

# On the acquisition of clitic placement in restructuring: A study on monolingual Italian children

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## Abstract

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This study investigates the production of clitic pronouns by monolingual Italian children aged 4;9-10;11, using a sentence repetition task including sentences with one or two restructuring verbs. The main findings are as follows: (i) children were more

accurate with proclitics than enclitics, (ii) in their reproductions, they sometimes changed the clitic position and most often resorted to clitic climbing, to either the highest verb (in 2-verb sentences) or the intermediate verb (in 3-verb sentences), (iii) some instances of clitic reduplication were found, with similar tendencies as placement changes, (iv) no difference was observed between modal and motion verbs. These results show that restructuring is fully available to children and they prefer to produce monoclausal structures (Rizzi 1976, 1978/82; Cinque 2004) despite the long dependency established by clitic climbing. This in turn means that children's grammar is guided by Structural Economy, like adults' grammar. Children however assumed that restructuring verbs may be lexical less often than adults. Children never produced clitic misplacement errors, replicating previous findings on monolingual acquisition.

**Keywords:** restructuring, clitic climbing, acquisition, Italian, structural economy.

## 1. Introduction

This study investigates the production of clitic pronouns with restructuring verbs by monolingual Italian children. Restructuring has attracted much interest in the theoretical literature since the seminal work by Rizzi (1976, 1978/82) because of the optional clitic placement observed with some verbs and in some languages. In Italian example (1), the clitic *lo* 'it' appears on either the infinitival lexical verb *fare* 'do' by which it is selected (1a) or the superordinate finite modal verb *volere* 'want' or motion verb *andare* 'go' (1b).

- |     |    |                   |                |   |                       |                  |
|-----|----|-------------------|----------------|---|-----------------------|------------------|
| (1) | a. | Vogli-o           | far= <b>lo</b> | / | Vad-o                 | a far= <b>lo</b> |
|     |    | want-PRS.1SG      | do.INF=it      | / | go-PRS.1SG            | to do.INF=it     |
|     | b. | <b>Lo</b> vogli-o | fare           | / | <b>Lo</b> vad-o       | a fare           |
|     |    | it want-PRS.1SG   | do.INF         | / | it go-PRS.1SG         | to do.INF        |
|     |    | 'I want to do it' |                | / | 'I am going to do it' |                  |

Previous literature pointed out that children have access to restructuring and clitic climbing, as in (1b), from the very early stages of language acquisition (cf. e.g. Schaeffer 2000 for Italian; Rodríguez-Mondoñedo, Snyder and Sugisaki 2005 for Spanish; Lobo and Vitorino 2021 for European Portuguese). The availability of the two options in (1) is a parametric property that is set very early, like other parameters. However, a number of other properties of restructuring have been overlooked in studies about the L1 acquisition of Italian. It remains to be established how restructuring develops over time and whether child grammar has the same properties as adult grammar.

We analyzed the phenomena in 4;9 to 10;11-year-old children. In the years between the end of pre-school and the beginning of primary school, the clitic omission stage is over, and children start producing good percentages of object clitics (Varlokosta et al. 2016), which made it possible to expect a good amount of data on clitic placement in restructuring. Since different types of clitic pronouns are mastered at different stages of the acquisition process (e.g., Tuller et al. 2011; Cardinaletti, Cerutti and Volpato 2021), we tested pronouns of different persons (1<sup>st</sup>/2<sup>nd</sup> vs. 3<sup>rd</sup>) and cases (accusative vs. dative).

As shown in (1), clitic placement in restructuring is optional in Italian, and it is so in other Romance languages. Acquisition studies, however, pointed out a difference between the two options in (1). On the one hand, studies on the L1 acquisition of Spanish (Eisenclas 2003) and European Portuguese (Lobo and Vitorino 2021) found a preference for proclisis over enclisis. On the other hand, in Italian L2 grammars, a tendency toward enclisis was observed (e.g. Bennati and Matteini 2006). The answer to the question whether Italian children also show a preference for proclisis over enclisis will provide insights into the way monolingual and bilingual/L2 acquisition proceed.

Moreover, some differences among restructuring verbs were reported in the literature. In both native and non-native adult speakers of Italian, clitic climbing was produced more often with modal than motion verbs (Bennati and Matteini 2006, Bennati 2007). We aim at verifying whether the modal vs. motion verb asymmetry found in adults and L2 acquisition is also observed in L1 acquisition. This allows us to evaluate whether children's grammar is sensitive to the different subclasses of restructuring verbs.

All previous studies analyzed sentences containing one restructuring verb. More complex structures containing two restructuring verbs are explored in this study in order to obtain a more complete picture of the acquisition of restructuring.

The paper is organized as follows. In section 2, the analysis of restructuring and clitic climbing is presented. Previous studies on the acquisition of clitic pronouns and restructuring are discussed in section 3. Section 4 presents our study: participants, materials, procedure, and results, whose discussion is undertaken in section 5. Section 6 concludes the paper by summarizing the main findings.

## 2. The analysis of restructuring and clitic climbing

As (1) above shows, some verbs allow for clitic pronouns to appear in more than one position. Other verbs do not allow the same optionality. The infinitival complement in (2) behaves like the finite complement in (3) blocking the movement of the clitic to the higher position.

- (2) a. Ador-o /                      Detest-o                      far=**lo**  
       love-PRS.1SG /                detest-PRS.1SG do.INF=**it**  
   b. \***Lo** ador-o /                detest-o                      fare  
       it love-PRS.1SG / detest-PRS.1SG do.INF  
       'I love/detest to do it'
- (3) a. Vuol-e                      che Maria **lo** faccia  
       want-PRS.3SG                that Maria it do.SUBJV.SG  
   b. \***Lo** vuol-e                che Maria faccia  
       it want-PRS.3SG that Maria do.SUBJV.SG  
       'He wants that Maria does it'

Clitic climbing as in (1b) is possible with so-called "restructuring" verbs, which include modal, aspectual, and motion verbs. The name comes from the syntactic operation "which optionally reanalyzes a terminal substring  $V_x(P)V$  as a single verb

complex, hence automatically transforming the underlying bisentential structure into a simple sentence” (Rizzi 1978/82: 5). Cinque (2004) does not assume any restructuring rule but takes restructuring verbs to be functional verbs merged in the functional spine that is associated with lexical verbs, as shown in (4). Cardinaletti and Shlonsky (2004) adopt an intermediate view. Modal, aspectual, and motion verbs may be merged as either functional verbs, as in (4), or lexical verbs selecting a full clause (or a smaller structure such as TP, cf. Amato 2021), as shown in (5).

(4) [CP ... [FP ... [FP V<sub>restr</sub> [FP ... [VP V ]]]]]

(5) [CP ... [FP ... [VP V [CP ... [VP V ]]]]]

Adopting the structure in (4), proclitic pronouns as in (1b) move sentence-internally onto the finite verb (6a), as happens in simple clauses (6b).

- (6) a. [CP **lo** vogli-o fare <lo>]  
       it want-PRS.1SG do.INF it  
       ‘I want to do it’  
   b. [CP **lo** facci-o <lo>]  
       it do-PRS.1SG it  
       ‘I do it’

Enclisis as in (1a) may either arise in the biclausal structure in (5), which forbids climbing as in (2) and (3), cf. (7a), or in a monoclausal structure where climbing has not occurred, cf. (7b). In this analysis, climbing itself is taken to be optional.<sup>1</sup>

- (7) a. [CP vogli-o [CP far=**lo** <lo>]]  
   b. [CP vogli-o far=**lo** <lo>]  
       want-PRS.1SG do.INF=it it  
       ‘I want to do it’

Previous literature provides evidence for both (7a) and (7b). The analysis in (7a) accounts for the fact that the sequence embedded under the modal verb may display an independent tense (*vorrei averlo detto* ‘I would like to have said it’) and contain clausal negation (*vorrei non dirlo a nessuno* ‘I would like not to say it to anybody’). In these cases, clitic climbing is impossible: *\*lo vorrei aver detto*, *\*lo vorrei non dire a nessuno* (cf. Rizzi 1976: 12-13; Kayne 1989: 243, 253). The analysis in (7b) is based on the observation, due to Rizzi (1976: 48, note 18), (1978/82: 44, note 26), that enclisis is compatible with another restructuring phenomenon, namely so-

<sup>1</sup> As shown by their position with respect to the adverb *bene* ‘well’ in (i), the clitic pronoun and the infinitival verb do not occur in their first-merge positions but have raised higher.

