# Selected Proceedings of the Romance Turn IV Workshop on the Acquisition of Romance Languages

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Edited by

Sandrine Ferré, Philippe Prévost, Laurice Tuller, and Rasha Zebib

**CAMBRIDGE
SCHOLARS**

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# PREFACE

The Romance Turn (RT) is a workshop on study of the acquisition of Romance languages from a generative perspective. The present volume contains 15 selected papers from the fourth edition of this workshop which was held at Université François Rabelais, Tours (France) on 25-27August 2010. For this edition, all the participants who either gave an oral presentation or had a poster on display were invited to contribute. The resulting volume reflects the diversity of interests of the contributors, not only in the learning contexts investigated (first language acquisition, typical or impaired, and bilingualism), but also in the languages under examination (Basque, French, Italian, Brazilian Portuguese, European Portuguese, Spanish, and even Modern Greek and Cypriot Greek, with comparison to various Romance languages). A wide range of linguistic properties and phenomena are also targeted, such as lexical aspects, interface phenomena, object and subject pronouns, and relative clauses. Such a variety allows for multiple comparisons, which corresponds to the objective of the Romance Turn which is to provide an interactive platform between researchers working on similar topics from different perspectives, in an effort to better understand the process of language acquisition as a whole. Finally, it is worth pointing out that although most contributions focus on morphosyntactic development, one paper targets the acquisition of phonology (Ramalho & Freitas), a first in the proceedings of this workshop. We hope that this will encourage researchers in this domain to participate to future editions of the Romance Turn.

We would like to express our gratitude to two of our plenary speakers, Adriana Belletti and Maria-João Freitas for accepting to include their presentations in the proceedings. We also wish to thank all the reviewers who generously agreed to evaluate the abstracts for the workshop and the papers for these proceedings. Each submission, in both instances, underwent blind review by at least two external scholars. Finally, we thank all of the presenters, including those who did not submit their papers to the proceedings, for making RT4 a success.

This workshop has received financial support from various sources, which we would like to acknowledge. From the University François-Rabelais of Tours, we received support from the Scientific Council, the Faculty of Letters and Languages, the International Relations Service, and

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# PLENARY PRESENTATIONS

# CONSIDERING THE COMPLEXITY
## OF RELATIVE CLAUSES AND PASSIVE
## FROM THE ITALIAN PERSPECTIVE[*]

# ADRIANA BELLETTI

## Introduction

It is a well-known and widely discussed fact in the literature that object relatives are hard for (young) children to both comprehend and produce (e.g. Adani et al., 2010; Brown, 1972; Crain et al., 1990; Hamburger & Crain, 1979; Mc Kee et al., 1998; Tavakolian, 1981, a.o.), and are slowly processed by adults (e.g. De Vincenzi, 1991; Gordon et al., 2001; Warren & Gibson, 2002, a.o.). This work will concentrate mainly on the discussion of one crucial experimental result in Italian, which is robustly found in both adults and (older) children, and also reproduced across languages: passive is made use of extensively in the computation of a relative clause, as a substitute for an active object relative (OR, henceforth) in production; elicited ORs are frequently transformed into a subject relative (SR, henceforth) in the passive, yielding what I will refer to as a Passive Object Relative (Belletti, 2009, 2010; Belletti & Contemori, 2010; Belletti & Rizzi, 2010). In children, use of Passive Object Relatives starts out at the age in which passive productively develops, which occurs at around age 5-6, in Italian[1].

Newly collected results from comprehension (Contemori & Belletti, 2010), clearly indicated that Passive Object Relatives are also well comprehended by children at the age in which they adequately master passive, better than active ORs, both with a gap and with (clitic) resumption, a colloquial form of ORs in current Italian.

Thus, the use of passive to compute an OR over an active OR that these results indicate may be especially significant in revealing the nature of the complexity implied by the respective computations of (active) ORs and passive. It is also revealing of the developmental path, as children tend to approach the adult's behavior, for which preference for use of passive in the adopted experimental conditions may be overwhelming. The adult's

behavior can be taken to evidence the optimal computation in this domain. A crucial question which will be addressed in this work is precisely: in what sense should use of passive be optimal in the domain of ORs?

In section 2, a general outline of the experimental results is provided, which will constitute the basis for the discussion in section 3. In section 3 an account for the preference for Passive Object Relatives over active ORs is developed in terms of the Relativized Minimality locality principle (Rizzi 1990, 2004)), along the lines presented in Friedmann, Belletti & Rizzi (2009). The locality principle will ultimately be held responsible for distinguishing between the complexity of the two structures: Passive (Object Relatives), on the one side, and (active) ORs on the other, on principled grounds.

In the conclusion, directions for future research aiming at a fine-grained typology of the application of the principle and its implications for acquisition and processing will be briefly explored.

## 2. Outline of the results

This section reviews some of the main results on which the discussion of section 3 will concentrate. The main bulk of the Italian data is based on Belletti & Contemori (2010) and Contemori & Belletti (2010), which contain all relevant details of the experimental designs whose results will be considered here, and develop precise analyses of them. They also deal with further specific aspects of the results which will not be addressed in the present article. New data recently collected are presented in 2.1.1, which investigate the production of Passive Object Relatives by adults, in unexpected contexts containing the verb *volere* 'want', a verb which does not tolerate passivization.

