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Relative clauses from the input: syntactic considerations on a corpus-based analysis of Italian

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A well-known classical finding from both acquisition and processing is that (headed) Object Relative Clauses (ORs) are harder than (headed) Subject Relative Clauses (SRs) for children to acquire, and slower for adults to process (Adams 1990, Adani et al. 2010, Brown 1972, de Villiers et al. 1994, De Vincenzi 1991, Gordon et al. 2004, Tavakolian 1981, Warren & Gibson 2002, among many others). In this work, we aim at investigating which typologies of SRs and ORs are present in corpora of standard Italian and the way their frequency compares with some recent experimental findings from elicited production (Belletti 2009, Belletti & Contemori (2010), Contemori & Belletti (this volume)), and with the syntactic account that has been proposed in terms of a featural approach to locality (Friedmann et al. 2009). We also address the issue of the possible role of frequency in conditioning the linguistic performance in the domain of ORs and Passive Object Relatives (PORs).

1. Introduction

In this paper, we discuss the quantitative distribution of Relative Clauses (RCs) occurring in Italian corpora; in particular we evaluate:

1. what kind of RCs are present in child-directed speech and in Standard Italian: Subject Vs. Object Vs. Indirect Object headed RCs (henceforth SRs, ORs and IORs, respectively);

2. how many SRs are in the passive voice, hence they could have been realized as active ORs (following Belletti 2009, we will call such RCs Passive Object Relatives, PORs henceforth);

3. which distribution certain relevant syntactic properties/features have in ORs, specifically:
   a. the position of the subject when it is overtly realized;
   b. the nature of the Subject: Lexical Vs. Pronominal Vs. Null;
   c. the animacy feature associated with the head of the relative clause and with the Subject of the relative clause;

4. Whether there is any difference in the analyzed Italian registers (e.g. Standard Public-Broadcast Television Vs. Child-directed speech).
On the basis of such quantitative analysis, we want to verify whether or not the statistical distribution of the structural configurations considered is somehow predictive, and/or can be considered the cause, of the difficulties we know are related to ORs processing and acquisition. Moreover, we want to verify how the intervention account in terms of a featural approach to the locality principle Relativized Minimality (RM; Rizzi (1990, 2004), Starke (2001)), as developed in Friedmann et al. 2009 is coherent with the observed distribution in the naturalistic corpora investigated. One crucial issue that we address in this work is whether the (un-)frequency of the analyzed syntactic structures (SRs, ORs, PORs) could play a crucial role in determining the speakers’ behavior in the (elicited) production of the complex OR structures. The complement of this question is also naturally raised, whether syntactic complexity may directly condition frequency in the input, such as the frequency of the complex OR structures.

2. Background

Recent experimental results on both production and comprehension of SRs and ORs in Italian (e.g. Adani 2010, Arosio et al. 2009, Belletti & Contemori 2010, Contemori & Garraffa 2010), have confirmed the different status of SRs and ORs in both children and adults, with ORs harder than SRs, in various respects (Adams 1990, Adani et al. 2010, Brown 1972, de Villiers et al. 1994, De Vincenzi 1991, Gordon et al. 2004, Tavakolian 1981, Warren & Gibson 2002, among many others over a long period of time). One crucial finding concerns adults: in an elicited production task (Belletti & Contemori (2010), Contemori & Belletti (this volume)), Italian adults tend not to produce ORs in a very systematic way: specifically, there appears to be an often strong tendency to avoid ORs, in favor of the production of an alternative structure, typically a SR which is able to preserve the same intended meaning. One privileged such alternative is offered by the use of passive, that is utilized up to almost 90% in the different groups of adults investigated in the experiments (see also Belletti 2009 for related findings).

The results have indicated that the production of what we refer to as Passive Object Relatives/PORs, is the preferred option for adults and becomes the preferred option for children as well, as soon as passive becomes productively available to them, around age 5. PORs have also been recently tested in comprehension (Contemori & Belletti this volume), and they have turned out to be significantly better comprehended by the children who master passive, than (active) ORs (with or without resumption; on child resumptive relatives, see Guasti & Cardinaletti 2003). Converging results have been found cross-linguistically in the same production experiment run with children of different languages (Friedmann et al. 2010), and in self-paced reaction time experiments with adults (e.g. Lin & Bever 2006 on Mandarin Chinese).

Our contribution in this paper is to bring into the picture a different kind of empirical data: a pilot corpus study of (headed) SRs and ORs in standard Italian. As a background, we first review the main recent experimental findings mentioned, and the syntactic account that has been proposed in terms of a featural approach to locality/RM (Friedmann et al. 2009). We then move to the novel corpus data and elaborate on their relevance for the assumed locality
approach as well as on their bearing on the issue of the respective role of syntactic complexity in grammar on the one side, and frequency in input on the other (Gennari & Mac Donald 2009, Tomasello 2003).

2.1. Experimental findings in production

In Belletti & Contemori (2010) and Contemori & Belletti (this volume), an adaption has been presented to Italian of a Preference task experiment from Novogrosky & Friedmann (2006) aiming at eliciting the production of SRs and ORs. All relevant details of the design and the task are presented in the references quoted, to which the reader is referred. Here, we give the essential features of the design and of the results obtained. The task consisted in presenting the experimental subjects with a situation in which two children/persons were undergoing a certain event, bearing either the role associated with the subject or the one associated with the object. The experimental subjects were then asked to choose between the two situations, saying which person he/she would rather be. Depending on the different introductory story, the sentence elicited was either a SR or a OR. The experimental subjects were invited to begin each sentence with “I would rather be ...”. The eliciting story was built according to two conditions, a subject/object change condition, in which the subject/object present in the story changed, and a verb change condition, in which what changed was the verb presenting the event of the story. Two examples below give an illustration of the elicitation of a SR and of an OR in the object change and in the verb change condition, respectively (number mismatch conditions between the relative head and the subject of the relative clause were also tested in the references quoted, which are not relevant to the present discussion and will thus be ignored in the illustration, for which only examples from the match condition are presented in (1)):

(1) SR: “There are two children. One child comb the neighbours one child comb the grandparents. Which child would you rather be? Start with ‘‘I would rather be ...’’

Target answer:
“(Vorrei essere il bambino) che pettina i vicini/i nonni”
“(I would rather be) the child that combs the neighbours/grandparents”

OR: “There are two children. The grandpa looks for one child and the grandpa finds one child. Which child would you rather be? Start with ‘‘I would rather be the child ...’’

Target answer:
“(Vorrei essere il bambino) che il nonno cerca/trova
“I would be the child that (the grandpa) looks for/finds”

The task has been adapted to be presented to either children or adults. Overall, 100 children aged 3:4-8:10 have been tested and 28 adults (see Contemori & Belletti, this volume, for the presentation of all details). We report in Table 1 below the results from the adults’ productions (from a first tested group of 18
adults; the subsequent 10 adults have confirmed the same pattern, Contemori & Belletti, this volume):

<table>
<thead>
<tr>
<th></th>
<th># SR</th>
<th>SR %</th>
<th># OR</th>
<th>OR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relatives produced</td>
<td>179/180</td>
<td>99.5%</td>
<td>25/234</td>
<td>10.6%</td>
</tr>
<tr>
<td>“si fa”/causative passive</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Copular passive</td>
<td>-</td>
<td>-</td>
<td>89/234</td>
<td>38%</td>
</tr>
<tr>
<td>Reduced passive</td>
<td>-</td>
<td>-</td>
<td>117/234</td>
<td>50%</td>
</tr>
<tr>
<td>Change of character</td>
<td>-</td>
<td>-</td>
<td>2/234</td>
<td>0.4%</td>
</tr>
<tr>
<td>Change of verb</td>
<td>-</td>
<td>-</td>
<td>1/234</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

Table 1. Summary of the relevant results from the adults’ productions (Contemori & Belletti, this volume).

As Table 1 clearly indicates, the production of (active) ORs is extremely low in adults – around 10% –, highly significantly lower than the ceiling production of SRs. What adults do, overwhelmingly, is to produce PORs in place of (active) ORs – around 90% –. PORs can be either copular or reduced.\(^2\) Adapting from the presentation in Belletti (2010), Figure 1 illustrates the tendency shown by young children in approaching the adults’ type of production, so that as they grow older more PORs are produced in place of (active) ORs, in the same eliciting conditions:

![Figure 1. Summary of the results from the adults’ productions (Contemori & Belletti, this volume).](image)

Contemori & Belletti (this volume) present results from older children, up to age 8:10, showing that the tendency becomes stronger, and the older group, which masters passive well, produces a significantly higher number of PORs in place of ORs, similarly to adults. Furthermore, it is also shown that these results are not a task related effect due to some bias of the Preference task, as totally comparable results are obtained with a different elicitation design (a Picture description task, see the reference quoted for details). In conclusion, the

\(^2\) No “si fa”/causative passive produced by adults, in contrast with the children’s productions; for the interest of this difference in the kind of passives utilized by children and adults, see Contemori & Belletti, under submission)
experimental results on production in Italian have shown a clear and strong preference for the production of PORs when ORs were elicited, in both adults and children, depending on the developmental stage for the latter group.

2.2. Smuggling as a computation which eliminates intervention

These results open up the issue of a comparison of the complexity of different syntactic computations such as passive and (active) object relatives. A promising account has been proposed in terms of locality, specifically in terms of a featural approach to Relativized Minimality, as developed in Starke 2001, Rizzi 2004, which has been adapted to account for development in Friedmann et al. 2009, based on results from comprehension of SRs and ORs in Hebrew speaking children, aged 3:7-5 (see also Grillo 2008, for a related approach to agrammatism). According to the approach in Friedmann et al. (2009), in a structural situation meeting the locality/RM configuration

\[
X \ldots Z \ldots Y \ldots
\]

where \(X\) = the target position – the position of the relative head in CP in the case of relative clauses, \(Z\) = the intervener position – the subject position of the relative clause in the case of ORs, \(Y\) = the origin position – the object position within the relative clause, where the relative head is merged in the case of the ORs

the dependency between the relative head in the target position \(X\) and its merge position \(Y\) within the relative clause, can be hard (sometimes even impossible) to establish for (young) children and may lead to slower processing for adults, if the target head \(X\) in CP and the intervener \(Z\) in the relative clause, share the feature labeled [NP]. The [NP] feature refers to presence of a “lexical restriction” in both the head of the relative clause and the intervening subject, so cases in which they both contain a full lexical noun phrase. Lexically headed ORs with an intervening lexical subject in the relative clause are thus singled out by this system as the hardest structures to compute. According to this system, the crucial property is not that much whether there is an intervener or the distance between \(X\) and \(Y\), but rather whether the Target \(X\) and the Intervener \(Z\) share some computationally relevant feature on the attracting head. The hypothesis is that the feature [NP] is a crucially relevant attracting feature in lexically headed relative clauses. The schematic representation in (2) illustrates the intervention situation created in the OR, in which the [NP] feature of the intervening lexical subject \(Z\) is properly included in the feature set of the Target \(X\) (R in X corresponds to the attracting feature of relative heads):

\[
(2) \text{ il bambino che il nonno cerca/trova } \text{ <il bambino>}
\]

\[
X^{+R+NP} \text{ Z } Y^{+R+NP}
\]

The intervention effect which arises in lexically headed ORs across an intervening lexical subject is the source of the difficulty in the processing of object relative clauses.

As discussed in Belletti 2009, 2010, the use of passive can be seen as an optimal way to overcome the described intervention effect which inevitably arises in the relativization of a direct object across an intervening lexical subject. Assuming a

\[3\] On the difference between children and adults in the ability to compute the inclusion relation, see the discussion in Friedmann et al. (2009), and Belletti et al. (submitted).
derivation of what we call *passive* in the terms developed in Collins 2005, which involves movement of a verbal chunk containing the verb and the object across the intervening lexical subject, whereby intervention is eliminated - the process referred to as *smuggling* in Collins 2005 - a principled reason is provided for the (often overwhelming) appeal to passive in the syntactic computation of an OR in Italian (and also in other languages, as mentioned) that the experimental results have so clearly revealed. The assumed derivation is schematically illustrated in (3) for the Italian POR “il bambino che è pettinato dalla mamma” (the child that is combed by the mom):

(3)

```
CP
   /  \ (il) bambino
     /  \ FTNP
       /  \ che
         /  \ TP
           /  \ pro
             /  \ è
               /  \ TP
                 /  \ VoiceP
                   /  \ VoiceP
                     /  \ VP
                       /  \ pettinato
                         /  \ da
                           /  \ VP
                             /  \ <VP>
                               \  \ la mamma
```

A natural question to ask is: to what extent are PORs also found in naturalistic corpora? In the following section of this study, we address this question.

3. The analysis

3.1 Corpora used

The first kind of production we analyzed is the child-directed speech; to retrieve these productions, we inspected the Italian section of the CHILDES database (8 children, 113 files, plus 1 child, 19 files, whose data have been collected and transcribed at CISCL, Matteini 2011). Then, we compared the distribution of the RCs in these files with the distribution found in two other Italian corpora of adult speech: the Siena University Treebank (henceforth SUT, 29 television news taken from special editions of the national television news, shortened and simplified for on-line translation in Italian Sign Language, Chesi et al. (2008)) and the Italian Television Corpus (Corpus di Italiano Televisiono, henceforth CIT, 7 TV programs such as national editions of talk shows, standard news,
The comprehension and production of clitics in Italian adults with Down Syndrome

In the table below, we report the size of the corpora and their format.

<table>
<thead>
<tr>
<th>Corpus Name</th>
<th>References</th>
<th>Size (in words)</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHILDES</td>
<td>MacWhinney &amp; Snow (1985)</td>
<td>132 files (390,511 words: 115,357 produced by children, 275,154 produced by adults)</td>
<td>chat format</td>
</tr>
<tr>
<td>SUT</td>
<td>Chesi et al. (2008)</td>
<td>29 TGs (17,981 words)</td>
<td>SUT (specific constituency/dependency format, XML)</td>
</tr>
<tr>
<td>CIT</td>
<td>Spina (2005)</td>
<td>7 TV programs (42,668 words)</td>
<td>morphologically tagged text</td>
</tr>
</tbody>
</table>

Table 2. The corpora used for the analysis of RCs

3.2 Methods

Since the corpora were differently structured, we used different tools for retrieving relative clauses in a semi-automatic way: for simple-text encoded corpora (CHILDES) we used Regular Expressions through the GREP tool\(^4\). Regular Expressions are very flexible devices to define ordered sets of characters that correspond to specific morphological units: for instance, Italian SRs and ORs are (in almost all cases, but see the discussion on Reduced RCs in 3.3 and table 7) clearly marked with an invariable relative pronoun/complementizer (i.e. “che”); this can be productively encoded with a simple regular expression like the one in (4) that picks up all occurrences of “che” produced by a certain speaker (“TIER”) in a CHAT-encoded file (MacWhinney et al. 1985):

\[
\text{(4) Regular expressions using “grep”:
}\]

\[
\text{grep -i -n -E "TIER:([:space:]:)([:punct:]:)([:alpha:]):)*[:space:]che[:space:]"}
\]

Even though many occurrences of “che” introduce in fact declarative clauses and not RCs in Italian\(^5\), this approach allows us to restrict the set of data to be manually inspected and it offers a precise way of counting linguistic phenomena. For instance, rather subtle regular expressions can be written for isolating past participles looking at the relevant morphological inflection; this allows one to restrict the set of data to be inspected for counting those past participles that can be Reduced RCs; the fact that such expressions isolate a certain number of verbs is a fact that can be precisely replicated.