- (i) Vogli-o far=**lo** bene <fare> <lo>  
       want-PRS.1SG do.INF=it well do.INF it  
       ‘I want to do it well’

For convenience, in (7) and throughout, only the trace of the clitic pronoun is provided.



(1994) antisymmetric approach, enclisis in (7b)/(8b) arises via left-adjunction of the infinitival verb to the clitic raised to the low clitic position in (9). We suggest that in monoclausal structures, clitic climbing is favored over enclisis because in the former case, only one element moves, while in the latter, both the pronoun and the verb undergo movement (see fn. 1). In the perspective of Jakubowicz' (2005, 2011) and Jakubowicz and Strik's (2008: 106) Derivational Complexity Metric,<sup>3</sup> the quantity of constituents that move (i.e., undergo Internal Merge) seems to cause more computational complexity than the quantity of steps involved in the movement of a single constituent. The preference for clitic climbing can thus be seen as the interplay of two very general principles that rule linguistic computations: Structural Economy and Derivational Economy. Enclisis is however the only possibility in biclausal structures, cf. (7a). In the lack of independent evidence that enclisis occurs in monoclausal structures (auxiliary *essere* with unaccusative verbs, cf. (8b)), we suggest that the presence of an enclitic is interpreted as evidence for a biclausal structure.

We do not further discuss the syntax of clitic placement in restructuring contexts. We only note that similar observations hold for sentences containing two restructuring verbs. Proclisis on the highest verb implies a monoclausal structure (11). Enclisis on the intermediate verb is compatible with the two analyses in (12) (when used as restructuring, motion verbs make one more clitic position available, cf. Cardinaletti and Shlonsky 2004. Note that in (12), the pronoun undergoing clitic climbing is enclitic because the restructuring verb itself is infinitive). Enclisis on the lexical verb is compatible with more structural analyses (13).

- (11) [CP **lo** vuol-e            andare    a comprare <lo>]  
       it want-PRS.3SG    go.INF    to buy.INF    it  
       ‘He wants to go to buy it’
- (12) a. [CP vuol-e            [CP andar=**lo**    a comprare <lo>]]  
       b. [CP vuol-e            andar=**lo**    a comprare <lo>]  
           want-PRS.3SG    go.INF=it    to buy.INF    it  
           ‘He wants to go to buy it’
- (13) a. [CP vuol-e    [CP andare    [CP a comprar=**lo** <lo>]]]  
       b. [CP vuol-e            andare            [CP a comprar=**lo** <lo>]]  
       c. [CP vuol-e    [CP andare            a comprar=**lo** <lo>]]  
       d. [CP vuol-e            andare            a comprar=**lo** <lo>]  
           want-PRS.3SG go.INF            to buy.INF=it    it  
           ‘He wants to go to buy it’

Structural Economy favors the smallest structure, i.e., (12b) over (12a) and (13d) over (13a,b,c). Derivational Complexity disfavors (12b) and (13c,d).

In conclusion, proclisis is associated with a smaller structure but a longer dependency than enclisis. Enclisis implies a shorter dependency than proclisis but the

<sup>3</sup> Jakubowicz (2011: 340) formulates the Metric as follows:

Derivational Complexity Metric (Jakubowicz 2005):

- a. Merging  $\alpha_i$   $n$  times gives rise to a less complex derivation than merging  $\alpha_i$  ( $n + 1$ ) times.  
 b. Internal Merge of  $\alpha$  gives rise to a less complex derivation than Internal Merge of  $\alpha + \beta$ .

movement of two lexical items, i.e., the clitic pronoun and the infinitival verb. Proclisis only arises in monoclausal structures, enclisis arises in either monoclausal or biclausal structures.

### 3. Previous studies of the acquisition of restructuring

While much research was devoted to the acquisition of clitic pronouns, a systematic study of the acquisition of clitics in restructuring contexts is missing for Italian. Only sporadic observations are available. Clitic placement in restructuring was mainly studied in bilingual/L2 grammars. As for the other Romance languages, the literature about the acquisition of restructuring is also scarce. In the following sections, we present the background to our study.

#### 3.1. Age and type of pronouns

The acquisition of clitic pronouns in Romance languages is a relatively long process. Between the end of pre-school and the beginning of primary school, the clitic omission stage is over, and children start producing good percentages of object clitics in simple sentences (Varlokosta et al. 2016). Full mastery of clitic pronouns is however attained during primary school (cf. Delage, Durrlemann and Frauenfelder 2016 for French). As for restructuring, Schaeffer (2000) showed that clitic productions in Modal+infinitive constructions by Italian children aged 2;1-5;11 develops in a parallel way as in present tense and Aux+participle contexts. No data are available about the production of clitics in restructuring contexts at school age.

Many studies on the acquisition of Romance languages observed a difference in clitic production depending on the Person and Case features of the pronoun: 3<sup>rd</sup> person accusative clitics are fully mastered later than the other clitics. For 1<sup>st</sup>/2<sup>nd</sup> vs. 3<sup>rd</sup> person pronouns in French, see Tuller et al. (2011) among others. No data on the variable “Person” are available for Italian. For dative vs. accusative 3<sup>rd</sup> person pronouns in Italian, see Cardinaletti, Cerutti and Volpato (2021), who showed that at the end of primary school, some residual difficulties in producing 3<sup>rd</sup> person accusative clitics persist. They attributed this difficulty to the need to retrieve a clitic pronoun agreeing in gender (and number) with its antecedent. Eisenclas (2003) did not find any difference between dative and accusative pronouns in her elicited imitation task of sentences containing restructuring verbs in Spanish.

For Italian, we do not know whether the same differences among different types of pronouns emerge in restructuring contexts as in simple contexts.

#### 3.2. On the preference for enclisis or proclisis

Although clitic climbing is optional in Italian and the other Romance languages that allow it, preferences for either one or the other clitic position were reported in previous literature.

Some sporadic observations report that in the spontaneous production of L1 Italian, enclitic pronouns emerge first (Antelmi 1997). The reverse is however also observed: The climbing option come in first in spontaneous productions (Guasti 1993/94). As for elicited production, Schaeffer (2000) provided no data as to whether

one of the two positions was preferred by Italian children in Modal+infinitive structures, but Bernardini and van der Weijer (2018) reported a preference for proclisis over enclisis for a very small group of Italian children (4 children aged 4-7, mean age 5;5).

The same preference for clitic climbing over enclisis emerged in studies on the L1 acquisition of Spanish (where the elicited imitation of sentences containing one restructuring verb was investigated in children aged 3;0-6;4; Eisenclas 2003) and European Portuguese (where spontaneous and elicited production were investigated in children aged 1;5-3;11 and 5;2-8;2, respectively; Lobo and Vitorino 2021). The analysis of spontaneous productions by five Spanish children from the CHILDES corpus (age range 1;4-4;8) pointed out that both proclitics and enclitics were produced very early; interestingly, one of the children only produced sentences with clitic climbing (Rodríguez-Mondoñedo, Snyder and Sugisaki 2005).