On average, ORs are comprehended at chance by children (around 50% of the sentences tested), as recently illustrated in the study by Contemori & Garraffa (2010), with a picture matching task run in Italian with children aged 3 to 5;5 (see also Arosio et al., 2009; Adani, van der Lely, Forgiarini & Guasti, 2010). Comparable percentages have been found for headed ORs in the Hebrew data presented in Friedmann et al. (2009), in children of the same age. In contrast, SRs are both produced and comprehended already at the youngest age: e.g. up to 79% correct SRs are produced at age 3:4-3:11 in the elicitation experiment presented in Belletti & Contemori (2010), 70% in the average, with variants of the same preference production task, discussed in Contemori & Belletti (2010).

In contrast, both ORs and SRs are comprehended well by adult Italian speakers, although ORs are known to be harder/slower to process (in line

with comparable A' dependencies; De Vincenzi, 1991; De Vincenzi et al., 1999). In production, however, in the same eliciting experimental conditions set for children, ORs are overwhelmingly avoided by Italian adults (Contemori & Belletti, 2010). They are produced only in about 10% of the elicited cases. These results are reviewed in further detail in section 2.1 below.[2]

## 2.1 Elicited production of SR and OR: The essential features of the experimental designs

The elicitation technique utilized is an adaptation of the original preference task presented in Novogrosky & Friedmann (2006). Different conditions have been tested in the elicitation of Italian ORs, with e.g. number match and number mismatch between the relative head and the subject of the relative clause. Since the different conditions, however, do not significantly change the overall aspect of the results, as discussed in Contemori & Belletti (2010), in the remaining of this article I will present the results combined, without distinguishing between the different conditions.[3] In all cases, the design is such that the child/adult is asked to choose between two options given to him/her, identifying himself/herself with one of the children mentioned in the eliciting story. One example is given below:

(1)     Eliciting story:
        There are two children. The elephant lifts one child, the elephant wets one child. Which child would you rather be? Start with 'I would rather be...'
        Target sentence:
        *Vorrei essere il bambino che l'elefante solleva/bagna.*
        '(I would rather be) the child that the elephant is lifting/wetting.'

In a first running of the experiment, 48 Italian-speaking children aged 3;4-6;5 were tested (for further details, see Belletti & Contemori, 2010). In a second running 100 children were tested, including older children with ages ranging from 3;4 to 8;10 (for further details, see Contemori & Belletti, 2010).[4] Twenty-eight adults (aged 18-28) were also tested. In all cases, the difficulty with the production of ORs clearly emerged in contrast with the smooth production of SRs.
    An interesting, and at first sight surprising, developmental path emerges when considering the reversed U-curve in Figure 1, illustrating

the young children's production of ORs in the first running of the
experiment (Belletti & Contemori, 2010):

Figure 1: The development of young children's production of ORs
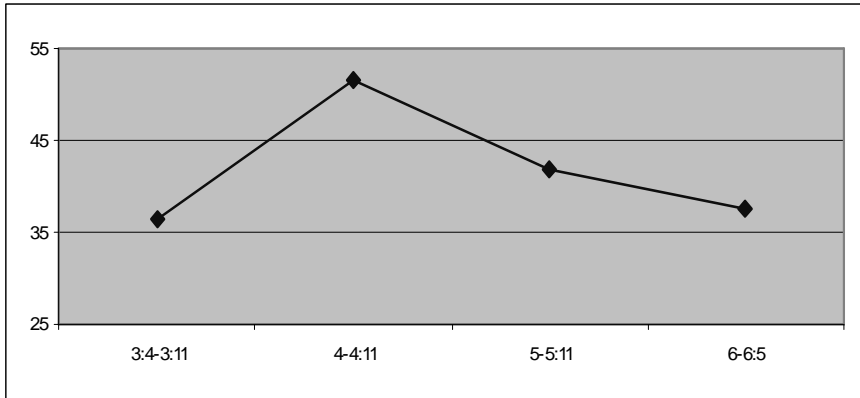


Figure 1 is surprising for two reasons: first, because it shows that there is
so to speak a negative development, as children's ability to produce ORs
first increases, but then at age 5 it decreases and goes further down at age
6. Second, because it shows that young children do actually produce some
ORs. The comparison between adults and children offered in Tables 1 and
2, adapted and rearranged from Contemori & Belletti (2010), is also
revealing and sheds further light on the significance of Figure 1. The
comparison between Tables 1 and 2 indicates that whereas the ratio in the
production of SRs vs. ORs is (a little more than) 2 to 1 in children, it is
dramatically different in adults, where it amounts to 10 to 1.

**Table 1: SRs and ORs produced by children**

|            | SRs     | ORs     |
|------------|---------|---------|
| 3;4-3:11   | 70%     | 35%     |
| 4-4;11     | 91%     | 51%     |
| 5-5;11     | 86%     | 42%     |
| 6-6;11     | 92%     | 32%     |
| 7-7;11     | 87%     | 62%     |
| 8-8;10     | 95%     | 30%     |
| TOTAL      | **88%** | **39%** |

**Table 2: SRs and ORs produced by adults**

| SRs | ORs |
|-----|-----|
| **99%** | **10%** |

Hence, adults in the very same elicitation conditions in which children produce some ORs, avoid the production of ORs almost completely.