---

\(^4\) GREP is a Unix native Regular Expression interpreter that has been ported under many platforms; it is easy to use, free, reliable and fast; Given a Regular Expression it returns the line in the text where a matching occurs.

\(^5\) The percentage of RCs with respect to all the occurrences of “che” ranges from a modest 12% in the adults section of CHILDES, to 83% in SUT.
On the other hand, with tagged corpora we can use a more precise counting system that relies on POS tags and on syntactic nodes annotation\(^6\): TGrep (Rohde 2004) is an extension of the Regular Expression Interpreter that allow us to search for specific syntactic patterns in a tagged corpus. For instance a non-reduced RC can be simply isolated using the pattern in (5).a, whereas an OR with the relative head and the subject of the relative both marked with the +animate feature can be retrieved with the expression in (5).b:

\[
\begin{align*}
(5) & \quad \text{a. } \text{tgrep } \text{`NP.rel < C.rel`} \\
& \quad \text{b. } \text{tgrep } \text{`NP.rel-obj.anim, NP-subj.anim`} \\
\end{align*}
\]

3.3. Rough summary of the data collected

In this section, we present the main results of our quantitative analysis. In the tables below, we split the CHILDES corpus in the adult section (CHI A) and in the children section (CHI C).

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Tool used</th>
<th># of analized words</th>
<th># of “che” (%)</th>
<th># of RCs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI A</td>
<td>Keyword [che]</td>
<td>275.154</td>
<td>5.580 (2.03)</td>
<td>677 (0.25)</td>
</tr>
<tr>
<td>CHI C</td>
<td>Keyword [che]</td>
<td>115.357</td>
<td>747 (0.65)</td>
<td>94 (0.08)</td>
</tr>
<tr>
<td>CIT</td>
<td>Tag [POS=&quot;pro:rela&quot;]</td>
<td>42.668</td>
<td>1027 (2.4)</td>
<td>477 (1.1)</td>
</tr>
<tr>
<td>SUT</td>
<td>Tag [C.rel.pro]</td>
<td>17.981</td>
<td>210 (1.17)</td>
<td>174 (0.9)</td>
</tr>
</tbody>
</table>

**Table 3.** The frequency of the keyword “che” in all corpora compared to the frequency in which they correctly isolate RCs.

As mentioned, the table above shows that there is a substantial variability with respect to the “che” usage across corpora (as “che” can be either a declarative clause complementizer or a RC complementizer).

In table 4 the count of RCs with respect to their macro-typology is presented: SRs vs. ORs vs. IORs.

<table>
<thead>
<tr>
<th>Corpus</th>
<th># of Rs</th>
<th># SRs (%)</th>
<th># ORs (%)</th>
<th># IORs (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT</td>
<td>477</td>
<td>314 (66%)</td>
<td>117 (25%)</td>
<td>46 (9%)</td>
</tr>
<tr>
<td>CHI A</td>
<td>677</td>
<td>441 (65%)</td>
<td>228 (34%)</td>
<td>8 (1%)</td>
</tr>
<tr>
<td>SUT</td>
<td>174</td>
<td>162 (93%)</td>
<td>12 (7%)</td>
<td>-</td>
</tr>
<tr>
<td>CHI C</td>
<td>94</td>
<td>83 (88%)</td>
<td>11 (11%)</td>
<td>-</td>
</tr>
</tbody>
</table>

**Table 4.** RC macro-classes.

As expected, the number of SRs is significantly higher than the number of ORs. IORs are the less frequent type of RCs. While CIT and CHI A show comparable ratios SRs/ORs (SRs are

---

\(^6\) Part-Of-Speech (POS) tags are morphosyntactic classes associated to the words in an annotated corpus (e.g. “(D-MS il)” indicates that “il” is a Determiner, Masculine, Singular); the syntactic annotation includes features related to the thematic dependency (e.g. “(VP (NP-subj (D-MS il) (NN-MS cane)) (V-IP3S abbaia))”. The standard annotation (PENN-TREEBANK-II) has been expanded in order to include the relevant features under analysis (e.g. animacy: “(NP-subj-anim … )”; on animacy see below).
roughly twice more frequent than ORs\(^7\)), this is highly contrasting with respect to the ratio we found in SUT and CHIC. While the CHIC count is expected, as in the CHILDES database children are registered up to age 3:4 (table 5), and the production of ORs (and relatives in general) is poorly attested at this young age, the SUT frequency seems to interestingly reveal that the “naïve” intuition behind the notion of “simplified Italian suitable for on-line translation” toward LIS leads to avoid ORs.

<table>
<thead>
<tr>
<th>Corpus</th>
<th>Camilla</th>
<th>Diana</th>
<th>Guglielmo</th>
<th>Marco</th>
<th>Martina</th>
<th>Raffaella</th>
<th>Rosa</th>
<th>Sabrina</th>
<th>Viola</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:5</td>
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<td>1:7</td>
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<td>5 - 0</td>
<td>1 - 0</td>
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<td>0 - 1</td>
<td></td>
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<tr>
<td>2:8</td>
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<td></td>
</tr>
<tr>
<td>2:9</td>
<td>1 - 4</td>
<td>2 - 0</td>
<td>1 - 1</td>
<td>1 - 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2:10</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2:11</td>
<td>3 - 2</td>
<td>5 - 0</td>
<td>10 - 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:1</td>
<td>1 - 0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3:2</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>3:3</td>
<td></td>
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<td></td>
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<tr>
<td>3:4</td>
<td>6 – 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3:5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. RC macro-classes in CHIC: gray cells corresponds to the files present in CHILDES; the two numbers in the cells (n - m) represent the number of SRs - ORs.

To answer the main question of this study, whether and to what extent PORs are present in spontaneous production, we split the SR typology in active (labeled SRs) and passive voiced SRs (i.e. PORs). The result of this is reported in table 6:

\(^7\)The general ratio between SRs and ORs seem to be steady cross-linguistically (see the values presented for very diverse languages such as e.g. Hamann & Tuller 2010 on French, Carreiras et al. 2010 on Basque).
Table 6. RC macro-classes with SRs split in active (SRs) and passive (PORs) SRs.

This table shows that the presence of full PORs is almost unattested across all corpora. This is in striking contrast with the experimental results of elicited production described in section 2.1 (Belletti & Contemori 2010, Contemori & Belletti this volume).

Including in the counting also all possible reduced PORs (e.g. “the boy chased (by the policemen)”\(^8\)) the situation does not change significantly, (with the exception of the SUT data):

Table 7. RC macro-classes with SRs split in active (SRs) and passive (PORs, full + reduced) SRs. (PORs in CHI C cannot be safely quantified since the reduced forms used are probably simple adjectival modifications, whence the question mark).

PORs are mostly realized in a reduced format in all corpora; in CIT and in CHI A they are less frequent than ORs; in SUT, PORs turn out to be more frequent than ORs if reduced ones are included.\(^9\) Children do produce some pseudo-reduced PORs (e.g. “mamma io ho le mani occupate”/lit: I have the hands occupied, Camilla 3;4.9), but since passive is unattested in simple declaratives at this stage in the same corpora, we concluded that these utterances are instances of adjectival modifications.

In the end, we looked closer at the typology and position of the subject in the attested ORs: in particular we considered in how many ORs the subject was lexical or null and, in the first case, with which frequency it appeared pre- or post-verbally:

\(^8\) Both long, with the by-phrase, and short, without by-phrase reduced relatives are included.

\(^9\) We do not have any precise hypothesis to offer as to why PORs including reduced ones should more numerous than ORs in SUT; we speculate that this fact may correlate with the high presence of reduced PORs in the elicited production by adults (Tables 11-12 and the surrounding discussion), which may be considered the optimal solution to the production of an ORs, under the eliciting conditions. Since the simplified Italian of SUT involves a “planned” simplification (see § 5), choice of the optimal solution in SUT may not be surprising.
Table 8. Subject typology and distribution in ORs (“pro V” = null subject; “S V” = pre-verbal lexical subject; “V S” post-verbal lexical subject).

<table>
<thead>
<tr>
<th>Corpus</th>
<th># of ORs</th>
<th># pro V (%)</th>
<th># S V (%)</th>
<th># V S (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIT</td>
<td>117</td>
<td>72 (61%)</td>
<td>19 (25%)</td>
<td>10 (13%)</td>
</tr>
<tr>
<td>CHI A</td>
<td>228</td>
<td>139 (61%)</td>
<td>10 (4%)</td>
<td>80 (35%)</td>
</tr>
<tr>
<td>SUT</td>
<td>12</td>
<td>5 (42%)</td>
<td>3 (25%)</td>
<td>4 (33%)</td>
</tr>
<tr>
<td>CHI C</td>
<td>11</td>
<td>2 (8%)</td>
<td>-</td>
<td>9 (82%)</td>
</tr>
</tbody>
</table>

Whereas the preference for having an empty subject is clearly present in the CIT, in the CHI A, and, marginally, also in the SUT, a less straightforward tendency can be drawn from the pre-/post-verbal opposition: in this sense, both children (CHI C) and child directed speech seem to prefer the post-verbal (often pronominal) solutions, while the CIT shows a slight tendency in favoring the preverbal lexical alternative.

3.4. Discussion 1

Given the frequency distributions presented in the previous section, the question raised in 2.2 has the following answer: PORs are not a frequent structure in the naturalistic input. Since PORs have turned out to be the most frequently produced structure in the elicited productions summarized in section 2.1, for both children and adults, the conclusion must then be drawn that, despite their poor frequency in spontaneous speech, the linguistic performances revealed by the experimental results do not simply reflect the shape of the linguistic input. Hence, we conclude that PORs, which are the preferred structures in the elicited productions, must be preferred on different grounds than as a simple and straightforward consequence of a frequency effect. We submit the proposal that the preference for PORs in elicited production is a consequence of the optimal way to eliminate intervention that use of passive in ORs offers, as illustrated in 2.2. We delay until section 5 a possible hypothesis on the origin of the tension which has emerged between the results from elicited production on the one side and the new results from the naturalistic performance on the other, revealed by the corpus analysis. We now make some considerations on a related aspect of the issue concerning frequency in the input, and point out that the significance of what is or is not (in the domain of relative clauses) most frequently present in the analyzed corpora, must be treated with caution.

Looking at the distribution of relatives in the corpora, the SRs vs. ORs asymmetry could directly fit with the hypothesis that SRs are the most frequent type of relative clause since they involve a less complex syntactic derivation, than the one of ORs, which, in the case of headed ORs with a preverbal lexical subject in particular, typically gives rise to the intervention effect discussed in 2.2. Hence, one could interpret the more frequent presence of SRs in corpora as a consequence of their less complex derivation compared to ORs. In fact, the picture is less straightforward and more articulated; if we reconsider the frequency of SRs and ORs with respect to the verb classes and their subcategorization frame, we observe that the SRs/ORs asymmetry is not there:
Table 9. SRs and ORs distribution across verb subcategorization classes (CHI A corpus).

<table>
<thead>
<tr>
<th>Verb class</th>
<th># SR</th>
<th># OR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unacc.+Unerg.+be</td>
<td>231</td>
<td>0</td>
</tr>
<tr>
<td>Transitive</td>
<td>161</td>
<td>193</td>
</tr>
<tr>
<td>Di-transitive</td>
<td>22</td>
<td>35</td>
</tr>
</tbody>
</table>

In the relevant cases, i.e. with transitive verbs (and di-transitives), the difference between the number of SRs and ORs is not significant ($t = 1.5934$, df = 41.355, p-value = 0.1187). Adult speakers who have the computational capacity to process the complex OR structure, do so in spontaneous production to an extent which is comparable to the production of SRs with transitive verbs; in the analyzed corpora they have produced even more ORs than SRs in absolute numbers. Hence, bare frequency does not directly reflect the complexity of a given structure.

In conclusion, what frequency in corpora may reveal is not a trivial matter in both directions: i. it is not the case that speakers always tend to produce those structures which are more frequent in corpora, as revealed by the ample presence of PORs in elicited production and their very limited presence in the Italian corpora analyzed; ii. nor is it true that speakers always tend to produce those structures which are computationally less complex, as revealed by the balanced presence in the input of SRs and ORs with transitive verbs. This latter point is also coherent with the experimental results on adults’ elicited production, in which the ample production of PORs witnesses the preferred use of a relatively complex computation (e.g. a computation which needs some time to fully develop in children).

As a last point, we note that the conclusion that bare frequency does not immediately reflect the complexity of certain potentially alternative structures (e.g. SR as POR instead of OR), is also supported by the distribution of the subject within the ORs present in the corpora: as illustrated in table 8, in all corpora the empty subject is the most attested option (61% in the SUT and CHI A). This could be interpreted as a tendency in favoring above chance a null pronominal subject. A null subject allows for a computation in which intervention is less strong, given a feature-based intervention approach, along the lines of Friedmann et al. 2009, as no NP feature is shared by the target and the intervener, in the sense illustrated in 2.2. However, if we look at the null subject rate in declarative sentences, we notice that the percentage of null subjects found in the ORs of the analyzed corpora is lower than the one found in simple declaratives: Lorusso 2003, reported that null subjects appear in 79% of the verbal utterances of adults, in the CHILDES files he analyzed; removing occurrences of null subjects in (I)ORs and (Indirect) Object wh-questions from his count, null subjects occur up to 72% of cases in declarative sentences. Then, again, the preference to use a null subject in ORs cannot be taken to be an indicator of the complexity of the involved syntactic computations under discussion.

The tension which has emerged between the corpus analysis and the results from elicited production opens up a new question: we now want to better investigate why PORs should be rare in spontaneous production and, conversely, why they should be so pervasively present in the elicited production.
Looking for an answer to this question(s), we first checked how frequent the passive voice is throughout the corpora and found that, in fact, it is not so infrequent to justify the low rate of PORs in spontaneous productions. As a first preliminary sample we checked the SUT corpus:

<table>
<thead>
<tr>
<th>Corpus</th>
<th># of verbs</th>
<th># trans (%)</th>
<th># ditrans (%)</th>
<th># pass (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUT</td>
<td>872</td>
<td>645 (74%)</td>
<td>50 (6%)</td>
<td>177 (20%)</td>
</tr>
</tbody>
</table>

Table 10. Passive voice (pass) compared to active verbs (transitive and di-transitive) in SUT.

Then, we controlled for the animacy feature on both the relative head and the subject of the object relative clauses. Here we found an important asymmetry that asked for a deeper investigation: while the experimental design elicited productions in which the relative head (of the ORs) was always animate, in the corpora only 43% of the relative heads were animate (data from CHIA). We then decided to test the elicited production of ORs, manipulating the animacy feature.

4. Testing head animacy

To see if a [– animate] head favors the production of ORs better than a [+ animate] head, we run two experiments that are an adaptation of Belletti & Contemori 2010 design: the subjects were asked to listen to a certain number of minimal pairs of cue sentences and to answer in the most natural and complete way, choosing one of the two situations described. The answer, in most of the cases, resulted to be a RC, as expected.

4.1. Methods

In both experiments we used four conditions that exhausted the logical possibilities to be tested:

1. [+ animate] Head, [+ animate] Subject
2. [+ animate] Head, [– animate] Subject
3. [– animate] Head, [+ animate] Subject
4. [– animate] Head, [– animate] Subject

We first provided the experimental subject with a short context (e.g. “in a park, there are children playing with an apple…”), then we made the subject listening to a minimal pair of cue sentences (e.g. “the children wash the apple”, “the children throw the apple”) and we finally asked to answer a question in the most natural and complete possible way (e.g. “which apple would you eat?”… Target sentence: “I would eat the apple that the children wash/throw”).