In the account of restructuring adopted in section 2, clitic climbing occurs in monoclausal structures. A preference for proclisis means that children prefer the monoclausal analysis of sentences containing restructuring verbs, which we interpret to derive from Structural Economy, in combination with Derivational Economy, as in adults' grammar.

Different results were found in studies on the L2 acquisition of Italian. In written elicitation tasks, adult L2 advanced learners of Italian avoided clitic climbing: With modal verbs, proclitics were only produced 40% of the time by L1 English/German advanced learners and 24% of the time by L1 Spanish learners, while Italian native speakers produced 95% of proclitics (Bennati and Matteini 2006). The percentage of clitic climbing increased to 75% in adult L1 English and Spanish near-native speakers of Italian (Bennati 2007). Clitic climbing thus appears to be a function of language competence. It takes time to produce clitic climbing, even by Spanish speakers who have this option in their L1. Similar results were found in the L2/bilingual acquisition of clitic climbing in Spanish (Pérez-Leroux, Cuza and Thomas 2011; Duffield and White 1999). Children showed an enclisis bias, differently from the monolingual children studied by Eisenclas (2003). A preference for enclisis can be interpreted as a preference for short dependencies in spite of the more complex, biclausal structure it implies. As we have seen in section 2, enclisis tends to be associated to embedded clauses out of which clitic climbing cannot take place.

A systematic study of the L1 acquisition of restructuring in Italian is needed to establish whether clitic climbing is preferred over enclisis as in the L1 acquisition of other Romance languages, differing from L2 acquisition.

### 3.3. On the asymmetry among restructuring verbs

A difference between modal and motion verbs was observed in the two written elicitation studies mentioned above (Bennati and Matteini 2006, Bennati 2007). In both native and non-native adult speakers of Italian, more proclitics were produced with modal than motion verbs: natives 95% vs. 80%; L1 English near-native speakers of Italian 75% vs. 40%; L1 Spanish near-native speakers of Italian 75% vs. 38%; L1 English/German advanced learners of Italian 40% vs. 24%. Some individual variation concerning the classes of verbs allowing restructuring was also reported by Cinque (2004: §8.3) and Egerland (2009). Using a grammaticality judgment task, Egerland



showed that climbing with modal verbs was accepted by all adult speakers he interviewed, while individual variation was found with aspectual and motion verbs.

Since motion verbs have full-fledged lexical usage (e.g. *Vado a casa* ‘I go home’), these data are not unexpected. As we said in section 2, lack of clitic climbing may mean lack of restructuring due to the lexical nature of the superordinate verb. These data show that motion verbs may be more frequently interpreted as being lexical than modal verbs, which are instead more frequently interpreted as being functional and therefore allowing higher proportions of clitic climbing.

We do not know if the results found in adult populations (both native and L2) extend to the L1 acquisition of Italian.

### 3.4. On clitic placement errors

In the L1 acquisition of Italian, clitic placement errors were never found in simple contexts (Varlokosta et al. 2016) and were also said to be absent in the few studies that analyzed modal + infinitive verbs (Schaeffer 2000; Bernardini and van der Weijer 2018). They were also not reported in the studies on the L1 acquisition of restructuring in Spanish and European Portuguese mentioned above.

Clitic placement errors in restructuring contexts were instead found in the bilingual/L2 acquisition of Italian. Bilingual German/Italian and French/Italian children placed the clitic pronoun in a position between the modal verb and the infinitive, calquing into Italian the distribution of Germanic middle-field weak pronouns and that of French clitic pronouns in restructuring contexts, respectively (Hamann and Belletti 2006; Ferrari 2006; Bernardini and Timofte 2017; Bernardini and van der Weijer 2018).

A systematic study of restructuring is needed to confirm that monolingual Italian children do not produce clitic placement errors.

### 3.5. Aims and predictions of this study

Previous literature has shown that a number of variables contribute to the acquisition of clitic pronouns (age and type of pronouns) and their placement in restructuring contexts (the clitic position and the type of restructuring verb). No study reported placement errors in monolingual acquisition. All studies dealt with sentences containing one single restructuring verb.

Using a repetition task containing sentences with one or two restructuring verbs, this study aims at answering the following research questions:

(i) Does the level of accuracy in the repetition of sentences with restructuring verbs increase with the increase of age?

(ii) Is the production of clitic pronouns in restructuring sensitive to phi-features (Person and Case)?

(iii) Does children’s accuracy depend on the number of restructuring verbs in the sentence and the number of clitic positions they make available?

(iv) Is there a preference for proclisis over enclisis, or clitic climbing over non-climbing?

(v) Is the modal vs. motion verb asymmetry found in adult productions and L2 acquisition also observed in L1 acquisition?

(vi) Is clitic misplacement in restructuring configurations confirmed not to arise in L1 acquisition?

We predict that children's accuracy improves with the increase of age. Like Eisenchlas (2003), we do not expect to find any differences depending on the Person or Case of the clitic pronouns as we use a repetition task. No difficulty in retrieving the correct forms of accusative 3<sup>rd</sup> person pronouns, which agree in number and gender with their antecedents, should thus emerge. We expect to find some differences between 2-verb and 3-verb sentences since the latter display a complex and infrequent sequence of verbs and make one more clitic position available than the former. Given that Structural Economy rules restructuring and that children are sensitive to Structural Economy in other aspects of grammar, e.g. they do not use strong pronouns instead of clitic pronouns unless necessary (Leonini 2006a, 2006b; Gundel and Johnson 2013), we predict that Italian children show a preference for proclisis/clitic climbing over enclisis/non-climbing, on a par with children acquiring Spanish and European Portuguese. The data from 3-verb sentences, where clitic climbing onto the intermediate verb produces enclisis (cf. (12)), will also clarify whether the preference is for the proclisis configuration, i.e., adjunction to a finite verb, or for climbing. Based on Lobo and Vitorino's (2021) analysis of Portuguese, where enclitics also appear with finite verbs, we expect that the correct generalization should be expressed as climbing vs. non-climbing. As for the different classes of restructuring verbs, if Structural Economy favors monoclausal structures, no difference should be found between modal and motion verbs in L1 acquisition. We also expect to confirm previous results that misplacement errors do not occur in monolingual L1 acquisition.

## 4. The study

### 4.1. Participants

178 Italian monolingual children took part in the study. Participants were recruited from preschools and primary schools in the areas of Milan and Pordenone in Northern Italy and Macerata in Central Italy. They were divided into 6 groups according to age, as shown in Table 1. All participants were typically developing children, with no diagnosis of language disorders, learning difficulties or other developmental disorders. A control group of 16 adults coming from the Milan area was also tested (age range 20-28, mean age 24).

**Table 1.** Number, age range, mean age and standard deviation (SD) of the groups of children

Group	#	Age	Mean (SD)
G1	25	4;9 – 5;11	5;33 (0.30)
G2	24	6 – 6;11	6;47 (0.31)
G3	37	7 – 7;11	7;38 (0.29)
G4	30	8 – 8;11	8;39 (0.28)
G5	39	9 – 9;11	9;41 (0.26)
G6	23	10 – 10;11	10;42 (0.33)

## 4.2. Materials

To elicit clitic pronouns in restructuring contexts, we used a repetition task. Repetition is widely used to test language competence (Klem et al. 2015; Fleckstein et al. 2018). In a repetition task, the participant must decode and interpret the sentence while hearing it and reconstruct it while repeating it (Lombardi and Potter 1992; Lust, Flynn and Foley 1996; Marinis and Armon-Lotem 2015; Polišenská et al. 2015). The alterations of the stimulus sentence may provide insights into the participants' grammatical knowledge. A repetition task also allows one to manipulate and assess complex structures that would be difficult to elicit or observe in spontaneous production (Devescovi and Caselli 2001, 2007; Del Puppo et al. 2016), like the sentences with more than one restructuring verb that we used.

