than the possibility of committing a syntactic violation. It would be interesting to see if this happens also with second language learners.

11. Cosa fa il cane al gatto? [_] toglie le pulci (coded as "other")
What does the dog do to the cat? takes away fleas

10 constructions over 94 were similar to the constructions seen in 11 and elicited a response where the appropriate clitic would have been a dative clitic (either the masculine "gli" or the feminine "le"). In 9 cases over 10 the relevant clitic was missing.
With these differences in mind, we can reanalyze the accuracy rates for clitics and pronominal clitics as Jakubowicz and colleagues did: reflexive now look significantly better preserved than pronominal clitics $\Xi^2(1, N=121) = 9.2, p < 0.005$.
A potentially interesting fact emerged from the previous discussion: dative pronominal clitics seem to be very easily omitted; interestingly, a similar datum emerges from an analysis of the reflexive clitics. Let's consider the following responses from the French and the Italian experiments:

12. Que fait Kiki ? e [_] lave un main
What does Kiki do? she washes a hand

13. Cosa fa Cenerentola? [_] pettina i capelli
What does Cinderella do? brushes the hair

In this cases the expected answer was a simple reflexive construction (*elle se lave*/*si lava* "she washes herself"), while what we get is a transitive construction with an omitted benefactive reflexive. These responses were counted as reflexive omissions in the present experiment, while they were counted as non target (incorrect) full NP responses in the French experiment. In the Italian experiment these constructions were attempted by the SLI participants in 12 cases over 32 and in 9 cases over 12, the clitic was missing. In the French experiment, these constructions were produced 16% of the times by one subject and 4% by the other subjects. Reanalyzing the Italian data with the criterion used for French, and hence counting the NP responses as errors, addind the dative clitics responses and removing the constructions eliciting an inherent reflexive verb, the findings of the two experiments look very similar:

Table 8.

Total Responses for Contexts Eliciting Clitics: Revised (SLI Group)

	Pronominal Clitics		Total Pronominal Clitics	Reflexive Clitics		Total Reflexive Clitics
	Accusative	*Dative*	(*Accusative + Dative*)	*Accusative*	*Dative*	(*Accusative + Dative*)
CORRECT	32/84	0/10	32/94	15/15	3/12	18/27
INCORRECT:						
Full NP	10/84	0/10	10/94	--	--	--
Omissions	26/84	9/10	35/94	0/15	9/12	9/27
Gender Errors	16/84	1/10	17/94	--	--	--

Two potentially interesting facts emerge from looking at the data in this novel way: Italian SLI children never omit the (proper) accusative reflexive clitic, resembling in this way the controls. Moreover, indirect object clitics in general are very problematic for SLI Italian children
Unfortunately, the present data was not intended to explore this difference, and we can only sketch a picture of the phenomenon: comparing the omission rates for direct and indirect object clitics, we see that direct object clitics are significantly less likely to be dropped, $\Xi^2 (1, N=116) = 22.2, p < 0.001$.

Table 9.

Breakdown of Clitic Omissions for the SLI Group

	Accusative Clitic Omissions	Dative Clitic Omissions
Pronominal	26/94	9/10
Proper Reflexive	0/20	9/12
Total	**26/94**	**18/22**

Concluding Remarks

From the present elicited production experiments we have seen that determiners and object pronominal clitics are differently impaired in Italian developmental language pathology: this dissociation is in line with various findings coming from other studies of French SLI children (Hamann et al., 2002; Hamann, 2003; Jakubowicz et al., 1998; Jakubowicz, Tuller & Rigaut, 2000; Paradis, Crago & Genesee, 2003) while it disconfirms the predictions of the Surface Hypothesis (Leonard, 1989; Leonard, 1998).
The present data from a group of Italian SLI children and a group of younger normally development controls with similar syntactic competence show that while both groups are at ceiling for the production of the definite determiners, pronominal object clitics are subject to omissions and substitutions. The findings for reflexive clitics are not straightforward: many of the structures designed to elicit direct object reflexive clitics gave rise to structures requiring an indirect object reflexive clitic, and hence the comparison between direct object reflexives and pronouns didn't yield clear-cut results. Nonetheless, a trend seems to be identifiable from the present data: direct object reflexives are somewhat easier than direct object pronominal clitics, which in turn are easier that indirect object clitics (both reflexive and pronominal ones). This fact, if confirmed, would require a structural explanation that takes into account the different positions occupied by these elements and the syntactic properties of the direct object reflexive clitic, the pronominal clitic and the indirect object clitic in the tree structure.
van der Lely and colleagues (van der Lely,1996; van der Lely & Stollwerck, 1997; van der Lely & Battell, 2003), among others, have proposed that the deficit observed in SLI is syntactic in nature; more specifically that this deficit affects some very general syntactic property: movement. If this proposal is on the right track, and if we also assume a movement analysis for clitics (Kayne, 1991) but not for

determiners, we could argue that clitics are problematic in SLI because they require movement and, as van der Lely proposes, movement operations are affected in SLI.
Even though appealing, a proposal along these lines would encounter some serious problems: SLI children do produce the pronominal direct object clitic in its target preverbal position half of the times. More importantly, if movement operations were to be problematic and if a movement analysis for clitics is assumed, we would expect to find a clitic in its base post-verbal position, at least in some instances. This kind of error is never found: the clitic either is in its correct preverbal position or omitted. Lastly, such an analysis would need to be implemented if the non homogeneous behavior of different types of clitic pronouns was to be confirmed.
A hypothesis worth mentioning to explain the different behavior of determiners and clitics in general relies on optionality of movement in SLI grammars (Davies, 2002) and on the idea that clitics involve both base generation and movement (Sportiche, 2006). According to Sportiche (2006) pronominal clitics are base generated in a preverbal position, as heads of their own projection (CliticVoiceP). The clitic is linked to a *pro*, which is the argument of the transitive verb. *Pro* has to move to CliticVoiceP in order to be in a spec-head relation with the clitic (because of the Clitic Criterion, or an EPP feature). If movement is seen as being optional, *pro* does not always get to the specifier of CliticVoiceP, but this results in a violation of the *clitic criterion* and the whole CliticVoiceP gets then eliminated. A similar analysis could be extended to the grammars of the syntactic controls, given that a similar omission patter is found in their production. An analysis based on the optionality of movement of a null element, nonetheless, seems problematic to account for the developing grammars of the normal population; it is not clear what clues would be able to trigger the grammar to review its initial hypothesis and to turn into the adultlike grammar where movement is obligatory.

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