All grammatical subjects in the cue sentences were definite, masculine and plurals (this is because we wanted to eliminate a potential ambiguity and discriminate between non target productions of SRs with post-verbal object, and true ORs with a post verbal subject; both options are realized with the very same word order in Italian, but in the latter case we could rely on the verb-subject agreement), all objects were masculine and singular, all the verbs were inflected at present tense.
We used three items per condition (then, in the end, we had 12 experimental items), we balanced the lexical material in terms of frequency and imaginability and we took 28 fillers to separate the experimental items. We semi-automatically created four randomizations such that: every randomization started with an item taken from a different condition, at least two fillers separated two experimental items, no experimental items of the same condition appeared in sequence, the first 4 experimental items in all 4 randomizations exhausted all 4 possible conditions.

We digitally recorded the audio materials (contexts, cues and elicitation sentences) and we created a PowerPoint presentation where, for every slide, the context was first played, then the cues and at the same time the discriminating words were briefly displayed (in case of verbs, the infinitive forms was chosen for not priming a finite RC) on the screen to help the experimental subjects to memorize the two proposed situations; in the end, the question was played and the beginning of the answer was displayed on the bottom of the screen.

![Figure 2](image.png)

**Figure 2.** Experimental screenshot with all components displayed.

The experimental session was preceded by a short warm-up with three items. The only difference between the two experiments was that in the first one we used the "verb change" elicitation condition (i.e. the only thing that distinguished the minimal pair in the cue sentences was the verb used: "the children wash the apple" vs. "the children throw the apple"), whereas in the second experiment we implemented the "subject change" elicitation condition (i.e. the only thing distinguishing the cue sentences was the subject used: "the children wash the apple" vs. "the parents wash the apple"). The lexical material and the randomization were the same (except for the extra verbs/subject added to comply with the different design).

Below, one sample for each experimental animacy condition (cue sentences and elicitation sentences) in both designs:
Table 11. Experiment 1, verb change. 4 conditions.

<table>
<thead>
<tr>
<th>Cond.</th>
<th>RC head</th>
<th>Subj</th>
<th>cue sentence</th>
<th>elicitation sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+anim</td>
<td>+anim</td>
<td>I poliziotti salutano un ragazzo the policemen greet a child</td>
<td>tu quale ragazzo vorresti incontrare? Which child would you rather meet?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I poliziotti rincorrono un ragazzo the policemen chase a child</td>
<td>“vorrei incontrare il ragazzo...” I would rather meet the child...</td>
</tr>
<tr>
<td>2</td>
<td>+anim</td>
<td>–anim</td>
<td>I secchi sbiancano un imbianchino The buckets unbalance a decorator</td>
<td>Tu quale imbianchino vorresti aiutare? Which decorator would you rather help?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I secchi sporcano un imbianchino The buckets dirty a decorator</td>
<td>“vorrei aiutare l’imbianchino...” I would rather help the decorator...</td>
</tr>
<tr>
<td>3</td>
<td>–anim</td>
<td>+anim</td>
<td>I giornalisti scrivono un articolo The journalists write an article</td>
<td>Tu quale articolo vorresti leggere? Which article would you rather read?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I giornalisti copiano un articolo The journalists copy an article</td>
<td>“vorrei leggere l’articolo...” I would rather read the article...</td>
</tr>
<tr>
<td>4</td>
<td>–anim</td>
<td>–anim</td>
<td>I camini riscaldano un appartamento The fireplaces warm an apartment</td>
<td>Tu quale appartamento vorresti scegliere? Which apartment would you rather choose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I termosifoni affumicano un appartamento The heaters smoke an apartment</td>
<td>“vorrei scegliere l’appartamento...” I would rather choose the apartment...</td>
</tr>
</tbody>
</table>

Table 12. Experiment 2, subject change. 4 conditions.

<table>
<thead>
<tr>
<th>Cond.</th>
<th>RC head</th>
<th>Subj</th>
<th>cue sentence</th>
<th>elicitation sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+anim</td>
<td>+anim</td>
<td>I poliziotti rincorrono un ragazzo the policemen chase a child</td>
<td>tu quale ragazzo vorresti incontrare? Which child would you rather meet?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I commercianti rincorrono un ragazzo the shopkeepers chase a child</td>
<td>“vorrei incontrare il ragazzo...” I would rather meet the child...</td>
</tr>
<tr>
<td>2</td>
<td>+anim</td>
<td>–anim</td>
<td>I secchi sporcano un imbianchino The buckets dirty a decorator</td>
<td>Tu quale imbianchino vorresti aiutare? Which decorator would you rather help?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I pennelli sporcano un imbianchino The paintbrushes dirty a decorator</td>
<td>“vorrei aiutare l’imbianchino...” I would rather help the decorator...</td>
</tr>
<tr>
<td>3</td>
<td>–anim</td>
<td>+anim</td>
<td>I giornalisti scrivono un articolo The journalists write an article</td>
<td>Tu quale articolo vorresti leggere? Which article would you rather read?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I pubblicisti scrivono un articolo The publicists write an article</td>
<td>“vorrei leggere l’articolo...” I would rather read the article...</td>
</tr>
<tr>
<td>4</td>
<td>–anim</td>
<td>–anim</td>
<td>I camini riscaldano un appartamento The fireplaces warm an apartment</td>
<td>Tu quale appartamento vorresti scegliere? Which apartment would you rather choose?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I termosifoni affumicano un appartamento The heaters smoke an apartment</td>
<td>“vorrei scegliere l’appartamento...” I would rather choose the apartment...</td>
</tr>
</tbody>
</table>

4.2. Results

We tested 24 subjects with the verb change elicitation condition and 28 subjects with the subject change elicitation condition.

Here we only report the rough results (see Belletti, Chesi, Contemori and Laudanna, in progress, for a detailed analysis) since this is sufficient to answer the relevant question we posed, that is: do [- animate] heads favor the production of a certain amount of ORs?
<table>
<thead>
<tr>
<th>POR all</th>
<th>H+anim S+anim</th>
<th>H+anim S-anim</th>
<th>H-anim S+anim</th>
<th>H-anim S-anim</th>
</tr>
</thead>
<tbody>
<tr>
<td>POR</td>
<td>57 (79%)</td>
<td>60 (83%)</td>
<td>65 (90%)</td>
<td>63 (87%)</td>
</tr>
<tr>
<td>POR r.</td>
<td>11</td>
<td>20</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>POR by</td>
<td>37</td>
<td>37</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>OR</td>
<td>6</td>
<td>1</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>OR by</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>OR all</td>
<td>14 (20%)</td>
<td>4 (6%)</td>
<td>7 (10%)</td>
<td>8 (11%)</td>
</tr>
<tr>
<td>OR VS</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>OR pro</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>ALT</td>
<td>1 (1%)</td>
<td>8 (11%)</td>
<td>0</td>
<td>1 (1%)</td>
</tr>
<tr>
<td>ALT SR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>ALT PP</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 13. Experiment 1 (verb change) results (24 subjects); r. = reduced, by = by-phrase present, VS = post-verbal subject, pro = null subject, ALT SR = SR produced instead of OR, ALT PP = Prepositional Phrase produced instead of OR.

<table>
<thead>
<tr>
<th>POR all</th>
<th>H+anim S+anim</th>
<th>H+anim S-anim</th>
<th>H-anim S+anim</th>
<th>H-anim S-anim</th>
</tr>
</thead>
<tbody>
<tr>
<td>POR</td>
<td>64 (76%)</td>
<td>64 (76%)</td>
<td>50 (60%)</td>
<td>59 (70%)</td>
</tr>
<tr>
<td>POR r.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>POR by</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>OR by</td>
<td>52</td>
<td>52</td>
<td>45</td>
<td>52</td>
</tr>
<tr>
<td>OR all</td>
<td>9 (11%)</td>
<td>3 (4%)</td>
<td>5 (6%)</td>
<td>3 (4%)</td>
</tr>
<tr>
<td>OR VS</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>OR pro</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>ALT</td>
<td>11 (13%)</td>
<td>17 (20%)</td>
<td>29 (34%)</td>
<td>22 (26%)</td>
</tr>
<tr>
<td>ALT SR</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>59</td>
</tr>
<tr>
<td>ALT PP</td>
<td>1</td>
<td>11</td>
<td>29</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 14. Experiment 2 (subject change) results (28 subjects); r. = reduced, by = by-phrase present, VS = post-verbal subject, pro = null subject, ALT SR = SR produced instead of OR, ALT PP = Prepositional Phrase produced instead of OR.

Despite a non negligible tendency to avoid the production of ORs if favor of a (genitive) PP when the subject is animate and the head inanimate (e.g. “the paper of the journalists” instead of “the paper that the journalist write”) in the subject-change experiment, we can easily see that the great majority of experimental subjects clearly keep preferring the POR solution also in the new experiment manipulating the animacy feature in the described conditions (in the great majority of cases, reduced PORs were produced, e.g. “the child chased” in the verb-change design and “the child chased by the policemen” in the subject-change design). The by-phrase is often unrealized in the verb-change experiment, whereas the use of PORs with the by-phrase is the preferred solution in the subject-change experiment (it is significantly more used than the possible equivalent alternative of OR with post-verbal subject).
4.3. Discussion 2

To better visualize the results, we report a histogram with the relative distribution of RCs produced both in the verb-change and in the subject-change experiments (we collapsed together all three items per condition and we removed non-RCs productions):

![Histogram](image)

Table 15. Aggregated results of the elicitation task (H+/– = [+– animate] relative head, S+/– = [+– animate] relative subject)

Here it is clear that the animacy (mis)match does not play any role in favoring or disfavoring the production of (active) ORs, in the adopted experimental conditions. Again, we observe lack of a direct correlation between frequency in the input and the behavior in the elicited production. PORs remain the preferred structure produced also in the new experiments manipulating animacy.

Here we observe that the intervention account proposed in Friedmann et al. 2009, correctly predicts the ranking of the produced relatives in the new experiments: ORs with a preverbal lexical subject, are the least produced ORs in the overall results (only 11 out of 535 relatives produced, Tables 11, 12): these are indeed the structures singled out as those in which intervention is stronger hence the structure harder to compute, as the NP feature of the intervening lexical subject is properly included within the feature set of the target relative lexical head. ORs with a post-verbal subject and ORs with a null pronominal subject are more often produced (Tables 11, 12). Assuming a derivation through smuggling for (active) ORs with a postverbal subject (Belletti & Contemori (2010)), this solution eliminates intervention in a way parallel to PORs; a further complicating factor is however involved in (active) ORs with a postverbal subject, which displays crossing between the dependency of the (expletive) null

---

10 In fact, ORs are slightly more often produced in the [+ animate] head, [+ animate] subject condition, where, if anything, one would have expected a higher intervention effect due to animacy matching, if animacy was a relevant feature in the computation.
subject in the EPP position and the lexical subject in the postverbal position, with the chain relating the relative head and the gap in the object position of the smuggled VP chunk (structure 3 in §5 below). No such crossing is involved in PORs (structure 1 in §5 below). In ORs with a null (pronominal) subject, intervention should be less strong in principle, as no NP feature is contained in the intervening subject; hence, a null (pronominal) subject does not constitute as a strong intervener as a lexical subject (see also Gordon et al. 2004). PORs are by far the best solution: they are the only case in which intervention is totally eliminated, and no further complicating crossing is involved in the computation, as noted. In conclusion, the assumed intervention approach expressed in featural terms, accounts for the preferences revealed by the elicited productions of the new experiments.

5. Final considerations

Our corpus analysis has revealed that adults can process ORs and, in their spontaneous production, they do produce some ORs. This happens to a significantly smaller extent than SRs. These data are coherent with the assumed intervention account, which constitutes the key factor for interpreting the crucial fact that ORs are generally harder to process, also for adults, in various respects. However, we have also pointed out that the higher frequency of SRs in the corpora cannot be linked in a simple minded way to the complexity of the syntactic computation, as SRs and ORs are evenly distributed when the verb of the relative is a transitive verb, thus confirming that ORs can be properly processed by adult speakers and productively used in real communicative situations; hence, they are not just avoided on the basis of a complexity measure. The rareness of PORs in spontaneous productions in turn, may suggest a residual disfavoring of passive over active in naturalistic productions; presumably more so in contexts in which an already articulated computation is processed, such as a relative clause. A conclusion in need of further investigation, which we leave at this speculative stage here.

In contrast, in the elicited production, speakers tend to select the best computation, which is the one where no intervention arises. This explains the clear preference for the passive derivation through smuggling in computing the relativization of a direct object (§2.1), yielding the production of PORs. We suggest that the asymmetry in spontaneous production and in the elicited context plausibly derives from the fact that in the elicited production, but not in the spontaneous production, a (semi-conscious) “planning” of the sentence structure is made possible by the fact that all lexical material (the relative head, the subject and the verb) is provided to the experimental subjects in the introductory story. This allows the speakers to compute the best possible computation which, according to the analysis adopted here, is the one which, eventually, totally eliminates intervention, as is the case in PORs.

The following schematic derivations illustrate the predictions/rankings of the assumed intervention account:
1. PORs:

\[
[D \, NP \quad \rightarrow \quad [D \, p_{\_o} \quad \rightarrow \quad [V \quad \rightarrow \quad b_{\_v} \, DP \quad \leftarrow [V \quad \leftarrow]]]
\]

2. OR with null subject:

\[
[D \, NP \quad \rightarrow \quad [D \, p_{\_o} \quad \rightarrow \quad [V \quad \leftarrow \quad w_{\_v} \quad \leftarrow]]]
\]

3. OR with post-verbal subject through smuggling:

\[
[D \, NP \quad \rightarrow \quad [D \, p_{\_o} \quad \rightarrow \quad [V \quad \rightarrow \quad DP \quad \leftarrow [V \quad \leftarrow]]]
\]

4. OR with pre-verbal subject:

\[
[D \, NP \quad \rightarrow \quad [D \quad \rightarrow \quad [V \quad \leftarrow \quad w_{\_v} \quad \leftarrow]]]
\]

On one extreme -1-, PORs are the best possible solution, given the smuggling analysis à la Collins, since there is no intervention, on the other extreme -4-, ORs with preverbal lexical subject are the worst possible solution, since there is intervention in the strongest form. Intermediate solutions are ORs with a null (pronominal) subject -2-, where no NP/lexical restriction feature is present on the subject (but only on the relative head), and ORs with a post-verbal subject -3-: arguably in the latter structures a lexical subject intervenes to a lesser extent than a preverbal subject as proposed in Guasti et al. (2010) for similar structures in wh interrogatives, following Franck, Lassi, Frauenfelder, & Rizzi (2006). However, as noted in 4.3, although intervention is eliminated through smuggling in 3, the crossing of dependencies that the structure implies makes it less optimal than a POR structure.

References


Hamann, C. and L. Tuller (2010) Relative Clause Production in French Children and Adolescents, University of Oldenburg-Université de Tours (submitted)


The comprehension and production of clitics in Italian adults with Down Syndrome: a pilot study

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This study reports on findings from an experimental investigation into the knowledge of Binding and the production of object clitic pronouns in a group of Italian adolescents with Down syndrome (DS), compared to a group of typically developing (TD) children aged 3:4-5:3, matched to the participants with DS on receptive grammar abilities. Previous studies on English adults with DS found a specific difficulty in comprehending reflexives, but not pronouns (Perovic 2006, Ring & Clahsen 2005).

With a comprehension study testing the interpretation of reflexive clitics and object clitic pronouns, we observe that both Italian participants with DS and TD children, comprehend the two types of clitics equally well. Moreover, no dissociation is found between reflexive and object clitics in any of the conditions in analysis in the two groups.

This results support the hypothesis that reflexive clitics, which are comprehended by Italian adults with DS, are different in nature than reflexive full pronouns, which are impaired in the English population (Kayne 2000, among others).