The elicited repetition test, created by Cerutti (2018), includes 49 experimental sentences with clitic pronouns and restructuring verbs, plus 6 fillers of the same length (15/16 syllables).<sup>4</sup> The pronouns we tested are accusative 1<sup>st</sup>, 2<sup>nd</sup>, and masculine and feminine 3<sup>rd</sup> person singular clitics (*mi* 'me', *ti* 'you', *lo* 'him, it', *la* 'her, it') and dative 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> person singular clitics (*mi* 'to.me', *ti* 'to.you', *gli* 'to.him/to.her').<sup>5</sup> The restructuring verbs we used are modal verbs (*volere* 'want', *potere* 'can', *dovere* 'must') and motion verbs (*andare* 'go', *venire* 'come', *passare* 'go/come by'). Each sentence contains one or two restructuring verbs and appears in the test two or three times, with the clitic pronoun occurring in either one of the two (proclitic/enclitic) or three (proclitic/enclitic intermediate/enclitic final) available positions. The 3-verb sentences contain the sequence 'modal + motion verb', which is among the most natural combinations of restructuring verbs. The fillers are 2-verb sentences with either a modal or a motion verb + infinitive, but not containing any clitic pronouns. Table 2 illustrates examples of trials for 2-verb (with modal and motion verbs, respectively) and 3-verb experimental sentences, and Table 3 provides the structure of the task.

<sup>4</sup> A pilot test run with a small group of children attending primary school included shorter sentences (9-10 syllables). The children produced no repetition errors. The length of the stimuli was therefore increased, to make the task more demanding. One example is provided in (i).

- (i) Pilot test: Vogli-o dir=**lo** alla maestra (9 syllables)  
 want-PRS.1SG say.INF=it to.the teacher  
 'I want to say it to the teacher'
- Final version: Vogli-o dir=**lo** alla maestra dopo la lezione (15 syll.)  
 want-PRS.1SG say.INF=it to.the teacher after the lesson  
 'I want to say it to the teacher after the lesson'

The number of control sentences is admittedly low. We kept it so low in order not to make the test too long.

<sup>5</sup> The feminine dative pronoun *le* 'to.her' was excluded to prevent substitution errors. It is obsolete and no longer used in colloquial speech. In a task eliciting 3<sup>rd</sup> person dative clitic pronouns, *le* was indeed produced by primary-school children in minimal percentages (mean 2.6%) (Cardinaletti, Cerutti and Volpato 2021).

**Table 2.** Examples of experimental trials

N. of verbs	Clitic position	Example
2	proclitic (PRO) enclitic (ENC)	(i) <b>Gli</b> posso prestare il mio nuovo libro preferito (ii) Posso prestargli il mio nuovo libro preferito 'I can lend him/her my new favorite book'
2	proclitic (PRO) enclitic (ENC)	(iii) <b>Ti</b> vengo a trovare domenica nel pomeriggio (iv) Vengo a trovarti domenica nel pomeriggio 'I come to see you on Sunday in the afternoon'
3	proclitic (PRO) enclitic intermediate (ENC1) enclitic final (ENC2)	(v) <b>Mi</b> deve passare a prendere dopo la lezione (vi) Deve passarmi a prendere dopo la lezione (vii) Deve passare a prendermi dopo la lezione 'He must come by to pick me up after the lesson'

**Table 3.** Conditions tested and number of trials per condition

N. of verbs	Restructuring verb	Case	Clitic position
2-verbs: 28	modal: 14	ACC: 8	PRO: 4; ENC: 4
		DAT: 6	PRO: 3; ENC: 3
	motion: 14	ACC: 8	PRO: 4; ENC: 4
		DAT: 6	PRO: 3; ENC: 3
3-verbs: 21	modal + motion	ACC: 12	PRO: 4; ENC1: 4; ENC2: 4
		DAT: 9	PRO: 3; ENC1: 3; ENC2: 3

### 4.3. Procedure

Children were tested at school, in a quiet room. Consent for collecting data was obtained through a questionnaire. Parents were also required to answer a few questions about the language(s) spoken at home. All participants were growing up as monolinguals. Sentences were pseudo-randomized and organized in two different lists, containing the same stimuli in a different order. The test was divided into two parts, in order to allow children to take a break if they were feeling tired. Sessions lasted around 10-15 minutes. All children but two from group G5 completed the task. The children's answers were audio-recorded and later transcribed.

### 4.4. Coding

Verbatim repetitions of the experimental sentences were considered as target.

Among the repetition errors, only errors involving the position of the clitic pronouns were analyzed in detail and divided into 2 sub-categories: placement change, when the target pronoun was repeated in a different position, (14a); clitic reduplication, when children produced the target pronoun twice, namely in the target position and another available position (14b) (cf. (10)).

- (14) Target: ENC
- |  |             |           |                     |     |     |       |
|--|-------------|-----------|---------------------|-----|-----|-------|
|  | Poss-o      |           | prestar= <b>gli</b> | il  | mio | nuovo |
|  | can-PRS.1SG |           | lend.INF=to.him     | the | my  | new   |
|  | libro       | preferito |                     |     |     |       |
|  | book        | favorite  |                     |     |     |       |
- a. Placement change: ENC→PRO
- |            |             |  |          |     |     |       |
|------------|-------------|--|----------|-----|-----|-------|
| <b>Gli</b> | poss-o      |  | prestare | il  | mio | nuovo |
| to.him     | can-PRS.1SG |  | lend.INF | the | my  | new   |
| libro      | preferito   |  |          |     |     |       |
| book       | favorite    |  |          |     |     |       |
- b. Clitic reduplication: ENC+PRO
- |              |             |  |                     |     |     |       |
|--------------|-------------|--|---------------------|-----|-----|-------|
| # <b>Gli</b> | poss-o      |  | prestar= <b>gli</b> | il  | mio | nuovo |
| to.him       | can-PRS.1SG |  | lend.INF=to.him     | the | my  | new   |
| libro        | preferito   |  |                     |     |     |       |
| book         | favorite    |  |                     |     |     |       |
- ‘I can lend him/her my new favorite book’

In 2-verb sentences, two changes in clitic placement are possible and were produced by our participants: shifting the clitic from the proclitic to the enclitic position (PRO→ENC) or from the enclitic to the proclitic one (ENC→PRO), as in (14a). In 3-verb sentences, more changes are possible and were found in the participants’ responses: proclitic pronouns were shifted to the enclitic intermediate (PRO→ENC1) or enclitic final position (PRO→ENC2); pronouns in the first enclitic position were anticipated and became proclitic (ENC1→PRO) or were moved to the second infinitive (ENC1→ENC2); and finally, pronouns in the second enclitic position were anticipated onto the first infinitive (ENC2→ENC1) or moved all the way up to the proclitic position (ENC2→PRO). All resulting sentences were grammatical.

Clitic reduplications had the same possibilities. The pronoun was repeated in the same position as in the stimulus sentence and in another available clitic position. In example (14b), for instance, the enclitic pronoun of the stimulus was reduplicated in proclisis.

All other types of repetition errors were coded as “other errors”. They include omissions or substitutions of clitic pronouns and other elements of the sentence, i.e., prepositions, verb inflections, and lexical words. They are not analyzed in this paper.

No clitic misplacement errors were produced.