The natural question to ask is: what do children and adults do instead, when an OR is elicited? The experimental results indicate that they do partly different things. As indicated by the results in Table 1, children sometimes actually produce an OR. The produced OR either contains a gap in the merge position of the relative head, or it contains a resumptive (clitic) pronoun co-referent with the relative head, a possible option in colloquial, informal Italian, associated with a slightly substandard flavour.[5] Adults, in contrast, never produce resumptive ORs. Other kinds of productions are also found in children: (1) sometimes they produce a relative clause with a different structure, typically a SR, with an inversion of roles; the SR may also display no role inversion, as children change the verb of the relative clause (possibly choosing a different verb adequate for the situation of the elicited sentence, or else just giving a totally unrelated verb); (2) sometimes they just produce a nontarget structure, as they change the character they identify with, and instead of saying which child they would rather be, they pretend to be the other character present in the eliciting sentence (e.g. 'the elephant' in cases like (1)); (3) sometimes they produce a declarative sentence in place of the elicited relative. All these kinds of 'errors', nontarget productions, have been discussed in the literature and are typically found across languages (see, e.g., the recent data in the crosslinguistic study in Friedmann et al. (2010), mentioned in 3.4, and Friedmann et al. (2009) on Hebrew). They can be considered evidence of the characteristic difficulty that children experience with the production of ORs.

However, it is not the case that the residual 61% of children's productions when an OR is elicited, which can be deduced from Table 1, are all errors of these types. From age 5 onward, children start to produce a SR in place of an OR in such a way that the intended meaning is preserved, and this is obtained by means of a passive. Around this age, children start producing Passive Object Relatives, which constitute the only alternative to the production of an (active) OR adopted by adults. The adults' results are presented in Table 3. Table 4 displays, in a parallel way, the children's productions in the same eliciting conditions.

**Table 3: Adult's ratio of Passive Object Relatives and ORs**

| Passive Object Relatives | ORs (with gap) |
|---|---|
| 88% | 10% |

**Table 4:  Children's ratio of Passive Object Relatives and ORs**

| Passive Object Relatives | ORs (with gap/res) |
|---|---|
| 19% | 39% |

The remaining 2% in the adults' data are just a few nontarget productions. The remaining 42% in the children's data include nontarget productions of the type described above, as well as ambiguous relative clauses, e.g. containing a postverbal singular lexical DP in a relative with a singular head, as in (2):

(2)      … il bambino che abbraccia la mamma
            the boy     that  hugs      the mom

In (2) the postverbal DP can be interpreted either as the postverbal subject of an OR or as the object of a SR. Other ambiguous relative clauses may contain no lexical DP and singular verb in the relative clause, as in (3):

(3)      … il bambino che abbraccia
            the boy      that  hugs

Under the SR interpretation, the subject of the relative clause in (3) corresponds to the relative head, with the verb interpreted intransitively; under the OR interpretation, the relative clause contains a null subject and a gap in the merge position of the relative head.  In the calculations on which Table 4 is based, no ambiguous relative has been included in order to avoid complications which cannot be decided on with certainty. Note that this has quite likely led to an underestimation of the actual production of ORs by the children.[6]

Looking at the children's productions developmentally, a clear tendency emerges: as children grow older, more Passive Object Relatives are produced, and the production of ORs decreases, as is illustrated in Table 5.[7] In Table 5 results on Passive Object Relatives have been collapsed, and no distinction is made on the kind of Passive Object Relatives produced by the children, which can be of different kinds

("causative-type passive" with the verb *fare*: *il bambino che si fa pettinare dalla mamma* 'the child that makes himself comb by the mom'; "copular passive": *il bambino che è pettinato dalla mamma* 'the child that is combed by the mom'; and "reduced passive": *il bambino pettinato dalla mamma* 'the child combed by the mom').

**Table 5: Children's productions of Passive Object Relatives (PORs) and ORs per age**[8]

|               | 3-3;11 | 4-4;11 | 5-5;11 | 6-6;11 | 7-7;11 | 8-8;10 |
|---------------|--------|--------|--------|--------|--------|--------|
| PORs          | -      | 2%     | 11%    | 13%    | 9%     | 44%    |
| ORs (gap/res) | 35%    | 51%    | 42%    | 32%    | 62%    | 30%    |

Hence, the surprising U-curve in Figure 1 corresponding to the young children's productions, which is reproduced in the first part of the upper line of Figure 2 below, can be interpreted as correlating with the emergence of Passive Object Relatives as a developing alternative to the production of (active) ORs:

Figure 2:   Children's development of passive object relatives and ORs
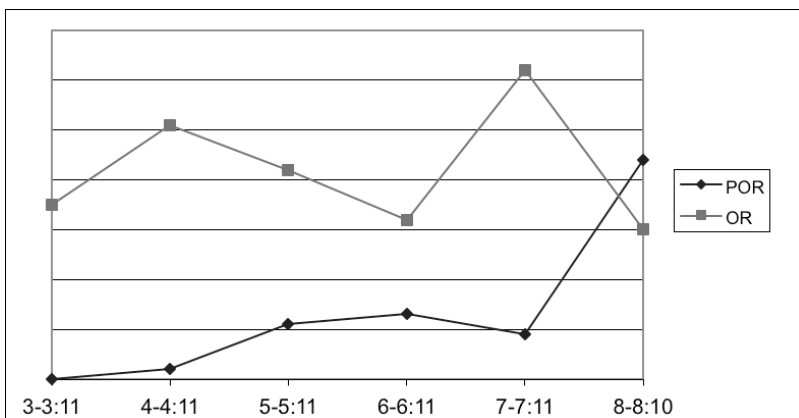


These results suggest that, as children grow older, they tend to approach the adults' performance. Note that the fact that the development is not completely smooth (7 y.o; cfr. Footnote 7) indicates that in these experimental conditions children abandon their attempt to produce (active) ORs relatively late, possibly when passive is robustly acquired and thus

qualifies as somehow the optimal solution to the elicited structure (along the lines presented in 3.2).

### 2.1.1 Passive in relatives with *volere*

A further group of 20 adult speakers of Italian were tested on an adaptation of the same preference task – with 10 SRs and 10 ORs being elicited under the same conditions as in the original test – in which the verb *volere* 'want' was added to the eliciting story. Since *volere* is a verb which does not tolerate passivization very well, as shown in (4), the question arises as to what adults would do in the production of an OR in this condition. Would production of ORs increase?

(4)     a.      Il bambino vuole la palla.
                the kid       wants the ball
        b.      *? La palla è voluta (dal bambino).
                   the ball is wanted by the kid

An example of a story eliciting an OR is given in (5):

(5)     Eliciting story:
        There are two children. The father wants to photograph one child, the father wants to hug one child. Which child would you rather be? Start with 'I would rather be...'
        Target sentence:
        *Vorrei essere il bambino che il papà vuole abbracciare/fotografare*
        '(I would rather be) the child that the father wants to hug/photograph.'

     The results of this version of the experiment are somewhat surprising: in a significant number of cases the verb *volere* was overlooked in the relatives produced by the adults. In particular, 5 out 20 subjects did not produce any *volere* in the relative. As for the remaining 15 subjects, the distribution of the relatives produced according to presence vs. absence of the verb *volere* in the relative clause is summarized in Table 6:[9]

**Table 6: Adult's production of relative clauses according to presence/absence of *volere***

|       | + *volere/riuscire* | - *volere/riuscire* | Total | + *volere* % | - *volere* % |
|-------|---------------------|---------------------|-------|--------------|--------------|
| SRs   | 95                  | 105                 | 200   | 47.5         | 52.5         |
| ORs   | 41                  | 159                 | 200   | 20.5         | 79.5         |

Table 6 indicates that *volere* was widely ignored and consequently omitted by the tested subjects. Somehow, the relatively light contribution of *volere* to the overall meaning of the story must have made it particularly prone to be overlooked by the participants while performing the task of producing the complex relative clause structure. The interesting fact to be noted here, however, is that the same verb *volere* is ignored/omitted almost twice as much in cases in which an OR was elicited than in cases in which a SR was elicited. This also offers a further original measure of the complexity of (active) ORs, which are much harder to compute than SRs. What did adults do when an OR was elicited and they answered without the verb *volere* in the relative clause? They produced Passive Object Relatives in virtually all cases: out of the 159 ORs produced without *volere*, 157 were Passive Object Relatives (2 were nontarget productions). Thus, indirectly, these results further confirm that the production of a Passive Object Relative is much preferred over the production of an (active) OR in the adults' performance, in the eliciting conditions.

## 2.2 The comprehension of passive object relatives

Since Passive Object Relatives appear to be favored in adults' production and also in the production of older children as shown by the results summarized in section 2.1, it seems natural to test whether they are also well comprehended. The test should concern children, under the natural assumption that adults should not have any comprehension problem in this domain, as they do not also have problems in the comprehension of (active) ORs. The children to be tested should be selected in the age range in which one can be reasonably sure that passive is adequately mastered. Hence, a group of 53 children aged between 6;5 and 8;10 was tested through a picture matching task in Contemori & Belletti (2010), on the comprehension of Passive Object Relatives in comparison with the comprehension of (active) ORs. (Active) ORs were tested both with a gap and with a resumptive clitic, since, as mentioned in 2.1, children often adopt (clitic) resumptive relatives in their productions. As also mentioned in 2.1, different kinds of Passive Object Relatives are produced by

children ("causative-type passive", copular and reduced). Thus, all kinds of Passive Object Relatives were tested in the comprehension experiment as well. In total, 60 sentences were tested per child. In Table 7, results on ORs with a gap and with a resumptive clitic on the one hand, and results on the types of Passive Object Relatives on the other, have been collapsed, as the finer distinction is not the focus of the present work (see Contemori & Belletti, 2010 for all relevant details and discussion).