With a task testing the production of pronominal clitics, we observe that object clitic pronouns are particularly challenging for 3 of the 4 subjects with DS. Overall, the group performance of participants with DS is marginally lower than that of the TD controls. We interpret the difficult that (some) of the DS and TD participants experience with the production of object clitics as the result of the their syntactic complexity, as suggested by Hamman & Belletti (2006).

1. Introduction

In section 1.1 we describe the general language abilities of people with DS and in section 1.2 we discuss previous studies on syntax in DS, in particular on Binding Principles.

In Section 2 we focus on pronominal and reflexive clitics in Italian, presenting studies on TD children and sketching out the theoretical framework adopted in the present paper.

1.1 Language abilities in DS

The language of both children and adults with DS has generally been described as relatively more impaired than other cognitive functions, with production abilities

Moreover, despite a high individual variability (Fabbretti et al. 1997 among others), some components of language seem to be more affected than others. In particular, individuals with DS show morphosyntactic and phonological impairment with relatively spared lexical and pragmatic abilities (Fabbretti et al. 1997, Miller 1992, Fowler 1990).

Some studies describe language abilities in DS as delayed, mirroring the pattern in typical language development, with no obvious signs of deficiency (Fowler 1990, Miller, 1988, Vicari et al. 2000).

More recent studies show that a selective impairment affects some language components of syntax in DS. In this perspective, a new account has been proposed suggesting that the linguistic development of people with DS is not simply delayed and raising the issue of a ‘deviant’ linguistic development (Perovic 2003, 2006, Ring & Clahsen 2005).

In the next section we present some previous findings on syntax in adults with DS, in particular on their mastery of Binding principles (Perovic 2003, 2006, Ring & Clahsen 2005).

1.2 Binding in syntactic theory and DS

Binding Theory (Chomsky 1981) regulates the possible binding relationships between nominal and pronominal expressions within clauses by means of three principles. While Principle A claims that a reflexive pronoun must be bound by a local antecedent, Principle B states that a non-reflexive pronoun cannot be syntactically bound by a local antecedent. Finally, Principle C states that referential expressions must not be bound.

Previous research tested Principle A and B of Binding in monolingual adolescent with DS (Perovic 2003, 2006, Ring & Clahsen 2005, Stathopoulou 2009). An unusual pattern of performance was observed in this population.

In Perovic (2003, 2006) English and Serbo-Croatian individuals with DS tested with a picture matching comprehension task showed difficulties in interpreting reflexive full pronouns with either a referential (1) or a quantified antecedent (2).

(1) The bear, is drying himself,

(2) Each bear, is drying himself,

However, whereas Serbo-Croatian participants had problems interpreting conditions with the full reflexive pronoun *sebe* (3), they did not show the same difficulties with the Serbo-Croatian reflexive clitic *se* (4), when it was bound by either a referential or a quantified antecedent.

(3) Marija, *sebe* vidi u ugledalu
Marija self-Acc sees in mirror
“Marija sees herself in the mirror”
Marko se Cl. shaves
“Marko shaves”

Ring & Claesen (2005) obtained the same results with 8 English adolescents with DS. A similar pattern of interpretation of reflexive pronouns has never been documented with TD children of any age. In some languages like English, instead, children display an opposite pattern, also called Delay of Principle B effect (cfr. Section 2.3).

As in the Serbo-Croatian study (Perovic 2003), recent results from Greek (Stathopoulou 2009) showed that participants with DS do not differ from mental age matched TD participants in the comprehension of the reflexive clitics, either when they are bound by a referential or a quantified antecedent\textsuperscript{11}.

In the next section we present the acquisition of Binding pronominal and reflexive clitics in TD across languages, with a particular focus on Italian.

2. Binding principles, pronominal and reflexive clitic in Italian typically developing children
In section 2.1 we present a review of the literature on the acquisition of Binding principles. In section 2.2 we focus on object clitics and reflexive clitic pronouns in Italian TD children, briefly describing the theoretical framework that we adopt in the present research.

2.1 Acquisition of Binding
Typically developing children are known to have an adult-like interpretation of reflexive pronouns from the age 3, but they have difficulties in comprehending non-reflexive pronouns. Up to the age of 4 they allow pronouns to be locally bound to c-commanding antecedents, accepting ungrammatical sentences such as (5) as grammatical (Chien & Wexler 1990, Guasti 2002, Thornton & Wexler 1999). However, their interpretation is adult-like in contexts where the pronoun is bound with a quantified antecedent, as in (6):

(5) *John\textsubscript{i} washes him\textsubscript{i}

(6) Every man\textsubscript{i} washes him\textsubscript{j}

This phenomenon, known as Delay of Principle B effect (DPBE), has been attested in a variety of languages, such as English (Chien & Wexler 1990, Guasti 2002), Russian (Avrutin & Wexler 1992), Dutch (Philip & Coopmans 1996) and Icelandic (Sigurjónsdóttir & Hyams 1990). Instead, it is absent in Romance languages such as Italian (McKee 1992), Spanish (Baauw, Escobar & Philip 1997) and French (Hamann & Philip 1996).

\textsuperscript{11} With a picture matching task, Stathopoulou (2009) did not observe any dissociation between clitic pronouns and reflexive clitics in the DS participants. Rather, the Greek DS group showed a general less accurate performance in all conditions, especially those displaying a mismatch.
For Italian, McKee (1992) shows that TD children aged 3:7 to 5:5 have a good mastery of both pronominal and anaphoric binding. Furthermore, the author suggests that the absence of the DPBE is related to the fact that weak pronouns like Italian lo are clitics, as the example in (7), unlike English pronouns such as him (8).

(7) Gianni, lo_j lava
    John him-masc-CL washes

(8) *John, him_j washes

Even though the interpretation of sentences with pronominal clitics is adult-like from the early stages of language development, the production of pronominal clitics in Italian TD children is known to be more problematic.

In the next section we are addressing the issue of production of pronominal clitics in Italian children, in particular accusative clitics in comparison to reflexives.

2.2 Acquisition of Object and Reflexive Clitic Pronouns and theoretical accounts

Studies on the acquisition of object clitics in Italian have shown that in the early stages of language development the number of clitics produced is low and their adult-like use is delayed (Guasti 1993/1994). Moreover, even though children tend to place pronominal clitics correctly, optional omission emerge in both elicitation (Shaeffer 2000) and spontaneous speech contexts (Cipriani et al. 1993, Guasti 1993/1994).

The delayed production of pronominal object clitics in TD children sharply contrasts with that of other clitic elements, such as reflexives, which are known to be adult-like from the early stages of development (Shaeffer 2000).

To account for the delayed emergence of object clitic pronouns in the children's speech, we adopt a theoretical approach based on the accusative clitics' structural properties.

Object clitic pronouns in Romance languages have been extensively discussed and several proposals have been made to explain their nature and their behaviour.

We adopt a movement analysis of cliticization, assuming that pronominal clitics are V-related determiners that have their features checked by a verbal head. Moreover, we adopt Belletti (1999)'s account on the syntactic clitic derivation as it provides a uniform analysis of the properties of Romance clitic system.

The theoretical basis of Belletti’s account is constituted by the interaction of Case checking with the checking of verbal inflectional morphology, which determines the movement of the clitic in either proclitic or enclitic position.

To check the accusative Case, the clitic and the DP it heads move from its base position to the Specifier of AgrO. After checking its Case under a Spec/head configuration (Kayne 1989), the clitic can cliticize via head movement to the next position.

---

12 This hypothesis (Rizzi 2000 among others) presumes that a feature checking system could be extended to the internal structure of the nominal system. While in the N-related determiner system N move to D to check its features, the V-related determiners (e.g. clitics) do not take a NP complement and move to find a checker as they cannot have their features checked DP-internally.

13 Following Chomsky (1993) account for functional head, AgrO is the inflectional head that has the function of checking Accusative Case features of DP's moving to their specifiers.
higher head. The clitic, firstly moved as an XP, in the last part of its movement is incorporated to the verbal head (I’, its final landing site) as a X’.

Further evidence for this derivation of clitics is given by Belletti (1999) with examples of past participle agreement in Italian. As shown in (9) and (10), in Italian sentences involving cliticization with a complex verb form Aux+Past participle the past participle agrees in gender and number with the clitic:

(9) Lo ha visto
him-cl-masc-sing has seen-masc-sing
“(He/she) saw him”

(10) Le ha viste
them-cl-fem-plu has seen-fem-plu
“(He/she) saw them”

In Belletti’s account, the behaviour of past participle in (9) and (10) is a clear manifestation that the clitic moved as a DP through the Specifier of the AgrPstPrt.

As in Belletti & Hamann (2006), we assume that syntactic complexity is a crucial factor for the late emergence of object clitics in the production in TD children.

Concerning reflexive clitics, we briefly describe the main approaches proposed to account for their derivation: the base-generation hypothesis (Kayne 1975, 2000), the unaccusatives analysis of reflexive verbs (Grimshaw 1990, Kayne 1988, Marantz 1984, Pesetsky 1995, Sportiche 1998) and the lexicalist approach (Chierchia 1989, Reinhart 1996, Wherli 1986).

First of all, Kayne (1975, 2000) shows that the movement analysis assumed for pronominal clitics cannot be implemented for reflexive clitics. He therefore concludes that reflexive clitics must be base-generated in their overt position.

It has been further observed that reflexive clitic constructions share certain properties of passives and unaccusatives cross-linguistically. This fact has been taken to indicate that reflexive clitics are generated as external arguments, with the internal argument raising to subject position, as in a passive (Kayne 1988, Marantz 1984).

Evidence for this hypothesis is given from French auxiliary selection, as exemplified in the past participle constructions in (11)-(13). In (11) a non-reflexive clitic is followed by the auxiliary avoir and the past participle of the transitive verb. In examples (12) and (13) a reflexive external argument (12) and a passive with a null external argument (13) take the auxiliary être (cf. Kayne 1975).

(11) Jean l’a/*l’est frappé
Jean him-CL has/*is hit
“Jean hit him”

(12) Jean s’est/*s’a frappé
Jean himself-CL is/*has hit
“Jean hit himself”

14 The Agr projection of the Past participle verb, placed lower than the Agr/O in Romance languages as argued by Friedemann & Siloni (1993).
(13) Jean était/*avait frappé ti.
Jean was/*had hit
“Jean was hit”

Further evidence that reflexive clitic constructions share certain properties of passives and unaccusatives is taken from French case. Examples of a transitive verb embedded under a causative are given in (14) and (15). In (14), the object clitic *le* is accusative, and the embedded subject *juge* is marked as a dative, whereas when the embedded clause has a reflexive clitic, as in (15), the reflexive clitic is the external argument, and DP *le juge* is the object, bearing accusative case. If *se* were the object, *le juge* would be the subject, and would have dative case as in (14).

(14) Jean *le* fait reveler au/*le* juge
Jean him-CL made reveal to/*the judge
“Jean made the judge reveal it”

(15) Jean fait *se* reveler le/*au* juge
Jean made himself-CL reveal the/*to judge
“Jean made the judge reveal himself”

Research supporting the analysis of reflexive verbs as unaccusatives and claiming that the internal argument of reflexives is the derived subject has been further developed. Some authors hypothesize that the external argument undergoes a lexical process of absorption (Grimshaw 1990, Marantz 1984), while other research propose that it is present in syntax in the shape of the reflexive clitic (Kayne 1988, Pesetsky 1995, Sportiche 1998). Finally, a lexicalist approach suggests that reflexive clitics, unlike full reflexive pronouns, are elements of the inflectional system to mark lexical reflexivity processes of reduction/absorption of the internal argument of the verb (Chierchia 1989, Reinhart 1996, Wherli 1986).

Regardless of the specific analysis that we take into account, the theories illustrated assume that the reflexive clitic is structurally different than the full pronominal counterpart (such as the English *himself*).

Furthermore, all the approaches mentioned predict an earlier acquisition of the reflexive clitic than the object clitic pronoun. While object clitic pronouns are first generated as XPs and than undergo a syntactic movement to a higher projection belonging to the extended projection of V (Belletti 1999), reflexive clitics involve a less complex syntactic derivation.

On the one hand, the lexicalist approach suggests a derivation of a structure lacking the thematic role absorbed in the lexicon, for which an easier computation than accusative clitics is required.

On the other hand, the inaccusative analysis of reflexive verb predicts that an easier chain is surfacing with reflexive rather than accusative clitics, as no crossing is involved in the former with respect to the latter. Crossing between the subject and the object chain is visible in the pronominal clitic construction in (16) while it is absent in the reflexive clitic construction in (17). This might suggest an explanation the earlier surfacing of reflexive clitics in typical language acquisition.
In the present study we will investigate the competence on reflexive clitics and object clitic pronouns in Italian adolescents with DS. Considering the syntactic status of the Italian reflexive clitic *si*, compared to the reflexive full English pronouns, we want to observe if a selective impairment in the interpretation of reflexives is present in Italian subjects with DS. Furthermore, we want to observe if and to which extent object clitic pronouns are mastered by this population, in comparison to Italian TD children.

In the next section we present the experimental study.

3. The study
The aim of the study is to test comprehension of pronominal and anaphoric clitics and production of object clitic pronouns in Italian adolescents with DS. Subjects with DS are compared to TD controls matched on receptive grammar.

We expect that, according to the results from Serbo-Croatian (Perovic 2003) and Greek (Stathopoulou 2009), participants with DS should not experience particular difficulty in interpreting pronominal and reflexive clitics, when the antecedent is either a referential or a quantified NP.

On the other hand, we don't have specific predictions for the production of object clitics, as this aspect has never been investigated in DS.

However, the general problems with language production and morphosyntax (Fabbretti et al. 1997, Fowler 1990, Miller 1992) and the delay in the acquisition of object clitic pronouns by TD children due to their syntactic complexity (see discussion in section 2.2) suggest that pronominal object clitics might be difficult to produce for subjects with DS.

In section 3.1 we present the group of participants with DS and the control groups. In Section 3.2 we illustrate the coding and in sections 3.3 and 3.4 we describe the comprehension and production tasks, respectively.

3.1 Subjects
Four Italian adolescents with DS aged 16:6 and 20:6 participated in the study. They were recruited in a no-profit association in Perugia and Grosseto (Italy)\(^{15}\). Their clinical records confirmed that they are affected by standard Trisomy 21\(^{16}\). The participants' general language abilities were assessed with a standardized receptive grammar (TCGB) and receptive vocabulary test (PPVT-R). The results of the standard tests are illustrated in Table 1\(^{17}\).

---

\(^{15}\) AIPD Onlus- Associazione Italiana Persone Down, sez. Perugia and Grosseto.

\(^{16}\) Trisomy 21, which is the most common etiological subtype of DS, was diagnosed to the subject by neuropsychologists.

\(^{17}\) IQs were not available for all the participants with DS. Only the medical record of participant 3 (19:6) and participant 4 (19:8) provided this information.
Table 1: Individual results on standard language tests: participants with DS

<table>
<thead>
<tr>
<th>Participant</th>
<th>Sex</th>
<th>CA</th>
<th>TCGB -ES</th>
<th>EA</th>
<th>PPVT-R RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>F</td>
<td>16;6</td>
<td>30.5</td>
<td>3:6-4</td>
<td>67</td>
</tr>
<tr>
<td>Participant 2</td>
<td>F</td>
<td>20;6</td>
<td>21</td>
<td>4-4:6</td>
<td>103</td>
</tr>
<tr>
<td>Participant 3</td>
<td>F</td>
<td>19;6</td>
<td>23</td>
<td>4-4:6</td>
<td>98</td>
</tr>
<tr>
<td>Participant 4</td>
<td>M</td>
<td>19;8</td>
<td>17.5</td>
<td>4:6-5</td>
<td>64</td>
</tr>
</tbody>
</table>

Note: TCGB = Test di Comprensione Grammaticale per Bambini; PPVT-R = Peabody Picture Vocabulary Test-Revised; SS = standard score; RS = Raw Score; EA = equivalent age; ES = error score; C.A. = chronological age in years; S=sex; M=male; F=female

Table 1 shows that the participants with DS have a very poor performance on receptive grammar. Their scores are comparable to those of TD children aged 3;6 - 5.