#### 4.5. Results

Between-group and within-group analyses were carried out through Generalized linear mixed-effect (GLME) models, using the statistical software R (R Development Core Team, 2018, R Version 4.0.1). Several GLME models were used, one for each independent variable. In each analysis, we will specify the relevant dependent and independent variables. In order to decide whether a predictor contributes significant

information to the model, a model including the predictor is contrasted against a model without it using a  $\chi^2$ -test (Jaeger 2008).

A preliminary analysis consisted in comparing the overall performance of the children who were tested with the two lists of sentences, to make sure that the order in which the sentences were presented did not affect the results. The analysis considered List as an independent fixed factor, Response accuracy was the dependent variable, and Subject and Item were considered as random factors. We found that List was not a significant predictor of performance ( $\chi^2(1) = 0.212$ ,  $p = .645$ ), therefore all children were grouped together.

In the following sections, we present the analyses conducted considering different predictors, namely:

1. Age
2. Type of pronoun: Case (acc vs. dat) and Person (1<sup>st</sup> and 2<sup>nd</sup> vs. 3<sup>rd</sup>)
3. Sentence type (2-verbs vs. 3-verbs)
4. Clitic position (proclisis vs. enclisis)
5. Type of restructuring verb (modal vs. motion) in 2-verb sentences

#### 4.5.1. Age

Table 4 provides mean scores, standard deviations and percentages of target answers, placement changes, clitic reduplications, and other types of errors for each age group.

**Table 4.** Mean scores, standard deviations (SD), and percentages of answers in each age group

Group	Target		Placement change		Clitic reduplication		Other errors
	Mean score/49 (SD)	%	Mean score/49 (SD)	%	Mean score/49 (SD)	%	%
G1	33.88 (11.70)	69.14	6.44 (4.79)	13.14	0.48 (0.82)	0.98	16.74
G2	31.29 (10.22)	63.86	8.54 (4.50)	17.42	1.08 (1.69)	2.20	16.52
G3	38.27 (6.85)	78.10	5.05 (5.11)	10.31	1.27 (1.56)	2.59	9
G4	39.70 (7.48)	81.02	4.40 (4.29)	8.98	0.53 (1.31)	1.08	8.92
G5	43.23 (5.12)	88.22	3.28 (3.26)	6.69	0.18 (0.51)	0.37	4.72
G6	44.74 (3.74)	91.31	1.91 (1.86)	3.90	0.61 (1.17)	1.24	3.55
Adults	48.13 (1.32)	98.22	0.88 (1.32)	1.78	---	---	---

Adults performed almost at ceiling (mean: 98.22%). Children overall improved with the increase of age, with the only exception of G2. Placement change was the most frequent error for all groups of children except for G1 (mean: 10.07%). Placement change was the only error sporadically observed in the adult production. Since adults performed almost at ceiling, in the following analyses only children's performance will be considered.

The first analysis was conducted considering Group as an independent fixed factor, Response accuracy was the dependent variable, and Subject and Item were

considered as random factors.<sup>6</sup> Group is a significant predictor of performance:  $\chi^2(5) = 56.234$ ,  $p < .001$ . Table 5 shows the comparisons between the different levels of the Group variable.

**Table 5.** Estimate, Standard error, Z value, and p-value of the comparison between the different age groups

Analysis between groups	Estimate	Std. Error	z value	p
G1 vs. G2	0.3268	0.3396	0.962	.956
G1 vs. G3	0.5683	0.3103	1.831	.067
G1 vs. G4	0.8723	0.3264	2.672	< .01
G1 vs. G5	1.5437	0.3122	4.944	< .001
G1 vs. G6	1.9395	0.3591	5.041	< .001
G2 vs. G3	0.8951	0.3122	2.867	< .01
G2 vs. G4	1.1991	0.3282	3.653	< .001
G2 vs. G5	1.8705	0.3142	5.954	< .001
G2 vs. G6	2.2663	0.3607	6.283	< .001
G3 vs. G4	0.3041	0.2975	1.022	.307
G3 vs. G5	0.9754	0.2818	3.461	< .001
G3 vs. G6	1.3713	0.3331	4.117	< .001
G4 vs. G5	0.6714	0.2991	2.245	< .05
G4 vs. G6	1.0672	0.3476	3.070	< .01
G5 vs. G6	0.3958	0.3340	1.185	.236

Even if the percentage of target answers of Group 2 was lower than Group 1 (Table 4), no significant difference was found in the comparison between the two groups.

#### 4.5.2. Type of pronoun: Case (acc vs. dat) and Person (1<sup>st</sup> and 2<sup>nd</sup> vs. 3<sup>rd</sup>)

In this analysis, we investigated the differences between direct and indirect pronouns, and between 1<sup>st</sup> and 2<sup>nd</sup> person versus 3<sup>rd</sup> person pronouns. Table 6 shows mean scores, standard deviations, and percentages of target sentences considering these variables.

**Table 6.** Mean scores, standard deviations (SD), and percentages of target sentences for Case and Person factors

Variable	Levels of the variable	Target answers
<i>Case</i>	accusative	23.38/28 (5.20) 83.5%
	dative	15.43/21 (4.23) 73.48%
<i>Person</i>	1 <sup>st</sup> and 2 <sup>nd</sup>	22.16/28 (5.31) 79.14%
	3 <sup>rd</sup>	16.65/21 (4.03) 79.28%

<sup>6</sup> The R-code used to perform the analysis is: `glmer (dataset$ACCURACY ~ dataset$GROUP + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

In the second analysis of our study, Case was considered as the independent fixed factor, response accuracy as the dependent variable, and Subject and Item were considered as random factors.<sup>7</sup> Case was a significant predictor of performance:  $\chi^2(1) = 4.011$ ,  $p = .045$ . Children were more accurate in the repetition of sentences containing accusative pronouns (Est = 0.46, SE = 0.22, Wald Z = 2.06,  $p = .039$ ).

In the third analysis, 1<sup>st</sup> and 2<sup>nd</sup> person pronouns were compared to 3<sup>rd</sup> person pronouns. We considered Person as the independent fixed factor, Response accuracy as the dependent variable, and Subject and Item as random factors.<sup>8</sup> The person of the pronoun did not influence accuracy ( $\chi^2(1) = 0.027$ ,  $p = .868$ ). We also investigated interaction effects between Person and Case, but the analysis did not yield any significant result ( $p = .485$ ).

#### 4.5.3. Sentence type (2-verbs vs. 3-verbs)

In the fourth analysis, Sentence type (2-verb vs. 3-verb sentences) was considered, to observe how this variable affects (a) accuracy in the repetition of different types of sentences; (b) the production of clitic placement changes. Table 7 shows mean scores, standard deviations, and percentages of target sentences and placement changes based on sentence type.

**Table 7.** Mean scores, standard deviations (SD), and percentages of target sentences and placement change in 2-verb and 3-verb sentences

Sentence type	Target answers	Placement change
2-verbs	24.04/28 (4.93) 85.86%	1.21/28 (2.28) 4.32%
3-verbs	14.83/21 (4.34) 70.62%	3.57/21 (2.73) 17%

Children were more accurate in the repetition of 2-verb sentences, for which the percentage of placement changes is lower than in 3-verbs sentences. We first conducted an analysis (a) considering Sentence type as the independent fixed factor, Accuracy as the dependent variable, and Subject and Item as random factors.<sup>9</sup> Sentence type is a significant predictor of performance:  $\chi^2(1) = 8.825$ ,  $p < .001$ . Children were more accurate in the repetition of 2-verb sentences (Est = 1.193, SE = 0.248, Wald Z = 4.804,  $p < .001$ ).