**Table 7: Comprehension of Passive Object Relatives in comparison with (active) ORs**

|                           | 6;5-6:11 | 7-7;11 | 8-8;10 |
|---------------------------|----------|--------|--------|
| ORs                       | 64%      | 67%    | 71%    |
| Passive Object Relatives  | 79%      | 86%    | 93%    |

Figure 3: Children's development in the comprehension of Passive Object Relatives and ORs
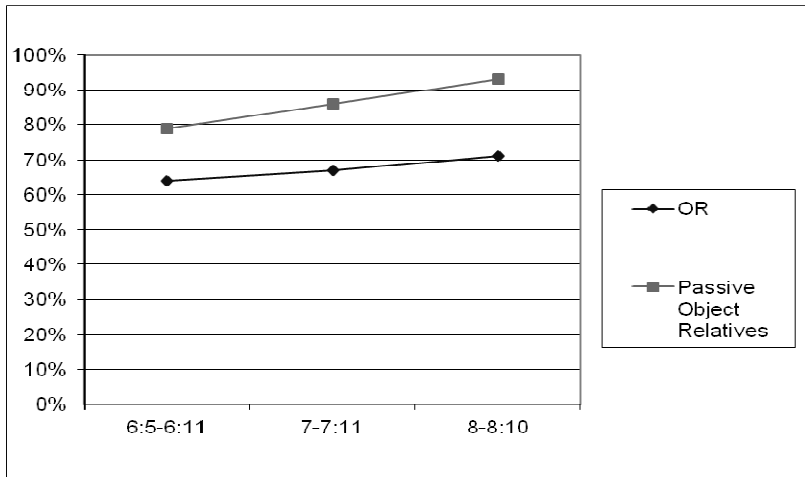


The comprehension results indicate that Passive Object Relatives are better comprehended than (active) ORs, at all ages tested. As analyzed in detail in Contemori & Belletti (2010), whereas development in the comprehension of (active) ORs is relatively mild, there is clearer development in the comprehension of Passive Object Relatives, which is already very good in the first age group and is at ceiling in the oldest group.

## 3. Interpreting and further integrating the results

### 3.1 The processing of ORs. Background assumptions and the characterization of intervention

A featural approach to the syntactic locality principle of Relativized Minimality (RM) (Rizzi, 1990, 2004; Starke, 2001) as developed in Friedmann et al. (2009) constitutes the background against which an interpretation of the results summarized in section 2 will be formulated in this section. A schematic classical formulation of the principle is given in (6):

(6)     Relativized Minimality
        In a configuration X … Z … Y:
        a local relation between X and Y cannot be established if Z intervenes, and Z is a position of the same type as X. (Rizzi, 1990, 2004).
                Same type= sharing relevant features
                For X the target, Z the intervener, Y the origin

In Friedmann et al. (2009) the difficulty displayed by Hebrew speaking children (aged 3;7-5) in their processing of headed ORs with a lexical subject in the relative clause was interpreted as a consequence of the operation of the syntactic locality principle. In these structures, the lexical subject intervenes in the establishment of the dependency between the lexical head of the relative clause and its merge position within the relative clause. This type of account shares some resemblance with other approaches which have also been phrased in terms of intervention (e.g. Gordon et al., 2004; Warren & Gibson, 2002, 2005). However, whereas a crucial attention is generally devoted in these approaches to the determination of the relevant properties which make the subject a disturbing intervener (e.g. its level of referentiality), the account in Friedmann et al. (2009) in terms of RM, rather capitalizes on the nature of the attracting features on the target (X). It is only in those cases in which the (relevant) features on the target are shared with the intervener that the structure may be problematic. Presence of an intervener is not problematic *per se*.

The significantly different behaviour of Hebrew speaking children in the processing of headed ORs vs free ORs across an intervening lexical subject, with the latter being fairly well understood, at a level comparable

to the understanding of SRs, provides strong evidence in support of the approach based on the syntactic locality principle in the described terms.[10] In Friedmann et al. (2009) it is proposed that a feature [NP] is among the attracting features in CP for the derivation of a headed relative clause. The hardest structures to compute for children were precisely those in which both the target (X) and the intervener (Z) contained the [NP] feature (they were both lexically restricted). This is the case of headed ORs across an intervening lexical subject.[11]

In Friedmann et al. (2009) it is further proposed that in the case of headed ORs an inclusion relation is created for the [NP] feature, which is contained both in the target and in the intervener, as schematized in (7):

(7)     Show me the elephant that the lion is wetting  \<the elephant\>
                    +R, +NP          +NP                    +R, +NP
                       X               Z                        Y

It is hypothesized that the inclusion relation is hard for children to process. The capacity to compute the inclusion relation develops at later ages in children; thus, it is conjectured that the difference between adults and children stems precisely from their different capacity in processing inclusion: adults can process the inclusion relation created in headed ORs across an intervening lexical subject, while (young) children cannot.

However, the intrinsic complexity of the inclusion relation could make headed ORs with a lexical subject within the relative clause hard for adults as well, and this would be at the origin of the often observed fact that parsing is slower in ORs of this type.

Given this background of assumptions, we can now move to an interpretation of the main results described in section 2.