We matched our group with DS with two control groups. The first control group is composed by five adults (2 young men and 3 young woman) with typical language abilities, aged matched to the DS subjects (17:9-25:8).

Their performance was at ceiling on both production and comprehension tasks, confirming their validity.

The second control group is composed by 6 TD children aged 3:4-5:3, matched to the participants with DS on the base of their receptive grammar scores. TD children were randomly selected in a public school in Siena (Italy). The aim of recruiting a second control group is to provide a control for grammatical abilities.

Table 2 shows the individual scores on standard tests of the TD group. The equivalent age (EA) and standard deviation scores (SD), confirm that children's receptive abilities are within the normal range for both grammar and lexicon.

Participant 3 (19:6): verbal IQ = 45; performance IQ= 64;
Participant 4 (19:8): verbal IQ = 54; performance IQ=71;

The other two participants (participant 2 and participant 1) who have not been tested for IQ score, were nevertheless described by the neuropsychologists as “high functioning” subjects with DS, with a moderate/medium cognitive deficit.

18 As the aim of the study is to examine a specific syntactic ability in DS, we decided to select a group of TD children that matched the group with DS on the base of their general receptive grammatical abilities. Therefore, we took into account the normative age-range corresponding to the DS's performances on TCGB (3:6-5).

19 We considered 2 SD below the mean for age as a cut-off for including TD children in the control group.
Table 2. Individual results on standard language tests: control group

<table>
<thead>
<tr>
<th>TD children</th>
<th>S</th>
<th>CA</th>
<th>TCGB ES</th>
<th>ES-EA</th>
<th>PPVT-R RS</th>
<th>PPVT-R SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F</td>
<td>3:4</td>
<td>27</td>
<td>4:0</td>
<td>57</td>
<td>-0.1</td>
</tr>
<tr>
<td>S</td>
<td>F</td>
<td>4:1</td>
<td>12.5</td>
<td>5:0</td>
<td>90</td>
<td>+1.3</td>
</tr>
<tr>
<td>L</td>
<td>M</td>
<td>4:1</td>
<td>30.5</td>
<td>4:0</td>
<td>56</td>
<td>-0.1</td>
</tr>
<tr>
<td>P</td>
<td>M</td>
<td>4:8</td>
<td>26</td>
<td>4:0-4:6</td>
<td>54</td>
<td>-0.9</td>
</tr>
<tr>
<td>M</td>
<td>M</td>
<td>5:3</td>
<td>23.5</td>
<td>4:6</td>
<td>82</td>
<td>-0.3</td>
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<tr>
<td>G</td>
<td>F</td>
<td>5:0</td>
<td>23</td>
<td>5:0</td>
<td>66</td>
<td>-1.2</td>
</tr>
</tbody>
</table>

Note: TCGB = Test di Comprensione Grammaticale per Bambini; PPVT-R = Peabody Picture Vocabulary Test-Revised; SS = standard score; RS = Raw Score; EA = equivalent age; ES = error score; SD = Standard Deviation; C.A. = chronological age in years; S = sex; M = male; F = female

Table 3 shows the mean scores on receptive grammar (TCGB) and the mean raw score on receptive vocabulary (PPVT-R, RS) of both DS and TD groups.

It is interesting to notice that the two groups have a comparable mean score on receptive grammar (TCGB), while participants with DS are more accurate on receptive lexicon than TD controls.

This result is in line with the widely reported dissociation between grammar and vocabulary in DS's language (Fabbretti et al. 1997, Miller 1992, Fowler 1990).

Table 3. Groups mean results on receptive grammar and vocabulary

<table>
<thead>
<tr>
<th></th>
<th>Mean CA</th>
<th>Mean scores TCGB</th>
<th>PPVT-R RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants with DS</td>
<td>19</td>
<td>23.75</td>
<td>83</td>
</tr>
<tr>
<td>TD controls</td>
<td>4:4</td>
<td>23</td>
<td>67.5</td>
</tr>
</tbody>
</table>

3.2 Coding

The group with DS and the control groups were asked to perform a set of tasks involving comprehension of object and reflexive clitics and production of object clitic pronouns. Participants with DS were tested individually in a quite room in their home. The tests were similarly administered to the TD children in individual sessions in a separate, quiet room in their school.

All the participants’ responses were recorded and transcribed after each session. Unintelligible utterances were discarded.
3.3 The tasks: Comprehension
The comprehension task, whose aim is to tests Principle A and B of Binding, involves the elicitation of yes-no answer accompanying picture stimuli. The subject is asked to judge whether a vocal sentence matches or not with a picture.

32 experimental sentences were included: 16 items test the comprehension of a referential or quantified antecedent and a reflexive clitic *si* (N-RefICl; QP-RefICl); 16 items test the comprehension of a referential or quantified antecedent and an object clitic pronoun (N-ObjCl; QP-ObjCl).

The quantified antecedent conditions are included because in languages where DPBE surfaces, TD children correctly interpret the full pronoun when the antecedent is a quantified NP (see section 3.1).

Half of the items displays a match (M) and half a mismatch (MX) between the picture and the vocal sentence in order to check for yes-bias.

Examples of each of the four conditions are listed in (11)- (14).

15 filler items in mismatch condition are included. Experimental and filler sentences are presented in a random order.

11 Referential antecedent and pronominal clitic (N-ObjCl; M-MX):
Vedi il bambino, il papà *lo* pettina
look at the boy, the dad *him-CL* combs
“Look at the boy, the dad is combing him”

12 Quantified antecedent and pronominal clitic (QP-ObjCl; M-MX):
Vedi i bambini, ogni papà *li* pettina20
look at the boys, every dad *them-CL* comb
“Look at the boys, every dad is combing them”

13 Referential antecedent and reflexive clitic (N-RefICl; M-MX):
Il papà *si* pettina
the dad *himself-CL* combs
“The dad is combing himself”

14 Quantified antecedent and reflexive clitic (QP-RefICl; M-MX):
Ogni papà *si* pettina
every dad *himself-CL* combs
“Every dad is combing himself”

3.4 The tasks: Production
A task adapted from Belletti e Leonini (2004)21 tests the production of direct object clitic pronouns in elicitation context.

The test consists of 19 short video scenes with questions. After watching the scenes the participant is asked to answer to questions whose aim is to elicit direct object clitics and fillers questions. An example of a question eliciting a direct object clitic is given in (15), and the correspondent target answers are given in (16):

20 In this case quantified NP *ogni papà* (masculine singular) differ in terms of number features from the clitic pronoun *li* (masculine plural). Because of the mismatch in number, *ogni papà* is not a good antecedent candidate for the clitic pronoun.

21 The original test was designed to test a group of adult German speakers with Italian as L2.
The scenario shows a woman sitting in chair, reading a book. The woman suddenly closes the book she is holding.

(15) Question:
Che cosa ha fatto la donna con il libro?
What has done the-fem woman with the-masc book
“What did the woman do with the book?”

(16) Target answer:
Lo ha chiuso / Lo chiude
it-CL-masc-sing has closed-masc / it-CL-masc-sing closes
“She closed it”

After the scenarios, the participants listen to a question in which the verb is inflected to the past tense (15), with an auxiliary (have) followed by a past participle.

The expected answer “Lo ha chiuso” in (16) also contains a past tense form, with the cliticization taking place on the auxiliary verb. However, as often observed in the elicited productions, the question may also elicit a present tense form preceded by a clitic pronoun (Lo chiude). Both answers have been counted as correct.

Moreover, when a sentence containing a past tense form is elicited (as in: Lo ha chiuso), the past participle must agree in gender and number with the clitic. In 9/19 cases the past participle expected is masculine singular, in 6/19 feminine singular, in 3 cases masculine plural and in one case feminine plural.

The participants with DS sometimes answer with sentences containing a past participle that does not agree in gender/number with the clitic pronoun, as in the production in (17).

If a clitic pronoun is nevertheless present, the sentence is counted as correct. Further analysis of clitic/past participle agreement in the elicited productions is provided in section 4.2.

(17) Sentence produced:
*Li ha portato via
them-cl-masc-plu has brought-masc-sing away
(She) brought them-CL away (Group with DS: Participant 3)

4. Results
In section 4.1 we present results of comprehension task. Individual and groups results of participants with DS and TD children are compared.

In section 4.2 we show individual and group's results on the elicited production task, both at a quantitative and qualitative level.
4.1 Comprehension
Table 4 illustrates the individual results of participants with DS on each of the four experimental conditions.

<table>
<thead>
<tr>
<th>Table 4. Individual percentages of correct responses: participants with DS</th>
<th>Participant 1</th>
<th>Participant 2</th>
<th>Participant 3</th>
<th>Participant 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Match</td>
<td>100</td>
<td>100</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>N-Ocl-M</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Mismatch</td>
<td>100</td>
<td>100</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>N-Ocl-MX</td>
<td>75</td>
<td>75</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>Match</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>N-Acl-M</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>75</td>
</tr>
<tr>
<td>Mismatch</td>
<td>100</td>
<td>75</td>
<td>75</td>
<td>100</td>
</tr>
<tr>
<td>N-Acl-MX</td>
<td>100</td>
<td>50</td>
<td>75</td>
<td>75</td>
</tr>
</tbody>
</table>

Participants with DS perform at ceiling in most of the conditions, scoring 100% correct responses. In some cases, their performance drops at 75%. Using a binomial distribution, we determined that 75% of correct sentences is significantly above chance level\(^\text{22}\).

In one of the conditions (quantifier-object clitic condition, MX) Participant 3 (19;6) performs at chance, scoring 50% of correct responses.

\(^{22}\) Participant 1, 2, 3 4: \(p=0.99\). The \(p\) values are obtained using a binomial distribution, on the assumption that participants were guessing in a random, unbiased way.
We now compare the DS group performance on comprehension of object clitic vs. anaphoric clitic by means of a Two way Fisher's Exact Test. Comparing the group's scores on object vs anaphoric clitics, the difference is not statistically significant when the antecedent is either a referential or a quantified NP.

We now take into account the comprehension of mismatch vs match conditions. No significant difference emerges between match and mismatch conditions in either reflexive or object clitic pronouns when the antecedent is a referential or a quantified NP.

Table 5 shows the control group performance on each of the experimental conditions.

Table 5. Individual percentages of correct responses: control participants

<table>
<thead>
<tr>
<th>Name-Object clitic</th>
<th>Match</th>
<th>N-Ocl-M</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>75</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mismatch</td>
<td>N-Ocl-MX</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Name-anaphoric clitic</th>
<th>Match</th>
<th>N-Acl-M</th>
<th>100</th>
<th>100</th>
<th>75</th>
<th>100</th>
<th>100</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mismatch</td>
<td>N-Acl-MX</td>
<td>100</td>
<td>100</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QP-Object clitic</th>
<th>Match</th>
<th>QP-Ocl-M</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mismatch</td>
<td>QP-Ocl-MX</td>
<td>50</td>
<td>100</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QP-anaphoric clitic</th>
<th>Match</th>
<th>QP-Acl-M</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mismatch</td>
<td>QP-Acl-MX</td>
<td>100</td>
<td>100</td>
<td>75</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

23 Unless explicitly stated, the statistical analysis is performed by means of a Two way Fisher's Exact Test.

24 The comparison between match and mismatch items is useful to detect the presence of yes bias.
As Table 5 shows, TD children perform at ceiling in most of the cases. In some conditions, they score 75% of correct responses, but their performance is still above chance level\(^{25}\). In 2 of the conditions (N-Ocl-M and QP-Ocl-MX), the participant A (3:4) performs at chance.

We now compare the control group performance on the different conditions. Taking into account the comprehension of object and anaphoric clitics, no significant difference emerges between the comprehension of the two kinds of pronouns, when the antecedent is either referential or quantified.

Furthermore, the performance of the control group does not differ significantly in the match and mismatch with either reflexive or object clitic pronouns when the antecedent is a referential or a quantified NP.

Table 6 sums up the groups' performances and percentages of the experimental and control participants.

**Table 6. Groups' total amount of correct responses in each of the Match (M) and Mismatch (MX) conditions**

<table>
<thead>
<tr>
<th>DS participants %</th>
<th>Control participants (3;4-5;3) %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name-Object clitic</strong></td>
<td></td>
</tr>
<tr>
<td>Match</td>
<td>93.7</td>
</tr>
<tr>
<td>N-Ocl-M</td>
<td></td>
</tr>
<tr>
<td>Mismatch</td>
<td>100</td>
</tr>
<tr>
<td>N-Ocl-MX</td>
<td></td>
</tr>
<tr>
<td><strong>Name-anaphoric clitic</strong></td>
<td></td>
</tr>
<tr>
<td>Match</td>
<td>93.7</td>
</tr>
<tr>
<td>N-Acl-M</td>
<td></td>
</tr>
<tr>
<td>Mismatch</td>
<td>81.2</td>
</tr>
<tr>
<td>N-Acl-MX</td>
<td></td>
</tr>
<tr>
<td><strong>QP-Object clitic</strong></td>
<td></td>
</tr>
<tr>
<td>Match</td>
<td>100</td>
</tr>
<tr>
<td>QP-Ocl-M</td>
<td></td>
</tr>
<tr>
<td>Mismatch</td>
<td>87.5</td>
</tr>
<tr>
<td>QP-Ocl-MX</td>
<td></td>
</tr>
<tr>
<td><strong>QP-anaphoric clitic</strong></td>
<td></td>
</tr>
<tr>
<td>Match</td>
<td>93.7</td>
</tr>
<tr>
<td>QP-Acl-M</td>
<td></td>
</tr>
<tr>
<td>Mismatch</td>
<td>81.2</td>
</tr>
<tr>
<td>QP-Acl-MX</td>
<td></td>
</tr>
</tbody>
</table>

\(^{25}\) L (4;1), G (5;0) p=0.99. The p values are obtained using a binomial distribution, on the assumption that participants were guessing in a random, unbiased way.
We now compare the scores of the two groups. Collapsing the total amount of correct responses given by TD and DS participants, the two groups are comparably accurate in all conditions.

Considering the performance on anaphoric and Object clitics, no significant difference emerges between the two groups when the antecedent is either an NP or a QP.

In the next section we present the results of the elicitation task.

4.2 Production

In table 7, we present the individual results of the group with DS in the elicitation task. Their productions are classified with respect to the number of direct object clitics produced and the other productions attested when a direct object clitic is expected (e.g. omission, full DP, Other clitic, Other production), examples of which are given in (18)-(22).