We then considered how Sentence Type (2-verbs or 3-verbs) affected the production of placement changes. The analysis (b) was conducted considering Sentence type as the independent fixed factor, the production of a placement change as the dependent variable, and Subject and Item were considered as random factors.<sup>10</sup>

<sup>7</sup> The R-code used to perform this analysis is: `glmer (dataset$ACCURACY ~ dataset$CASE + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

<sup>8</sup> The R-code used to perform this analysis is: `glmer (dataset$ACCURACY ~ dataset$PERSON + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

<sup>9</sup> The R-code used to perform this analysis is: `glmer (dataset$ACCURACY ~ dataset$N_VERBS + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

<sup>10</sup> The R-code used to perform this analysis is: `glmer (dataset$PLACEMENT ~ dataset$N_VERBS + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.



Sentence type also predicts placement changes:  $\chi^2(1) = 2649$ ,  $p < .001$ . Children changed the position of the pronoun more frequently in 3-verb sentences (Est = 1.824, SE = 0.375, Wald Z = 4.865,  $p < .001$ ).

#### 4.5.4. Clitic position (*proclisis vs. enclisis*)

In the fifth analysis, we investigated how the initial position of the clitic pronoun affected (a) general accuracy in sentence repetition; (b) the production of placement changes. Table 8 shows mean scores, standard deviations, and percentages of target sentences based on the initial position of the clitic pronouns in 2-verb and 3-verb sentences. In both types of sentences, the proclitic position is the most accurate.

**Table 8.** Mean scores, standard deviations (SD), and percentages of target sentences based on the initial position of the clitic pronouns in each sentence type

Sentence type	Initial position	Target answers
2-verbs	PRO	12.52/14 (2.11) 89.43%
	ENC	11.52/14 (3.21) 82.28%
3-verbs	PRO	5.31/7 (11.31) 75.86%
	ENC1	4.75/7 (2.02) 67.86%
	ENC2	4.77/7 (2.35) 68.14%

The first analysis (a) was conducted considering the initial position of the clitic pronoun as the independent fixed factor, Accuracy as the dependent variable, and Subject and Item were considered as random factors.<sup>11</sup> Clitic position is a significant predictor of Accuracy:  $\chi^2(4) = 55.375$ ,  $p < .001$ . In Table 9, comparisons between the different experimental conditions are reported.

**Table 9.** Estimated coefficients, standard errors, Z-values, and associated p-values for Clitic position factor broken down by sentence type

Sentence type	Clitic position	Estimate	Std. Error	z value	p
2-verbs	PRO vs ENC	0.794	0.229	3.463	< .001
3-verbs	PRO vs ENC1	1.419	0.322	4.405	< .001
	PRO vs ENC2	1.745	0.297	5.861	< .001
	ENC1 vs ENC2	0.325	0.297	1.094	.274

The proclitic position is significantly more accurate than the enclitic position(s) in both 2-verb and 3-verb sentences.

We then focused on how the clitic position affected the production of placement changes. Table 10 shows the amount of placement changes produced by

<sup>11</sup> The R-code used to perform this analysis is: `glmer (dataset$ACCURACY ~ dataset$POSITION + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

children in 2-verb and 3-verb sentences. More placement changes were found when the initial position of the pronoun was enclitic.

**Table 10.** Mean scores, standard deviations (SD), and percentages of placement change based on the initial position of the clitic pronouns in each sentence type

Sentence type	Initial position	Placement change
2-verbs	PRO	0.19/28 (0.60) 0.68%
	ENC	1.02/28 (2.13) 3.64%
3-verbs	PRO	0.22/21 (0.67) 1.05%
	ENC1	1.30/21 (1.51) 6.19%
	ENC2	2.05/21 (1.84) 9.76%

A statistical analysis (b) was then conducted considering Clitic position as the independent fixed factor, the production of placement changes as the dependent variable, and Subject and Item were considered as random factors.<sup>12</sup> The initial position of the clitic pronoun significantly predicts the production of placement changes:  $\chi^2(4) = 2700.7$ ,  $p < .001$ . In Table 11, the comparison between the different experimental conditions is reported.

**Table 11.** Estimated coefficients, standard errors, Z-values, and associated p-values for Clitic position factor in each sentence type

Sentence type	Clitic position	Estimate	Std. Error	z value	p
2-verbs	PRO vs ENC	1.862	0.310	6.007	< .001
3-verbs	PRO vs ENC1	2.062	0.395	5.219	< .001
	PRO vs ENC2	2.483	0.383	6.478	< .001
	ENC1 vs ENC2	0.421	0.340	1.239	.216

Placement changes were significantly more frequent when the pronoun was in enclitic position.

#### 4.5.4.1. Direction of clitic placement change

We looked into the directions of clitic placement changes in more detail. For 2-verb sentences, where only two possible changes were possible, the data already appeared in Table 10, but for convenience, we provide them again in Table 12.

<sup>12</sup> The R-code used to perform this analysis is: `glmer (dataset$PLACEMENT ~ dataset$POSITION + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

**Table 12.** Mean scores, standard deviations (SD), and percentages of placement changes in 2-verb sentences

Placement change in 2-verb sentences		
Mean score (SD)	<i>PRO</i> → <i>ENC</i>	<i>ENC</i> → <i>PRO</i>
1.21/28 (2.28) 4.32%	0.19/28 (0.60) 0.68%	1.02/28 (2.13) 3.64%

In 2-verb sentences, the most frequent placement change involved the enclitic pronouns, which were repositioned in the proclitic position (*ENC* → *PRO*), as in the example (14a) above. In 3-verb sentences, the most frequent changes involved the two enclitic positions. The pronoun was mostly anticipated from *ENC2* to *ENC1*, as in (15), but *ENC2* was also targeted. Clitics in *ENC1* were also sometimes repositioned in proclisis. The other changes had lower occurrences. Table 13 shows mean scores, standard deviations, and percentages of placement changes in 3-verb sentences.

- (15) Target: *ENC2*    Dev-e            passare            a prender=**mi**  
                                  must-PRS.3SG come.by.INF    to pick.up.INF=me  
                                  dopo la lezione  
                                  after the lesson
- Produced: *ENC1*    Dev-e            passar=**mi**            a prendere  
                                  must-PRS.3SG come.by.INF=me to pick.up.INF  
                                  dopo la lezione  
                                  after the lesson  
                                  ‘He must come by to pick me up after the lesson’

**Table 13.** Mean scores, standard deviations (SD), and percentages of placement changes in 3-verb sentences

Placement changes in 3-verb sentences						
Mean score (SD)	<i>PRO</i> → <i>ENC1</i>	<i>PRO</i> → <i>ENC2</i>	<i>ENC1</i> → <i>PRO</i>	<i>ENC1</i> → <i>ENC2</i>	<i>ENC2</i> → <i>ENC1</i>	<i>ENC2</i> → <i>PRO</i>
3.57/21 (2.73) 17%	0.13/21 (0.55) 0.62%	0.09/21 (0.27) 0.43%	0.46/21 (1.08) 2.19%	0.84/21 (1.17) 4%	1.79/21 (1.70) 8.52%	0.26/21 (0.78) 1.24%

In the adult group, only 6 participants produced placement changes (1.78%). They were only found in 3-verb sentences and only involved the enclitic positions. One adult moved the pronoun from *ENC2* to *ENC1* once; five adults moved the pronoun from *ENC1* to *ENC2* 13 times in total. An example is provided in (16).

- (16) Target: *ENC1*    Dev-e            venir=**mi**            a ripetere  
                                  must-PRS.3SG come.INF=to.me to repeat.INF  
                                  tutto di nuovo  
                                  all of new

Produced: ENC2 Dev-e venire a ripeter=**mi**  
 must-PRS.3SG come.INF to repeat.INF=to.me  
 tutto di nuovo  
 all of new  
 ‘He must come to again repeat everything to me’

#### 4.5.4.2. Clitic reduplication

Interesting data also emerged from clitic reduplication, i.e., the clitic pronoun was repeated twice, in the target position and another available position.<sup>13</sup> This type of sentence was produced by 59 children. No adult produced clitic reduplication. Table 14 reports mean scores, standard deviations, and percentages of clitic reduplication in 2-verb and 3-verb sentences.