## 3.2 A proposal: The optimal way to satisfy locality is eliminating intervention. The case of Passive Object Relatives

Whereas adults and children differ as to their respective abilities to compute the inclusion relation in the feature set specification, disjunction of the relevant feature sets (Starke, 2001) is properly computed by both children and adults, as discussed in Friedmann et al. (2009). It can then be proposed that disjunction in the specification of the relevant feature set can be considered as the optimal way to satisfy the RM grammatical principle, in both comprehension/parsing and production. Disjunction in the specification of the relevant feature set neutralizes intervention; in fact, it amounts to lack of intervention. The ORs tested in the production and

comprehension experiments reported in section 2 were all cases of headed ORs with an intervening lexical subject within the relative clause. Hence, they all fall under the hardest cases for RM. It is then expected that children should have serious difficulties in the processing of these structures.

But why should adults also have difficulties, as witnessed by their extremely low production of headed ORs? The proposal is that the hard structure is in fact avoided by adults as it in principle disallows the optimal satisfaction of RM through disjunction of the relevant feature set. A different way is then preferably selected to optimally eliminate intervention. This way is through the computation of ORs with passive, which yields the production of Passive Object Relatives.

In the spirit of the proposal first outlined in Belletti (in press), based on the pilot results in Utzeri (2007), use of passive can be assumed to be an optimal solution in the attempt to produce an OR, under a derivation of passive which implies movement of a verbal chunk containing the verb (past participle) and the direct object, across the intervening lexical subject, the operation proposed in Collins (2005) that he called *smuggling*. Assuming the *smuggling* operation, passive qualifies as a direct way to eliminate intervention altogether (Belletti, in press; Belletti & Rizzi, 2010). Hence, passive allows for an optimal satisfaction of locality in the relevant sense. Since passive*/smuggling* is known to develop around age 5 - 6 (see also Hyams & Snyder, 2007), children can access the optimal way to eliminate intervention only around this age. The schematic structure in (8) describes the *smuggling* operation moving the verbal chunk containing the verb (past participle) and the direct object, the crucial step whereby intervention of the lexical subject within the vP is eliminated. In (8) it is assumed that the object further moves from the derived position into the relative position in the CP (an expletive *pro* occupies the high subject position in TP).[12]

(8)

[Il bambino [che [$_{TP}$ *pro* è [$_{VP}$ abbracciato <il bambino>   ] da [$_{vP}$ la mamma <VP>]
   +R, +NP                                              +R, +NP              +NP
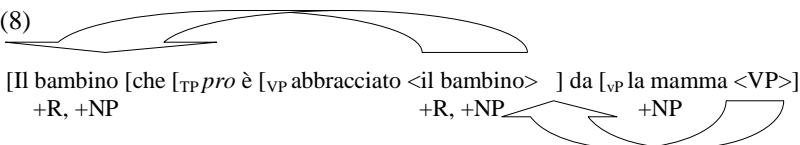
As the strict operation of RM is the optimal operation of the principle, both adults and children tend to adopt it. The adults' behavior in production showing a wide production of Passive Object Relatives, follows from this assumption. Even if adults would have the computational capacity to compute an OR with inclusion of the [NP] feature of the target and the intervener, as indicated by their ability in principle to comprehend (though slowly) this kind of structures, yet, in production, they go for the optimal computation in which inclusion becomes irrelevant, since intervention is structurally altogether eliminated.

For young children the situation is different: since they still cannot productively perform movement of the verbal chunk, hence passive, they are forced to compute a less optimal, more elaborate operation of the locality principle. This is why they end up producing some ORs, more so than adults, at younger ages in exactly the same elicitation situation. However, this is at the limit of their computational capacities: hence their very limited success in the production of (active) ORs, comparable to their limited success in the comprehension of the same structures at the same young ages. Children adhere to the optimal strict version of the locality principle; thus, they try out more elaborate versions of it only when forced by the elicitation situation, with fairly limited success. As soon as the possibility of structurally eliminating intervention develops and they can perform movement of the verbal chunk containing the verb (past participle) and the direct object, i.e *smuggling/*passive, Passive Object Relatives are selectively produced in a way which tends to approach the adult performance.[13]

The account proposed for the (often ample) production of Passive Object Relatives in place of (active) ORs is a genuinely grammatical syntactic account. It could be proposed, instead, that the crucial factor yielding the production of Passive Object Relatives in the eliciting conditions of the described preference task experiment, is ultimately a discourse factor; the same factor which, at the same time, would account for the well-known preference for SRs over ORs in general. It has sometimes been proposed that since the head of a relative clause has a topic value, this would be the main reason why SRs turn out to be better processed than ORs quite generally: since subjects are characteristically endowed with a certain amount of topicality, a subject qualifies as a typically preferred head of the relative clause (Mak et al., 2008). Resort to passive in the production of an object relative clause would then be expected, under these assumptions, as the object relative head could acquire a topic value through passivization. However, that a purely discourse account along these lines cannot be the real reason for

preference of Passive Object Relatives in the preference elicitation experiment discussed here, is indicated by the fact that in the experimental design both the elicited relative head (the child) and the subject of the relative clause, are given in the eliciting story, so that they are equally both discourse topics (cfr. (1) in section 2.1, and (5) in section 2.1.1). A better refined notion would then be needed to draw the right distinction of the relevant level of topicality, leading to preference for SRs and hence Passive Object Relatives, when an OR is elicited in these experimental conditions. Besides, a general notion of topicality necessarily requires further specification in order to distinguish between different kinds and levels of topicality such as those related to subjects (sometimes referred to as "aboutness" (Reinhart, 2006; Rizzi, 2005)) and other topics, including discourse topics. On the basis of these considerations, the hypothesis that the main factor giving rise to use of passive in the production of an OR is primarily structural in nature, expressed in terms of the assumed featural approach to RM, looks indeed superior to a generic discourse account along the lines described above.