<table>
<thead>
<tr>
<th>Table 7. Production task: Individual percentages of DS group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant</td>
</tr>
<tr>
<td>1 (16;6)</td>
</tr>
<tr>
<td>Direct object clitic pronoun</td>
</tr>
<tr>
<td>60.4</td>
</tr>
<tr>
<td>Full DP</td>
</tr>
<tr>
<td>15.7</td>
</tr>
<tr>
<td>Omission</td>
</tr>
<tr>
<td>26.3</td>
</tr>
<tr>
<td>Other clitic</td>
</tr>
<tr>
<td>-</td>
</tr>
<tr>
<td>Other production</td>
</tr>
<tr>
<td>10.5</td>
</tr>
</tbody>
</table>

Question: “Che cosa ha fatto la donna all'uomo?”
What has done the-fem woman to the-masc man
Target answer: “Lo ha spinto/lo spinge”
him-cl has pushed-masc/ him-cl pushes
“(She) is pushing him/ (she) pushed him”

(18) **Object clitic** : L’ha spinto
him-cl has pushed-masc
“(She) pushed him”
(Group with DS: participant 4)

(19) **Omission**: Ha spinto
has pushed-masc
“(She) pushed”
(Group with DS: participant 3)

(20) **Full DP**: “ Ha spinto l’uomo”
has pushed-masc the-masc man
“(She) pushed the man”
(Group with DS: participant 1)
(21) **Other clitic:** “Gli ha dato una spinta”
  him-Indirect Object-CL has given a push
  “He pushed”  
  (TD Group: M.(5:3))

(22) **Other production:** Ha fatto una mossa
  (he) has done a move
  “He moved”  
  (TD Group: G.(3:4))

Data in Table 7 clearly shows that the performance of DS subject is not homogeneous within the group. Considering the number of direct object clitics produced, three of the subjects give a correct answer in about 60% of the contexts (Participant 1, Participant 2, Participant 3) and only one participant scores at ceiling level (Participant 4).

In table 8, individual data of the TD children are presented.

**Table 8. Percentages of responses in the production task: TD group**

<table>
<thead>
<tr>
<th></th>
<th>A (3;4)</th>
<th>S (4;1)</th>
<th>L (4;1)</th>
<th>P (4;8)</th>
<th>G (5;0)</th>
<th>M (5;3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct object clitics</td>
<td>57.8</td>
<td>84.2</td>
<td>78.9</td>
<td>89.4</td>
<td>94.7</td>
<td>94.7</td>
</tr>
<tr>
<td>Full DP</td>
<td>10.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Omission</td>
<td>26.3</td>
<td>10.5</td>
<td>10.5</td>
<td>10.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other clitic</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5.2</td>
<td>5.2</td>
</tr>
<tr>
<td>Other production</td>
<td>5.2</td>
<td>5.2</td>
<td>10.5</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 8 shows a clear development in the production of Object clitics in the TD children. While the youngest child (A, 3:4) scores the lowest number of object clitics, the 4 years old children produce a higher amount of clitics and the 5 years old reach over 90% of correct responses.

Table 9 sums up the groups' results on elicited production.

**Table 9. Total Percentages of DS subjects and TD children on elicited production**

<table>
<thead>
<tr>
<th></th>
<th>DS</th>
<th>%</th>
<th>TD children</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct object clitics</td>
<td>54/76</td>
<td>71</td>
<td>95/114</td>
<td>83.3</td>
</tr>
<tr>
<td>Full DP</td>
<td>6/76</td>
<td>7.8</td>
<td>2/114</td>
<td>1.7</td>
</tr>
<tr>
<td>Omission</td>
<td>13/76</td>
<td>17.1</td>
<td>11/114</td>
<td>9.6</td>
</tr>
<tr>
<td>Other clitic</td>
<td>1/76</td>
<td>1.3</td>
<td>2/114</td>
<td>1.7</td>
</tr>
<tr>
<td>Other production</td>
<td>2/76</td>
<td>2.6</td>
<td>4/114</td>
<td>3.5</td>
</tr>
</tbody>
</table>
We now compare the results of the two groups.

Considering the number of object clitic pronouns produced in the expected context, the difference between participants with DS and TD children is approaching significance ($p<.049$).

We now focus on the qualitative analysis of the productions.

When a target sentence is not produced, participants with DS and TD children either produce a full DP or omit the clitic.

When the clitic is omitted, the production might either be a present tense form, as in (23), a verbal form aux+past participle, as in (19) repeated here as (24), or the sole past participle, as in (25). The latter case, with omission of the clitic and the auxiliary verb is attested in both groups (DS: 6 cases; TD: 3 cases).

**Question:** “Che cosa ha fatto la donna all'uomo?”
What has done the-fem woman to the-masc man

**Target answer:** “Lo ha spinto/lo spinge”
him-cl has pushed-masc/ him-cl pushes
“(She) is pushing him/ (she) pushed him”

(23) **Omission of clitic (present tense form):**

- Spinge
- pushes-3-per-sing
- “(She) is pushing”

(TD Group: A.(3:4))

(24) **Omission of clitic (aux+past participle):**

- Ha spinto
- has pushed-masc
- “He pushed”

(Group with DS: Participant 3)

**Question:** Che cosa ha fatto l'uomo con la carta?
What has done the-masc man with the-fem paper
“What did the man do with the paper?”

**Target answer:** La ha buttata/La butta
it-cl-fem-sing has thrown-fem-sing/ it-CL throws
“(He) thrown it away/(He) is throwing it away

(25) **Omission of clitic and auxiliary verb (aux+past participle):**

- Buttata nel cestino
- thrown-fem-sing in the-masc bin-masc
- “(He) thrown in the bin”

(Group with DS: Participant 2)

Moreover, in the DS corpus a case of omission with non-target gender agreement is attested. In the sentence produced by Participant 3, the past participle produced is masculine singular instead of feminine singular, as shown in (26):

**Question:** “Che cosa ha fatto la donna con la finestra?”
What has done the-fem woman with the-fem window-fem
**Target answer:** “La ha aperta”

it-cl-fem-sing has opened-fem-sing

(26) **Omission and non target agreement:**

| Aperto | opened-masc-sing | (Group with DS: Participant 3) |

When object clitics are produced in the elicitation task, both participants with DS and control children use them correctly and no placement errors are found.

In Table 10 we show the amount of Object clitics produced with a present tense or a past tense form (auxiliary and past participle).

**Table 10. Percentages of Object clitics with a present tense or a past tense over the total amount of clitics produced in the elicitation task**

<table>
<thead>
<tr>
<th>Present tense</th>
<th>Participants with DS</th>
<th>TD controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7.5</td>
<td>14.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Past tense (Aux+past participle)</th>
<th>Participants with DS</th>
<th>TD controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>92.5</td>
<td>85.3</td>
</tr>
</tbody>
</table>

We now take into account the agreement on the past participle verb.

In 9/54 cases (compared to 7/81 in the TD’s productions) the participants with DS do not produce the required gender/number agreement on the past participle. In the production in (27), for instance, a masculine singular past participle is produced instead of a feminine singular.

**Question:** “Che cosa ha fatto la donna con la finestra?”

What has done the-fem woman with the-fem window-fem

**Target answer:** “La ha aperta”

it-cl-fem-sing has opened-fem-sing

(27) **Answer:** “L’ha aperto”

them-cl has opened-fem-sing | (Group with DS: Participant 2)

In sentences with non-target agreement on the past participle it is not possible to verify if the clitic agrees with the past participle, due to vowel’s elision.

The only exception is a sentence where a masculine plural Object clitic in its full form reveals a mismatch in number agreement with the past participle. The sentence, presented in (17), is repeated here as (28).

**Sentence produced:**

*L’ha portato via*

them-cl-masc-plu has brought-masc-sing away

(She) brought them-CL away | (Group with DS: Participant 3)

To sum up the production’s results, the difference between the amount of clitics produced by DS and TD participants approaches significance. When the clitic is not
produced, DS and control subjects either omit the clitic pronoun or produce a full DP. Notice that in both groups omission is higher than full DPs.

Taking into consideration the qualitative analysis of the correct responses, in some cases both groups use a non-target form in their answer as in (24), which is likely to be a default unmarked past participle form (the masculine singular). Moreover, in cases of omission of the clitic, the auxiliary verb can also be omitted at a similar rate in both groups.

To conclude, the quantitative/qualitative analysis of the responses shows a similar pattern of production in individuals with DS and TD children matched on receptive grammar abilities.

5. Discussion

5.1 Comprehension

In the comprehension task, the performance of TD participants confirm previous data on Acquisition of Binding in Italian (McKee 1992), as no DPBE is found. Children comprehend conditions with pronominal and reflexive clitics equally well, both when the antecedent is referential or quantified.

The individual performance is always above chance, except for the youngest control participant (A. 3:4) who performs at chance in two of the conditions with a pronominal clitic (match with referential antecedent and mismatch with quantified antecedent). However, this might not be due to particular problems interpreting the object clitic pronoun, as the same TD participant scores at ceiling in the other two conditions involving pronominal clitic (mismatch with referential and match with quantified antecedent).

Similarly, the group with DS comprehend pronominal and reflexive clitic to a comparable extent both when the antecedent is a referential or a quantified NP, and their performance is always above chance level. Only in the quantifier-object clitic condition (MX) participant 3 (19:6) performs at chance. We interpret this as a result of the mismatch condition, rather than a difficulty in interpreting the pronoun per se.

As clearly emerges from the results, participants with DS are more likely to commit an error in the mismatch conditions, compared to the correspondent match conditions. A similar result is observed in the comprehension task described in Stathopoulou (2009) with Greek adults with DS. We argue that the mismatch is more challenging and more prone to errors for our participants with DS, leading in one case to a chance level performance (participant 3, condition QP-Acl-MX).

Finally, participants with DS do not differ significantly from controls matched on receptive grammar.

Considering previous results on DS in English (Perovic 2006, Ring & Clahsen 2005) Serbo-Croatian (Perovic 2003) and Greek (Stathopoulou 2009), we did not expect a quantitative difference in the performance of Italian participants with DS compared to TD children. This prediction seems to be supported by our results.

Therefore, contrary to what has been previously observed in English, we can conclude that the interpretation of reflexives in our Italian participants with DS is not impaired.

Italian participants with DS behave similarly to Greek and Serbo-Croatian DS, and correctly interpret the reflexive clitic pronoun.
Our results do not contradict Perovic (2006) and Ring & Clahsen (2005)'s observation of a poor performance for DS in this particular experimental condition. Rather, they confirm the different nature of full reflexives and reflexive clitics (Kayne 2000).

Another interesting observation emerging from our results with DS is the lack of the DPBE in clitic contexts with both referential and quantified antecedents. The participants with DS, similarly to TD controls, exhibited high correctness scores, indicating their knowledge of the binding requirements in these conditions.

To conclude, our results not only provide an insight into the grammatical knowledge of Binding principles in adults with DS, but also support a structural difference between reflexive clitics and full reflexive pronouns. While the latter are impaired in DS, the former do not raise particular interpretative problems in this population.

The accurate performance on comprehension sharply contrasts with the production performance on object clitic pronouns, in both control and DS participants.

In the next section we are discussing the main results on elicited production.

5.2 Production

Taking into account the TD children's performance, we can observe that, despite the small size of the sample, production data clearly show a development in the production of Object clitics, confirming previous findings on Italian (Guasti 1993/1994, Shaeffer 2000 among others).

The amount of clitic omission is higher in the younger TD child (A.: 26.3%), gradually decreases in the 4 years old (S, L, P: 10.5%) and finally disappears in the older children (G, M: 5:3: 0%), who perform at ceiling in the elicitation task.

In subjects with DS, we also expected to observe a difficulty with production of object clitics.

This is partly confirmed by the results, as participants with DS do not fully master the production of Object clitics in all the expected contexts.

A high range of individual variability emerges within the group, confirming similar observations on general language abilities in DS (Fowler 1990, among others).

Participant 4 of group with DS scores a ceiling level performance on production of object clitics (94.7%), while the other three subjects exhibit a poorer performance (participant 1: 60.4%; participant 2: 63.1%; participant 3: 57.8%).

Furthermore, we observed that when DS participants do not produce clitics, they tend to consistently omit them. (Participant 1: 26.3%; Participant 2: 26.3%; Participant 3: 36.8%). This pattern resembles that of other language impaired populations. For instance, direct object clitics are known to be particularly difficult for Italian-speaking children with Specific Language Impairment (SLI). Various studies

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26 Notice that, beside the ceiling level performance on Object clitic production, the other structures produced by G (5:0) and M (5:3) still involve clitics, but of a different type. They correctly use indirect object clitics changing the target verb required in the task.

27 We remind that for participants with DS the number of Object clitics produced amounts to 71%.

An aged matched control group scored 100% of correct responses in the expected contexts, confirming the validity of the task.
(Bortolini et al. 2002, 2006, among others) found evidence that Italian-speaking children with SLI use direct-object clitics to a lower extent than their MLU controls in obligatory contexts and omissions of the clitic represents the most frequent type of error.

In our subjects with DS object clitics are marginally lower than the control group matched on receptive grammar.

Even though the performances of the two groups do not differ to a high degree, object clitics seem to be quite challenging for 3 of the four subjects with DS.

We interpret the difficulty that 3 participants with DS and younger TD children experience with production of object clitics as a result of their syntactic complexity, as described in the approach of Belletti (1999) and Hamann & Belletti (2006).

6. Conclusions
Results on the comprehension task confirm the absence of DPBE in Italian TD children, as previously observed by McKee (1992).

Furthermore, Italian adolescents with DS who took part into the study show a comprehension of reflexive and object clitics comparable to that of TD children matched for receptive grammatical abilities.

Our results on DS do not contradict previous findings on a selective deficit with the interpretation of full reflexive pronouns in DS (Perovic 2006, Ring & Clahsen 2005) and hence support the hypothesis that reflexive clitics undergo a different syntactic derivation than Reflexive full pronouns (Kayne 2000, among others), which facilitates the Italian-speaking DS individuals’ ability to interpret the reflexive construction.

Results on production show that participant with DS are marginally less accurate than the control group in producing object clitics. Besides, a high variability between the four subjects emerges. When an object clitic is not produced, participants with DS either omit the clitic pronoun of produce a full DP. The former error prevails over the latter, resembling the performance of TD controls.

Future research with a larger group of participants with DS is needed to confirm the observations obtained with our pilot study. Moreover, a further comparison with mental age matched controls could provide insight into the extent to which the mastery of this structure is impaired in Italian subjects with DS.

References
The comprehension and production of clitics in Italian adults with Down Syndrome


Disentangling the mastery of object relatives in children and adults. Evidence from Italian

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We investigate the production of subject (SR) and object (OR) relative clauses in Italian typically developing children and adults. We confirm the well known asymmetry between SR and OR for children, with the former more accurately produced than the latter. Moreover, we attest the production of resumptives and relatives with passive to avoid OR with gap. For adults we observe a clear preference for relative clauses with passive as a strategy to avoid ORs.

With a picture selection task, we also test the comprehension of OR with gap, ORs with resumptive clitic pronouns and relative clauses with (different types) of passive. We show that the comprehension of relatives with passive is significantly better than that of ORs (with either gap or resumptive clitics) in children aged 6:5-8:10. Furthermore, while comprehension of relatives with passive increases with age, no age effect is detected in the comprehension of ORs with gap or resumptive clitics.

We explain the persistent difficulty that children experience with ORs both in production and comprehension as a result of intervention effects, as proposed by Friedmann et al. (2009). Furthermore, we adopt Belletti (2009)'s approach to passive derivation to account for the increasing use and more accurate comprehension of relatives with passive over ORs in children.

1. Introduction
We report here the results from a number of production and comprehension experiments, which we run with both children and adults in Italian. The experiments tested a notoriously difficult domain in syntax: the domain of Object relatives, in comparison with Subject relatives.