**Table 14.** Mean scores, standard deviations (SD), and percentages of clitic reduplication in 2-verb and 3-verb sentences

Clitic reduplication								
	2-verb sentences mean score/28 (SD)		3-verb sentences mean score/21 (SD)					
	PRO + ENC	ENC + PRO	PRO + ENC1	PRO + ENC2	ENC1 + ENC2	ENC1 + PRO	ENC2 + ENC1	ENC2 + PRO
<b>Mean</b>	0.01 (0.03) 0.03%	0.17 (0.26) 0.61%	0.12 (0.11) 0.57%	0.27 (0.31) 1.28%	0.13 (0.28) 0.62%	0.16 (0.27) 0.76%	0.05 (0.07) 0.24%	0.09 (0.10) 0.42%

Despite the very small total amount of this kind of answers (mean 0.69/49, 1.41%), which does not allow any statistical analysis, clitic reduplication partially confirmed the patterns observed in placement changes: (i) there were more reduplications in 3-verb than 2-verb sentences; (ii) in 2-verb sentences, reduplication mostly involved the stimuli containing enclitics: the pronoun was reduplicated in proclisis, as shown in (14b) above; (iii) in 3-verb sentences, reduplication mostly involved the proclitic and the ENC1 position: the pronoun in proclisis was reduplicated in one of the two enclitic positions, most often in ENC2 (17); the pronoun in ENC1 was reduplicated in either direction, most often in proclisis (18).

- (17) Target: PRO **Mi** dev-e passare a prendere  
 me must-PRS.3SG come.by.INF to pick.up.INF  
 dopo la lezione  
 after the lesson  
 Produced: **Mi** dev-e passare a prender=**mi**  
 PRO + ENC2 me must-PRS.3SG come.by.INF to pick.up.INF=me  
 dopo la lezione  
 after the lesson  
 ‘He must come by to pick me up after the lesson’

<sup>13</sup> In no case was the clitic produced three times (e.g. \***Mi** deve passarmi a prendermi dopo la lezione; cf. (17)).

- (18) Target: ENC1 Poss-o venir=**ti** a portare  
 can-PRS.1SG come.INF=to.you to bring.INF  
 la spesa a casa  
 the shopping to home  
 Produced: **Ti** poss-o venir=**ti** a portare  
 ENC1 + PRO to.you can-PRS.1SG come.INF=to.you to bring.INF  
 la spesa a casa  
 the shopping to home  
 ‘I can come to take your groceries home’

#### 4.5.5. Type of restructuring verb (modal vs. motion) in 2-verb sentences

In the last analysis, we investigated the difference between modal and motion verbs, to verify whether Verb type predicts (a) accuracy; (b) the production of placement changes. Table 15 shows mean scores, standard deviations, and percentages of target sentences and placement changes based on verb type.

**Table 15.** Mean scores, standard deviations (SD), and percentages of target sentences and placement change broken in modal and motion verbs

Type of verb	Target answers	Placement change
<i>Modal</i>	12.12/14 (2.59) 86.57%	0.66/14 (1.21) 4.71%
<i>Motion</i>	11.92/14 (2.65) 85.14%	0.55/14 (1.22) 3.93%

The percentage of target answers is higher for modal than for motion verbs, and placement changes are more frequent for modal verbs. We first conducted an analysis (a) considering Verb type as the independent fixed factor, Accuracy as the dependent variable, and Subject and Item were considered as random factors.<sup>14</sup> Verb type does not predict Accuracy:  $\chi^2(1) = 0.358$ ,  $p = .550$ . A second analysis (b) was then conducted considering Sentence type as the independent fixed factor, the production of a placement change as the dependent variable, and Subject and Item were considered as random factors.<sup>15</sup> Verb type does not predict the production of placement changes:  $\chi^2(1) = 1.065$ ,  $p = .302$ .

## 5. Discussion

This study addressed the production of clitic pronouns in restructuring contexts by Italian monolingual children using a repetition task containing sentences with one or two restructuring verbs. We first asked very general questions about whether (i) accuracy increases with age and (ii) any difference among different types of clitic pronouns emerges in restructuring. Focusing on clitic placement, we tested whether

<sup>14</sup> The R-code used to perform this analysis is: `glmer (dataset$ACCURACY ~ dataset$VERB + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

<sup>15</sup> The R-code used to perform this analysis is: `glmer (dataset$PLACEMENT ~ dataset$VERB + (1 | SUBJ) + (1 | ITEM), data = dataset, family = "binomial")`.

(iii) children are more accurate in sentences containing one or two restructuring verbs, (iv) they have a preference for either proclisis or enclisis, (v) the modal vs. motion verb asymmetry observed in adults and L2 acquisition is also found in L1 acquisition, and (vi) clitic misplacement in restructuring configurations is confirmed not to arise in L1 acquisition. Most predictions were borne out.

Accuracy improved with the increase of age. This is not a surprising result given that the production of clitic pronouns (and memory skills as well) improves with the increase of age. The youngest groups of children (G1 and G2) produced more “other errors” than the other groups because they more often omitted and/or substituted the clitic pronouns. At preschool age and beginning of the primary school, clitic pronouns are not fully mastered yet. Placement changes diminished with increasing age. As we argue below, placement changes have to do with the analysis children assume of restructuring verbs. A small amount of clitic reduplication was found in all groups of children, suggesting that it may be considered as an available, though marginal option in the language (cf. the discussion around (10)).

As expected given the task we used, Person features did not influence accuracy, while Case was unexpectedly a significant predictor of performance. Children were slightly more accurate when they repeated sentences containing accusative pronouns. We suggest that the Case effect may be due to the lower complexity of the sentences with accusative pronouns, which contained one argument less than the sentences with dative pronouns. This hypothesis should be verified with a test containing ditransitive verbs in both Case conditions. No interaction between Person and Case was found. This result expectedly differs from Cardinaletti, Cerutti and Volpato’s (2021) results, which pointed out a persistent difficulty in retrieving 3<sup>rd</sup> person accusative pronouns in an elicited production task because they agree with their antecedents. In the repetition task of this study, the target pronoun was already present in the stimulus sentence, and no peculiar difficulty in retrieving agreeing pronouns was observed.

Overall, children showed good competence of clitic placement in restructuring, being able to provide target answers in high percentages (see Table 4). Two important asymmetries emerged considering both accuracy and placement changes: between 2- and 3-verb sentences and between proclisis and enclisis, while no difference was found between modal and motion verbs.

Children were significantly more accurate in the repetition of 2-verb sentences, and more placement changes were produced in 3-verb sentences (Table 7). Since the sentences had the same length (in number of syllables), this difference cannot simply be attributed to memory resources. 3-verb sentences are admittedly complex because they contain an infrequent sequence of functional elements, although modal + motion is among the most natural combinations of restructuring verbs. Furthermore, the presence of two restructuring verbs made one more clitic position available than in 2-verb sentences, and therefore more options for clitic repositioning became possible. Children made use of these possibilities while repeating the sentences. This shows that children have competence of the different clitic positions made available by restructuring verbs. This is a new result as no previous study tested sentences containing two restructuring verbs.