### 3.3 The complexity of ORs and Passive Object Relatives

That SRs are easier and hence preferred to ORs is a very generally observed fact, also confirmed by corpus analyses of spontaneous productions in various diverse languages (e.g. French: Hamann & Tuller, 2010, for children and adolescents; Basque, mentioned in Carreiras et al., 2010; English: Rodhe & Gibson, 2003; Italian: Belletti & Chesi, 2011). Such a robust fact should be grounded on a principled reason. The proposed explanation of the experimental results in terms of a locality account along the lines of Friedmann et al. (2009) may offer such a principled reason (see Hamann & Tuller, 2010 for related considerations).[14]

A derivation as the one illustrated in (8) may look complex in terms of the computational steps it involves. However, the proposal is submitted here that this is a case where more is less: if the determining complexity factor with headed ORs across an intervening lexical subject is intervention and the complications it involves for the locality of the computation, the possibility of avoiding, and in fact altogether eliminating intervention as in the case of passive, should anyway be favored, irrespective of the increase in the derivational steps needed (Belletti, in press).

## 3.4 Passive Object Relatives crosslinguistically and in different tasks, in children and adults

In Friedmann et al. (in prep) the same elicitation preference design was adapted to several languages (16, see footnote 12). Twenty children were tested in each of the languages at the same (young) age 5. The results clearly indicate that passive starts being used in the realization of ORs in most of the languages tested, yielding the production of Passive Object Relatives (e.g. particularly in Austrian German, Danish, Dutch, English, European Portuguese, French, German, Italian, and Romanian).[15] Since children were only 5 years old in the crosslinguistic study, it is expected that the appeal to passive may be (sometimes) moderate, as this is the crucial age at which the operations necessary for the computation of passive typically develop in children. In Contemori & Belletti (2010) it is shown that Passive Object Relatives are also produced by children (age range 3;4-8;10) in a different elicitation design (a picture description task adapted from Novogrodsky & Friedmann, 2006; for all details, cfr. reference quoted), and even more so than in the preference task whose main results were presented in section 2. Thus, presence and preference for Passive Object Relatives is clearly not a task related effect, somehow dependent on the setting of the preference task.

The preference for Passive Object Relatives has also been revealed by results of a totally different nature coming from reaction time (RT) experiments with adults in diverse languages such as English and Mandarin Chinese. In a self-paced reading task in English (Rohde & Gibson, 2003), relatives analogous to the Passives Object Relatives discussed in the present work were shown to be read more quickly by adults than (active) ORs (e.g. *The reporter that was attacked by the senator*… vs. *The reporter that the senator attacked*…). Similarly, a self-paced reading task in Mandarin Chinese (Lin & Bever, 2006) testing adults' processing of Relative Clauses in this language, beside confirming the general fact that SRs are parsed more quickly than ORs (also) in Mandarin Chinese, showed that among the various conditions tested in the experiment the passive condition in relative clauses was the one which was read most quickly by adults (e.g. so-called possessor relative clauses with *bei* in the passive construction, compared to relatives with the canonical order and with *ba* anteposition in the relative; see Lin & Bever, 2006 for all relevant details).

Thus, the presence of, and preference for Passive Object Relatives is a very robust fact which is confirmed both crosslinguistically and across

different experimental techniques, as well as both in adults' and children's processing of these structures.

## 4. Ways to modulate intervention and lines of future research

The way in which passive through *smuggling* by movement of a verbal chunk with the verb (past participle) and the direct object avoids intervention is a sort of "surgical" way in which the presence of the disturbing intervening subject is completely eliminated from the computation. The featural approach to RM assumed in this work makes one expect that other ways may modulate intervention. Indeed, featural modifications on the relative head and the intervening lexical subject in such a way that feature mismatch is created between the target (X) and the intervener (Z) have been shown to have precisely an amelioration effect in the processing of complex (active) ORs.