It is a well known and widely described fact that ORs are harder than SRs, in various respects, for both children and adults. For children, ORs are both difficult to comprehend and to produce (Adani, 2010; Adani et al., 2010; Arosio et al., 2006, 2009; Belletti 2009, Belletti & Contemori 2010; Contemori & Garraffa 2010, for recent contributions on Italian; Brown 1972; Correa, 1995; de Villiers et al., 1994; Friedmann et al. 2009; Friedmann & Novogrodsky, 2004; Gordon et al., 2004; Håkansson and Hansson, 2000; McKee et al., 1998; Tavakolian, 1981, for some items of a rich and long lasting literature); for adults, ORs are harder, slower to parse (e.g. De Vincenzi 1991, Warren & Gibson 2002, a.o). We report results from children aged 3:4-8:10. Our main aim
in this paper is of a documentary nature: we want to contribute a rich array of newly collected data from Italian in the domain of (headed) ORs, so that the difficulty of the complex syntactic structure can be disentangled in (most of) its various, often interacting, components.

Two main aspects of our results are particularly significant and should be mentioned at the outset. First, the production of (headed) ORs is typically avoided by both adults and children in Italian, in the different experimental conditions utilized; the kinds of ORs which are most avoided are the standard ones, with a gap in the merge position of the relative head and a lexical subject in the preverbal position. ORs with a gap are often replaced by (clitic) resumptive ORs, thus confirming previous findings from spontaneous production (Guasti & Cardinaletti 2003). However, the privileged way to avoid the production of an OR which has emerged, is by replacing it with a different structure, that we will refer to as a Passive Object Relative (Belletti 2009, 2010); both adults and children tend to transform the elicited (active) object relative into a subject relative in the passive: this strategy is adopted overwhelmingly by adults, and children tend to approach the adults’ level of production as they grow older. This result confirms the one from a first pilot study (Utzeri 2007) which used similar elicitation designs, adapted from Novogrodsky and Friedmann (2006). The second significant aspect of our results is a new finding on the comprehension of ORs: the comprehension of Passive Object Relatives of various kinds has been tested for the first time and it has been compared to the comprehension of (active) ORs, both with a gap and with a resumptive (clitic) pronoun. Interestingly, all kinds of Passive Object Relatives tested have been better comprehended than (active) ORs, both with gap and with resumption, by children in the ages (6-8:11), the ages in which they are known to be mature enough to master different passive structures.

2. Study I: Production
The first study in based on data gathered in one experiment carried out in Italian, eliciting subject and object relative clauses.

2.1. Participants
100 Italian-speaking children Italian-speaking children aged 3:4-8:10 participated in the elicited production study. The children came from a public school in Siena and Chianciano Terme, Italy. Children were divided into four age groups. Table 1 shows the number and the age mean of each age group.

28 adults aged 20-30 years old were selected as control participants. The adult group is composed by students randomly selected from the University of Siena.
Table 1. Description of the participants

<table>
<thead>
<tr>
<th>Age groups</th>
<th>N of participants</th>
<th>Age mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>12</td>
<td>3:6</td>
<td>0:3</td>
</tr>
<tr>
<td>4-4.11</td>
<td>14</td>
<td>4:5</td>
<td>0:3</td>
</tr>
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<td>5-5:11</td>
<td>17</td>
<td>5:5</td>
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<td>23</td>
<td>6:3</td>
<td>0:3</td>
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<tr>
<td>7-7:11</td>
<td>12</td>
<td>7:5</td>
<td>0:4</td>
</tr>
<tr>
<td>8-8:10</td>
<td>22</td>
<td>8:5</td>
<td>0:3</td>
</tr>
</tbody>
</table>

2.2. Material
Relative clause production was tested using two Preference production tasks, adapted from Novogrodsky and Friedmann (2006). The two tasks are described in sections 2.2.1, 2.2.2 and 2.2.3.

2.2.1 Singular head/subject singular. First task
In the first task, the experimenter presented two options and asked the participants to choose one. Ten items elicited SRs and ten elicited ORs. The head of the expected SR is singular and the verb (and object DP) of the relative clause is singular. Similarly, when an OR is elicited, the head of the relative is singular and the subject (and verb) of the relative clause is also singular.
Two conditions for SRs are included: an Object and a Verb change condition. In the Object change condition, the child has to choose the object of the action (1) and in the Verb change condition she has to choose the verb expressing the action (2).

(1) Elicitation of a SR: Object change condition
Ci sono due bambini, Un bambino mangia la cioccolata, l’altro bambino mangia il gelato. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. One child is eating chocolate, the other child is eating ice cream. Which child would you rather be? Start with “I would rather be...”
Target sentence: Vorrei essere il bambino che mangia la cioccolata/il gelato “(I would rather be) the child who is eating chocolate/ice cream”

(2) Elicitation of a SR: Verb change condition
Ci sono due bambini. Un bambino trova una palla, l’altro bambino compra una palla. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. One child is finding a ball, the other child is buying a ball. Which child would you rather be? Start with “I would rather be...”
Target sentence: Vorrei essere il bambino che trova/compra una palla
“(I would rather be) the child who is finding/buying a ball”

Similarly, the elicitation of ORs includes a Subject and a Verb Change condition. In the first condition, the child has to choose one of the two characters performing an action and in the second condition, one of the two actions performed by the same character.

(3) Elicitation of an OR: Subject change condition
Ci sono due bambini, il dottore visita un bambino, l'infermiera visita l'altro bambino. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. The doctor is examining one child, the nurse is examining the other child. Which child would you rather be? Start with “I would rather be...
Target sentence: Vorrei essere il bambino che il dottore/l'infermiera visita
“(I would rather be) the child that the doctor/nurse is examining”

(4) Elicitation of an OR: Verb change condition
Ci sono due bambini, l'elefante solleva un bambino e l'elefante bagna l'altro bambino. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. The elephant is lifting one child, the elephant is spraying the other 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/spraying”

2.2.2 The ambiguity issue: Singular head/subject and verb plural
In the first task, the match in number agreement feature between the relative head and the subject (and the agreeing verb) of the relative clause may lead to ambiguity in some cases, with the relative clause interpretable either as a SR or an OR. In Examples (5)-(7), we show the kind of ambiguous relatives produced by the children. In (5), the postverbal noun phrase can be interpreted as the direct object in the SR reading or as the postverbal subject in the OR interpretation. In (6) and (7), the lack of a DP may be interpreted either as a non overt object (SR, (6)) or as a null subject within the relative clause (OR, (7) with a lexical copy of the relative head (7)).

Target sentence: Vorrei essere il bambino che l'elefante solleva/bagna
“(I would rather be) the child that the elephant is lifting/spraying”
Sentence produced:
(5) Che bagna l'elefante

The analysis of children's productions showed that there is no difference between SRs produced by children in the object change condition and those produced in the verb change condition. Similarly, no difference emerges between the subject and verb change condition for ORs. Therefore, in the results section, we will not analyze data classified per condition.
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“(The child) that is spraying the elephant”
(M.F. 5:7)

(6) Quello che bagna
“The one that is spraying”
(A.M. 5:7)

(7) Vorrei essere il bambino che bagna il bambino
“I would rather be the child that is spraying the child”
(M.C. 4:9)

To avoid the issue of ambiguity arising from the match in number agreement feature, six additional items eliciting ORs were added to task 1. The aim of those items was to elicit unambiguous ORs with a plural subject and a plural verb within the relative clause. Three items belong to the Subject change condition (8) and three to the Verb change condition (9):

(8) Elicitation of an OR with singular head and subject (and verb) of the relative plural: Subject change condition
Ci sono due bambini, i vicini pettinano un bambino e i nonni pettinano l’altro bambino. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. The neighbors are combing one child, the grandparents are combing the other child. Which child would you rather be? Start with “I would rather be...”
Target sentence: Vorrei essere il bambino che i vicini/nonni pettinano
“(I would rather be) the child that the neighbors/grandparents are combing”

(9) Elicitation of an OR with singular head and subject (and verb) of the relative plural: Verb change condition
Ci sono due bambini, gli amici cercano un bambino e gli amici trovano l’altro bambino. Quale bambino ti piacerebbe essere? Inizia con: “Vorrei essere il bambino...”
There are two children. The friends are looking for one child, the friends are finding the other child. Which child would you rather be? Start with “I would rather be...”
Target sentence: Vorrei essere il bambino che gli amici cercano/trovano
“(I would rather be) the child that the friends are looking for/are finding”

2.2.3 The ambiguity issue: Plural head /subject singular. Second task
The structure of the second task resembles that of the first one with the other possible mismatch condition avoiding ambiguity implemented, where the relative head is plural and the subject of the relative clause is singular. 10 SRs and 10 ORs where elicited with a plural head and a singular subject (and agreeing verb) within the RC.
Similarly to the previous task, we have two conditions for SR (Object and a Verb change condition) and two conditions for OR (Subject and Verb change condition). An example of the elicitation of SR an OR with Plural head /subject singular is given in (10)-(13).
(10) Elicitation of a SR: Object change condition
Ci sono due gruppi di bambini. Dei bambini mangiano la cioccolata, dei bambini mangiano il gelato. Con quali bambini ti piacerebbe stare? Inizia con: “Vorrei stare con i bambini...”
“There are two groups of children. Some children eat chocolate, the other children eat ice cream. With which children would you rather stay? Start with “I would rather stay with...””
Target sentence: Vorrei stare con i bambini che mangiano la cioccolata/il gelato
“(I would rather stay with) the children who are eating chocolate/ice cream”

(11) Elicitation of a SR: Verb change condition
Ci sono due gruppi di bambini. Dei bambini trovano una palla, dei bambini comprano una palla. Con quali bambini ti piacerebbe stare? Inizia con: “Vorrei stare con i bambini...”
“There are two groups of children. Some find a ball, the other children buy a ball. With which children would you rather stay? Start with “I would rather stay with...””
Target sentence: Vorrei stare con i bambini che trovano/comprano una palla
“(I would rather stay with) the children who are finding/buying a ball”

(12) Elicitation of a OR: Subject change condition
Ci sono due gruppi di bambini. Il vicino pettina i bambini e il nonno pettina gli altri bambini. Con quali bambini ti piacerebbe stare? Inizia con: “Vorrei stare con i bambini...”
There are two groups of children. The neighbor combs some children, the grandpa combs the other children. With which children would you rather stay? Start with “I would rather stay with the children...”
Target sentence: Vorrei stare con i bambini che il vicino/nonno pettina
“(I would rather stay with) the children that the neighbor/grandpa is combing”

(13) Elicitation of a OR: Verb change condition
Ci sono due gruppi di bambini. Il nonno cerca i bambini e il nonno trova gli altri bambini. Con quali bambini ti piacerebbe stare? Inizia con: “Vorrei stare con i bambini...”
“There are two groups of children. The grandpa looks for the children and the grandpa finds the other children. With which children would you rather stay? Start with “I would rather stay with the children...”
Target sentence: (Vorrei stare con i bambini) che il nonno cerca/trova
“(I would rather stay with) the children that the grandpa is looking for/finding”

Results of the three number conditions (Singular head/subject singular, Singular head/subject plural, Plural head/subject singular) will be presented separately. We will sometimes focus on the head plural/subject singular battery
Disentangling the mastery of object relatives in children and adults

only, as it gives clearer results, but we will also present material from the singular head/subject plural battery and use it comparatively.

2.3 Coding
The experiment was administered to children in individual sessions in a separate, quiet room in their school. All the responses of the participants were recorded and transcribed after each session. Non-intelligible utterances were discarded. Sometimes, when the children produced a declarative sentence instead of a relative clause, the experimenter invited the child to describe the situation again, beginning with ‘‘I would rather be /I would rather stay with….’’. If a relative clause was finally produced, that was the response taken into account.

3. Results
In this section we present the main results of the productions tasks. In Section 3.1 and 3.2 we will describe results for SRs and ORs, respectively. In section 3.2.1 we will analyze children's productions when an ORs is expected and in Section 3.2.2 we will describe the type of ORs produced, focusing on resumptive ORs and on the presence/position of the subject within the relative clause (section 3.2.3). Finally, in section 3.2.4 we will discuss the production of passive ORs.

3.1 Subject relative clauses
In Table 2 we present the percentages of responses given when a SR is expected in the Singular head/subject singular and in the Plural head /subject singular tasks, respectively.

<table>
<thead>
<tr>
<th></th>
<th>Singular Head/subject singular</th>
<th>Plural Head/subject singular</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>97/120</td>
<td>80.8</td>
</tr>
<tr>
<td>4-4.11</td>
<td>130/140</td>
<td>92.8</td>
</tr>
<tr>
<td>5-5:11</td>
<td>141/160</td>
<td>88.1</td>
</tr>
<tr>
<td>6-6:11</td>
<td>222/230</td>
<td>96.5</td>
</tr>
<tr>
<td>7-7:11</td>
<td>102/120</td>
<td>85</td>
</tr>
<tr>
<td>8-8:10</td>
<td>184/200</td>
<td>92</td>
</tr>
</tbody>
</table>

Table 2. Total amount of SRs produced by children in the Singular Head/subject singular and Plural Head/subject singular conditions out of the total of relatives expected.
The following sentences are examples of children’s productions of SRs.

**Singular head/subject singular battery:**
Target answer: (Vorrei essere) il bambino che fotografa l'uomo/la donna
‘‘(I would rather be) the child who is photographing a man/woman’’
(14) Il bambino che fotografa un uomo
‘‘The child who is photographing a man’’
(M.C. 5:2)

**Plural Head/subject singular battery:**
Target answer: (Vorrei stare con) i bambini che fotografano l'uomo/la donna
‘‘(I would rather stay with) the children who are photographing a man/woman’’
(15) I bambini che fotografano un uomo
‘‘The children who are photographing a man’’
(B.F. 6:0)

In the next section we will discuss the issue of ambiguity and agreement in ORs. In section 3.2.1 results of elicitation of ORs are presented, and the number of SRs produced by children is compared to that of ORs.

### 3.2 Object relative clauses

As discussed in Belletti & Contemori (2010), ORs are frequently avoided by children in all the three number agreement conditions. Moreover, some ORs involve agreement changes within the relative clause. Children also produce a number of unambiguous ORs.

The ambiguity issue arises in the matching condition of the Singular Head/subject (and verb) singular battery. In this task, part of the relatives produced by the children when an OR is expected are ambiguous relative clauses, that could be interpreted as either ORs or as SRs 29

See examples (5)-(7) of ambiguous relatives produced by the children in the number matching condition, repeated here as (16), (17) and (18).

Target answer: Vorrei essere il bambino che l'elefante solleva/bagna
‘‘(I would rather be) the child that the elephant is lifting/spraying’’

Answers produced:
(16) Che bagna l'elefante
‘‘The (child) that is spraying the elephant’’
(M.F. 5:7)
(17) Quello che bagna

---

29 The percentages of ambiguous RC produced by the children (out of the ORs expected) is the following:
- 3:4-3:11: 43.3%
- 4-4:11: 40%
- 5-5:11: 34.3%
- 6-6:11: 39.5%
- 7-7:11: 36.6%
- 8-8:10: 26%
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“That one that is spraying”
(A.M. 5:7)

(18) Vorrei essere il bambino che bagna il bambino
“I would rather be the child that is spraying the child”
(M.C. 4:9)

As for the production of agreement changes they took place in the Plural Head /subject (and verb) singular condition and in the Singular Head /subject (and verb) plural condition. In these tasks, when an OR is expected children sometimes changed the number agreement on the verb of the relative clause from singular to plural (19)-(20) and from plural to singular (21)-(22). The changes occur in relatives where the subject-DP is either postverbal, as in (19) and (21), or null, as in (20) and (22).