Children were significantly more accurate in the repetition of proclitic pronouns, in both 2-verb and 3-verb sentences (Tables 8 and 9). The same result was found by Eisenclas (2003) for Spanish based on the repetition of sentences containing one restructuring verb. While hearing a sentence containing a restructuring verb and

displaying proclisis, children analyzed it as a simple sentence and applied clitic climbing when reproducing it. This suggests that the functional analysis of restructuring verbs and the operation of clitic climbing are fully available to children. There was instead no significant difference between ENC1 and ENC2 in 3-verb sentences (Table 9). Enclitic intermediate and enclitic final pronouns are equivalent in that in both cases, the infinitival verb left-adjoins to the pronoun, which prevents climbing to the highest position; in both cases, the modal verb may be analyzed as either a functional verb or, most preferably, a lexical verb selecting for a richer embedded structure (cf. (13)). Children correctly made use of these possible analyses of sentences displaying enclitics.

The full availability of restructuring and clitic climbing is testified not only by the higher accuracy in repeating sentences with proclitics, but also by the directions of children's placement changes. While repeating 2-verb sentences, the statistically significant tendency was to reposition the enclitic pronoun in proclisis rather than shifting it in the opposite direction (Table 11). The same result was obtained by Eisenclas (2003) with Spanish children. We suggest that children's grammar is guided by Structural Economy, like adults' grammar. Since the stimuli did not present any cue to a biclausal analysis, they were interpreted as monoclausal, and clitic climbing was preferred over producing the pronoun in enclisis (cf. (8a) vs. (8b) for the preference of clitic climbing in adults' judgements).

In 3-verb sentences, a similar tendency emerged. Placement change ENC2→ENC1 occurred more often than ENC1→ENC2. In their repetitions, children kept the clitic pronoun in enclitic position but most often used the smallest structure compatible with enclisis, namely the one in which the motion verb is analyzed as functional and builds a single clause with the lexical verb, with climbing occurring inside that clause (see (12a)). This result clearly shows that children's preference is not for proclisis on finite verbs over enclisis, but for climbing over non-climbing (cf. Lobo and Vitorino 2021). In the responses which displayed the change ENC1→PRO, children produced monoclausal structures and applied clitic climbing (see (11)). Structural Economy accounts for these cases as well.

This analysis is somehow supported by the directions of clitic reduplications (Table 14). In 2-verb sentences, enclitic pronouns were reduplicated in proclisis most often, once again showing a tendency for children to analyze the stimulus sentence as monoclausal and apply clitic climbing while reproducing it. In 3-verb sentences, results were less clear. PRO was targeted when the stimuli displayed the pronoun in either ENC1 or ENC2, showing once again that children produced a monoclausal structure and applied clitic climbing while also spelling out the clitic in the enclitic position of the stimulus sentence. Otherwise, the lowest clitic position, namely ENC2, was targeted by reduplication. Children reconstructed the clitic pronoun in the lowest possible clitic position. But the other possible combinations were also produced.

To sum up the results to answer our fourth research question, children preferred to produce clitic climbing over non-climbing. This result replicates Eisenclas' (2003) findings on Spanish based on the repetition of 2-verb sentences and are in line with Bernardini and van der Weijer's (2018) preliminary results on Italian and Lobo and Vitorino's (2021) findings on European Portuguese based on elicited production data. Spontaneous production also goes in the same direction (Lobo and Vitorino 2021). With restructuring verbs, children's preferred structure is monoclausal, and the preferred clitic position(s) is the one(s) targeted by clitic climbing. Once they realize

that their language allows for restructuring, children apply clitic climbing as the unmarked option. The enclisis/non-climbing option is also available, but dispreferred. It implies assuming a double analysis for restructuring verbs, not only as functional but also as lexical verbs. The assumption that restructuring verbs may have a double analysis increases with the increase of age. Monolingual acquisition differs from L2/bilingual acquisition, when children and adults tend to produce sentences with enclisis (Bennati and Matteini 2006; Bennati 2007; Pérez-Leroux, Cuza and Thomas 2011; Duffield and White 1999), implying a short dependency and preferably a biclausal analysis of the structure. Data from Bennati and Matteini (2006) and Bennati (2007) have shown that L2 learners' knowledge of the class of restructuring verbs develops gradually, and that the process is faster for modal verbs than motion verbs. L2 learners first treat restructuring verbs like any verb selecting an embedded infinitival clause, and it takes time for them to resort to the functional analysis of these verbs.

Turning to our fifth research question, namely the role of verb type in 2-verb sentences, we did not find any statistical difference between modal and motion verbs, as expected (Table 15). Once children classified both classes of verbs as restructuring, Structural Economy applied to both configurations. Once the monoclausal analysis was assumed, clitic climbing was preferred in both cases. This analysis is supported by children's frequent change ENC2→ENC1 in 3-verb sentences. As said above, enclisis on the intermediate, motion verbs in 3-verb sentences implies that these verbs were analyzed as restructuring. Adults' (very few, 1.78%) placement changes went in the opposite direction, namely from ENC1 to ENC2, pointing to the lexical analysis of motion verbs and a resulting richer embedded structure (cf. (13a,b)). Adults seem to display more flexibility in assuming different possible structural analyses for verbs that have an independent lexical usage, like motion verbs. This result is in line with the lower rate of clitic climbing found with motion than modal verbs in previous studies on adults (Bennati and Matteini 2006, Bennati 2007).<sup>16</sup>

As for the last research question, although children often changed the position of the clitic pronouns while repeating the sentences, they never produced misplacement errors. Our study of Italian restructuring configurations replicated previous findings that monolingual children never produce clitic pronouns in illicit positions.

Before concluding, a possible different analysis of the data is worth mentioning. Since in the proclisis stimuli, the pronouns occur in first position, the preference for proclisis could be attributed to a primacy effect. It is well-known that at the beginning of the sentence, attention is high, and the load on working memory low (e.g., Alloway and Gathercole 2005). Being in the initial position of the sentence, proclitic pronouns were more salient and therefore easier to remember. The Primacy hypothesis is however not sufficient to account for the data. It does not account for the different percentages of accurate proclitics in 2-verb and 3-verb sentences (Table 8) and for the preferred directions of placement changes, in particular the change ENC2→ENC1 in 3-verb sentences. Furthermore, it is unexpected that in both 2-verb and 3-verb sentences, children also sometimes repositioned proclitics into the enclitic

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<sup>16</sup> The results are similar despite the differences between our study and Bennati and Matteini's (2006) study: adult speakers from the North vs. Central/Southern speakers, repetition vs. elicited production, sentences with 2 vs. 1 restructuring verb. The asymmetry is worth exploring further.



position(s). Finally, this hypothesis does not predict clitic reduplications. In particular, it is unclear why children doubled proclitic pronouns with pronouns in lower positions. In order to fully exclude a primacy effect, an anonymous reviewer suggested that a new study should include test items in which the proclitic pronouns are placed after the subject or a sentence-initial adjunct. This would replicate Eisenchlas' (2003) elicited imitation study, which dealt with sentences containing proclitic pronouns in second (after the subject) or third position (after an adjunct and the subject). Given that Eisenchlas found a clear preference for climbing over enclisis in the conditions suggested by the reviewer, we expect that the new experiment will generate the same results as this study.

## 6. Conclusions

In a sentence-repetition task containing one or two restructuring verbs, Italian children showed good competence of the complexities of restructuring and a clear preference for clitic climbing over non-climbing. On the one hand, sentences with proclitics were repeated verbatim in significantly higher proportions than sentences with enclitics. On the other hand, placement changes were mostly from ENC to PRO in 2-verb sentences and from ENC2 to ENC1 in 3-verb sentences. Both results can be explained by hypothesizing that children prefer smaller structures despite the long dependency established by clitic climbing and that their grammar is guided by the interplay of Structural Economy and Derivational Economy, like adults' grammar. Modal and motion verbs were equally treated as restructuring. No clitic misplacement errors were produced, replicating previous findings on monolingual acquisition.

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