For instance, number mismatch between the lexical relative head and the intervening lexical subject has recently been shown to facilitate children's comprehension of (active) ORs in Italian (discussed in Adani, van der Lely, Forgiarini & Guasti, 2010, age range 5 to 9; see also Volpato, 2010 for similar considerations from hearing impaired children). Gender mismatch between the relative head and the intervening lexical subject has recently been tested in a study comparing Hebrew and Italian in children's comprehension of (active) ORs. Children were of the same age in the two language groups (3;9-5;5.31), and the design was a picture matching task containing exactly the same pictures, with minor adaptations in cases in which the gender of the nouns in the stimuli was different in the two languages (Belletti et al., 2010). The comparative dimension of the study showed that the role of gender mismatch is not the same in the two languages. As discussed in detail in Belletti et al. (2010), only in Hebrew does gender mismatch ameliorate the comprehension of ORs (from 67% to 81%), which almost reaches the level of comprehension of SRs (with both gender match and gender mismatch). In contrast, in Italian the comprehension of ORs does not significantly improve in the gender mismatch condition and remains rather low, as it is in the match condition (57% and 52% respectively). These results indicate that there is no effect of the type of morphosyntactic feature, e.g. gender, *per se*, but that the effect is strictly dependent on the status of that feature in the language. The proposal developed in Belletti et al. (2010) is that gender is a syntactically active feature in the sense relevant for the RM locality principle in Hebrew (i.e. it triggers movement to the subject position), but

not in Italian. Only in Hebrew is gender among the attracting features of the relative head, the target (X). Hence, only in Hebrew is intervention by the lexical subject (Z, the intervener) overcome in the gender mismatch condition.[16] That gender may or may not have an active morphosyntactic status is indicated by the fact that it is expressed in subject agreement verbal morphology in Hebrew, whereas it is not in Italian. Thus, gender is not a feature which may modulate intervention in Italian, despite the fact that Italian expresses gender in several various contexts (determiner-noun, adjective-noun, and past participle). In contrast, number enters into the subject agreement relation in Italian, much as gender does in Hebrew. And indeed, number mismatch has an ameliorating effect in Italian, as discussed in Adani et al. (2010) mentioned above. Only the crosslinguistic comparative perspective is able to reveal that there is no intrinsic role/value of a given morphological feature *per se.*

A natural research program consists in pursuing this line of fine-grained research and checking further features in the perspective of clarifying which ones play a role in modulating intervention, and are thus relevant for RM, and which ones are not (see Grillo, 2008)on a partly similar approach for aphasia). One further feature to be checked may be animacy (Adani et al., 2010; Correa, 1995; Gordon et al., 2001). Ongoing corpus studies on Italian indicate that the vast majority of ORs found in corpora of spontaneous production by Italian adults have an inanimate head (Belletti & Chesi, 2011). Similar results have been found in corpora of spontaneous production by children and adolescents in the study by Hamann & Tuller (2010) on French. The natural question then arises: Does the distinction in the animacy feature between the relative head and the intervening subject have a facilitating effect in the computation of an (active) OR, in particular when the inanimate noun phrase is the relative head? There might then be a correlation with the further following fact that both these studies have found: in corpora of spontaneous production of both Italian and French, few Passive Object Relatives are present of the type produced (widely by adults) in the elicited productions reviewed in section 2, in which both the relative head and the intervening subject were animate. Experimental data on a type of preference task similar to the one presented in section 2 and controlling for animacy were collected in Belletti & Chesi (2011) in order to verify experimentally the role of the animacy feature in combination with the corpus data. The experimental results presented in Belletti & Chesi (2011) indicate that mismatch in animacy does not affect the production of ORs in the elicitation conditions, with Passive Object Relatives remaining the preferably produced option (see Belletti & Chesi, 2011 for detailed discussion and

proposals on the comparison between elicited and spontaneous production). All these studies, which combine different data sources, will ultimately help make more precise the measure of complexity expressible through a featural formulation of RM.

# 5. Conclusion

The robust experimental result discussed in this work, that passive is made use of extensively in the computation of a relative clause as a substitute for an active object relative in tasks of elicited production, has been interpreted as a consequence of the strict operation of the grammatical locality principle of RM. Specifically, it has been proposed that the optimal satisfaction of the principle formulated in featural terms is one where there is disjunction between the target and the intervener in the features relevant  for the principle, in the terms developed in Friedmann et al. (2009). A computation such as passive, whereby intervention of a lexical subject is completely eliminated in the derivation of an OR, qualifies as a way to yield an optimal satisfaction of the RM principle in a situation in which manipulation of the relevant feature sets cannot lead to disjunction, as is the case of (active) ORs; hence, the wide production in the elicitation conditions of Passive Object Relatives by adults, and the developmental tendency to produce Passive Object Relatives by children in the same conditions. Passive Object Relatives were also produced by adults overlooking the presence of the non-passivizable verb *volere* 'want', thus providing a further original measure of the complexity of (active) ORs. Comprehension of Passive Object Relatives has also been found to be higher than that of (active) ORs in (older) children. Together these results confirm the preference for use of passive in the computation of an otherwise (too) complex structure. Although somewhat costly on its own, as indicated by its relatively late appearance in development, passive counts as simpler for both adults and children in the experimental conditions tested. According to the proposed account, this is so since passive with its crucial derivational step moving a chunk of the verb phrase, *smuggling*, allows for a complete elimination of the disturbing intervener, the lexical subject of the relative clause. Hence, passive, through *smuggling*, allows for an optimal satisfaction of the locality RM principle.

It has been proposed that both children and adults tend to adhere to the optimal and strict operation of the principle. Hence, although adults can comprehend (active) ORs, they tend not to produce them, as the production results have clearly indicated. Children start avoiding the