Plural Head /Subject (and verb) Singular: the verb of the RC is changed into plural
Target sentence: “(Vorrei stare con i bambini) che (il nonno/il maestro) fotografa (il nonno/il maestro)”
“(I would rather stay with) the children that (the grandpa/the teacher) is photographing (the grandpa/the teacher)”
(19) Sentence produced: “Coi bambini che fotografano il nonno”
“(With the children that are photographing the grandpa”
(D.P. 3:6)

Target sentence: “(Vorrei stare con i bambini) che (l’elefante) bagna/solleva (l’elefante)”
“(I would rather stay with) the children that (the elephant) is spraying/lifting up (the elephant)”
(20) Sentence produced: “Che bagnano”
“(The children) that are spraying”
(T.V. 3:10)

Singular Head /Subject (and verb) plural: the verb of the RC is changed into singular
Target sentence: “Il bambino che (i genitori) fotografano/disegnano (i genitori)”
“The child that (the parents) are photographing/drawing (the parents)”
(21) Sentence produced: “Quello che disegna i genitori”
“The child that is photographing the parents”
(D.S. 5:1)

(22) Sentence produced: “Che fotografa”
“(The child) That is photographing”
(S.I. 5:2)

There are no verbal agreement changes when the subject is preverbal. The only exception to this tendency is one sentence produced in the whole corpus reproduced in (23). However, in this case a resumptive plural clitic is also present.

30 In Belletti & Contemori (2010), we suggest to interpret (at least part of) the errors in number agreement as the manifestation of agreement attraction from the relative head. In (23) attraction may be induced by the clitic.
**Plural Head / Subject (and verb) Singular: the verb of the RC is changed into plural**

Target sentence: “(Vorrei stare) Con i bambini che il papà/vicino pettina”

“(I would rather stay) with the children that the father/neighbor is combing’

(23) Sentence produced: “Che il papà li pettinano”

“That the father are combing them” (F.D. 4:11)

In the present paper we do not examine ambiguous ORs and ORs with agreement changes, on which we refer to the discussion in Belletti & Contemori (2010). We will focus here exclusively on the unambiguous ORs produced by the children.

First of all, we present the quantitative analysis of the unambiguous responses. Then, we will look at the data from a qualitative point of view, focusing on the types of unambiguous ORs produced by children at different age stages.

### 3.2.1 Quantitative analysis of the structures produced when an OR is expected

In Table 3 we present the total amount of unambiguous ORs produced by children over the number of relatives expected. Data of the three elicitation tasks and age groups are presented separately.

**Table 3. Percentages of unambiguous ORs produced in the three tasks (over the number of ORs expected)**

<table>
<thead>
<tr>
<th></th>
<th>Singular Head/subject singular</th>
<th>Singular Head/subject plural</th>
<th>Plural Head/subject singular</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>3:4-3:11</td>
<td>44/120 36.6</td>
<td>19/72 26.4</td>
<td>47/120 39.2</td>
</tr>
<tr>
<td>4-4.11</td>
<td>66/140 47.1</td>
<td>46/84 54.7</td>
<td>73/140 52.1</td>
</tr>
<tr>
<td>5-5:11</td>
<td>53/160 33.1</td>
<td>43/96 44.7</td>
<td>83/170 48.8</td>
</tr>
<tr>
<td>6-6:11</td>
<td>59/230 25.6</td>
<td>54/138 39.1</td>
<td>151/230 65.6</td>
</tr>
<tr>
<td>7-7:11</td>
<td>48/120 40</td>
<td>49/72 68</td>
<td>97/120 80.8</td>
</tr>
<tr>
<td>8-8:10</td>
<td>44/200 22</td>
<td>48/120 40</td>
<td>68/220 30.9</td>
</tr>
</tbody>
</table>

Unambiguous ORs produced in the the Singular Head/subject singular are ORs with a preverbal subject and a gap (24) and ORs with preverbal subject where the relative head is resumed by either a clitic pronoun (25) or a full lexical copy (26). Moreover, we counted as unambiguous ORs, those where the head of the relative is resumed by a clitic within the relative clause and the subject is post-verbal (27) and those where the head of the relative is resumed by a first person clitic within the relative clause and the subject may be overt (28) or not.

Target Sentence: (Vorrei essere) la bambina che il vicino/papà pettina

“(I would rather be) the girl that the neighbor/father is combing”

Sentence produced:
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(24) OR with preverbal subject and gap: Che il babbo pettina
“(The child) that the father is combing”

(G.G. 5;10)

Target Sentence: Vorrei essere il bambino che l'elefante solleva/bagna
“(I would rather be) the child that the elephant is lifting/spraying”

Sentences produced:
(25) OR with resumptive clitic and preverbal subject: Che l’elefante la sta alzando
“(The child) that the elephant is lifting her”

(B.L.5;11)

(26) OR with resumptive DP: Che l’elefante bagna il bambino
“(The child) that the elephant is lifting the child”

(G.G. 5;10)

(27) OR with resumptive clitic and postverbal subject: Che la riprende l’elefante
“(The child) that the elephant is getting her”

(F.D. 4;11)

Target Sentence: Vorrei essere il bambino che il dottore/l'infermiera visita
“(I would rather be) the child that the doctor/nurse is examining”

Sentence produced:
(28) OR with resumptive clitic “mi” and overt subject: Che mi cura l’infermiera
“(The child) that the nurse is examining me”

(G.D. 6;1)

In the Singular Head/subject plural and Plural Head/subject singular battery we counted as correct ORs all those relatives with target number agreement within the relative clause. As number agreement disambiguates correct ORs, all productions with target number agreement within the relative clause were included in the results shown in Table 3, independently of the presence/position of the subject and of resumptive elements within the relative clause. (29) is an example of a correct OR with gap with Singular Head and subject plural, (30) is an example of a correct OR with gap with Plural Head and subject singular within the relative clause.

Plural Head/Subject (and verb) Singular battery
Target Sentence: Vorrei stare con i bambini che il dottore/l'infermiera visita
“(I would rather stay with) the children that the doctor is examining”

(29) Sentence produced: “Che il dottore visita”
“(The children) that the doctor is examining”

(F.B. 6;0)

Singular Head/Subject (and verb) plural battery
Target Sentence: “Il bambino che (i genitori) fotografano/disegnano (i genitori)”
“(The child that (the parents) are photographing/drawing (the parents)”

“(The child that (the parents) are photographing”

“(The child that (the parents) are photographing/drawing”

“(The child that (the parents) are photographing/drawing”

58
We analyze the total amount of SRs and unambiguous ORs produced by the children with a General Linear Model. As mentioned above, in the Plural head /subject singular and Singular head /subject plural tasks we considered all the ORs with target agreement within the relative clause, independently of the presence/position of the subject and the presence of resumptive elements\(^{31}\). In contrast, in the Singular head /subject singular task we excluded all those relatives with a postverbal/null subject within the relative clause, unless a resumptive clitic was present\(^{32}\), even though some of them might be correct target ORs. In the lack of a clear way of determining the amount of correct ORs in the Singular head /subject singular task, we have decided for a more constrained way of counting. Therefore, for the Singular head /subject singular task we often have a lower number of ORs compared to the two mismatch tasks (see table 3), which might represent an underestimation of the actual correct sentences produced by the children. Because of the different criteria used to select unambiguous ORs, we run two separate statistical analyzes, one which compares SRs and ORs across the three tasks and one which only takes into consideration the two mismatch tasks.

In the first analysis, we obtain a main effect of Sentence type, Year group and Task. Moreover, the three variables positively correlate (Sentence type and Year group: \(p<.001\), Sentence type and Task: \(p<.001\), Year group and Task: \(p<.003\); Sentence type, Task and Year group: \(p<.004\)). The *Bonferroni posthoc test* shows that the overall amount of SRs is significantly higher than the ORs produced in both match and mismatch conditions, \(p<.001\). For the reason mentioned above, we will not discuss in detail the other main effects and correlations, as the number of ORs in the Match condition might not represent a real estimation of the correct ORs produced by children. The correlation between Sentence type and Year group just seen in the analysis interestingly shows that age affects accuracy in production of the sentences under analysis.

In the second analysis, we compare production of SRs and ORs in the two mismatch batteries (Plural head /subject singular, Singular head /subject plural). The General Linear Model shows again a main effect of Sentence type and Year group, and a positive correlation between the two independent variables \(p<.001\). As far as age group is concerned, *Bonferroni posthoc test* shows that 3 years old children significantly differ from the other age groups (4, 6 and 7 y.o.: \(p<.001\); 5 y.o.: \(p<.003\); 8 y.o.: \(p<.005\)). Moreover, 8 years old children produce

\(^{31}\) Recall that mismatch in number agreement between the head of the relative and the subject (and verb) of the relative clause are sufficient to disambiguate between a SR and an OR interpretation in Italian relative clauses.

\(^{32}\) Recall that in the Singular head /subject singular task we considered as unambiguous ORs with resumptive clitics those relatives with 3rd or 1st person clitic pronouns and a postverbal subject and those with 1st person clitic pronoun and null subject within the relative clause.
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a significantly lower number of object relative clauses than 7 years old children (p<.011).

To sum up, the analysis reveals that the production of both SRs and ORs has a considerable improvement from age 3 to 4 and remains quite constant until the age of 7. At the age of 8, even though SRs are fully mastered, the number of ORs highly decreases. As we will see in paragraph 3.2.4, ORs at age 8 are mostly replaced by the use of passive ORs.

In the next section we will focus on the qualitative analysis of unambiguous ORs and in particular on resumptive ORs.

3.2.2 Resumptive ORs

We are now taking into account the different kinds of unambiguous ORs produced by the children in the three tasks.

Table 4 shows the percentages of OR with gap and resumptive ORs out of the total amount of unambiguous ORs produced by children. The data are presented by type of task and age group.

Table 4. Percentages of unambiguous ORs with gap and resumptive ORs in the three tasks (over the total amount of unambiguous ORs produced)

<table>
<thead>
<tr>
<th>Age</th>
<th>Singular Head/subject singular</th>
<th>Singular Head/subject plural</th>
<th>Plural Head/subject singular</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR gap %</td>
<td>res. OR %</td>
<td>OR gap %</td>
</tr>
<tr>
<td>3:4-3:11</td>
<td>10/44 23 34/44 77</td>
<td>5/19 26 14/19 74</td>
<td>31/47 66 16/47 34</td>
</tr>
<tr>
<td>4-4.11</td>
<td>4/66 6 62/66 94</td>
<td>15/46 33 31/46 67</td>
<td>25/73 34 48/73 66</td>
</tr>
<tr>
<td>5-5:11</td>
<td>1/53 2 52/53 98</td>
<td>9/43 21 34/43 79</td>
<td>32/83 39 51/83 61</td>
</tr>
<tr>
<td>6-6:11</td>
<td>4/59 7 55/59 93</td>
<td>17/54 31 37/54 69</td>
<td>68/151 45 83/151 55</td>
</tr>
<tr>
<td>7-7:11</td>
<td>9/48 19 39/48 81</td>
<td>12/49 24 37/49 76</td>
<td>53/97 55 44/97 45</td>
</tr>
<tr>
<td>8-8:10</td>
<td>9/44 20 35/44 80</td>
<td>28/48 58 20/48 42</td>
<td>46/68 68 22/68 32</td>
</tr>
</tbody>
</table>

As Table 4 clearly shows, children often produce resumptive ORs; the relative head is resumed either by a clitic pronoun or by a full lexical DP (corresponding to the relative head).

Although resumption is not a standard relativization strategy in Italian, it is relatively common at a colloquial/substandard level, with a clitic as the resumptive element. Note that resumptive relatives are attested cross

---

33 Recall that we consider unambiguous ORs of the Singular Head/subject (and verb) singular number matching condition and correct ORs. Moreover, we consider those ORs with correct number agreement within the relative clause of the Singular Head/subject (and verb) plural and Plural Head/subject (and verb) singular tasks.

34 In some cases the lexical DP is the exact copy of the relative head; but this is not always the case. Children sometime use DP which are only partly similar to the relative head (e.g. head: il bambino/ DP “quell’altro bambino” …)
linguistically both in child and adult languages. For this reason, we counted ORs with a resumptive pronoun as correct ORs target responses. We also counted as correct target OR unambiguous ORs with a resumptive full DP (see section 3.2.1 for examples).

In Table 4 the percentage of ORs with gap is generally lower than the number of OR with resumption in most of age groups' productions. However, it is important to underline the fact that in the Singular Head/subject singular task the number of ORs with gap is much lower than in the two mismatch batteries. As pointed out in Section 3.2.1., in the Singular head /subject singular task we excluded all those ORs with gap with a postverbal/null subject within the relative clause, even though some of them might be correct target ORs (Table 3). Therefore, for the Singular head /subject singular task we have a lower number of ORs with gap compared to the two mismatch tasks, as only those with a preverbal subject within the relative clause were taken into account.

Table 5 shows in detail the distribution of the resumptive ORs in the three tasks, with respect of the element resuming the head of the relative clause: a clitic pronoun or a full DP.

Table 5. Percentages of unambiguous ORs with resumption in the three tasks (over the total amount of resumptive ORs produced).

<table>
<thead>
<tr>
<th></th>
<th>Singular Head/subject singular</th>
<th></th>
<th>Singular Head/subject plural</th>
<th></th>
<th>Plural Head/subject singular</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>% res DP</td>
<td>% res. clitic</td>
<td>% res DP</td>
<td>% res. clitic</td>
<td>% res DP</td>
<td>% res. clitic</td>
</tr>
<tr>
<td>3:4-3:11</td>
<td>32</td>
<td>68</td>
<td>43</td>
<td>57</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>4-4.11</td>
<td>42</td>
<td>58</td>
<td>55</td>
<td>45</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>5-5:11</td>
<td>38</td>
<td>62</td>
<td>50</td>
<td>50</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td>6-6:11</td>
<td>25</td>
<td>75</td>
<td>35</td>
<td>65</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>7-7:11</td>
<td>49</td>
<td>51</td>
<td>67</td>
<td>33</td>
<td>43</td>
<td>57</td>
</tr>
<tr>
<td>8-8:10</td>
<td>34</td>
<td>66</td>
<td>50</td>
<td>50</td>
<td>54.5</td>
<td>45.5</td>
</tr>
</tbody>
</table>

Examples of an ORs with a resumptive clitic and an OR with resumptive DP are given in (31) and (32) respectively.

Target Sentence: Vorrei essere il bambino che l'elefante solleva/bagna
“(I would rather be) the child that the elephant is lifting/spraying”

Sentences produced:
(31) OR with resumptive clitic: Che l’elefante la sta alzando
“(The child) that that the elephant is lifting her”

(B.L.5;11)

(32) OR with resumptive DP: Che l’elefante bagna il bambino
In example (33) the resumptive pronoun used by the children is a third person clitic pronoun. However, in some cases, children also produced ORs with first person clitic pronoun “mi” (33). The 1st person clitic pronoun might indicate a direct identification of the child with the character of the action.

Target Sentence: Vorrei essere il bambino che il dottore/l’infermiera visita

“(I would rather be) the child that the doctor/nurse is examining’’

Sentence produced:
(33) OR with resumptive “mi”: Che mi cura l’infermiera

“(The child) that the nurse is examining me”

(G.D. 6;1)

As Table 5 shows, from age 4 the number of clitic pronouns is generally higher than that of resumptive DPs. This phenomenon is mostly visible in the Singular head/subject (and verb) singular and Plural head/subject (and verb) singular tasks. Despite the prevalence of clitics over full DPs, the latter are still produced by the older age groups (7-8 years old). As one may expect the resumptive DP strategy to decrease to a higher extent in 8 and 7 years old children ORs since it is not an available strategy in the adult language – not even at the substandard level -, we also compared the results of the three batteries (Table 5) with a different type of elicitation task (Table 6). The aim was to find out whether the presence of resumptive DPs in older groups might be related to the type of task administered to the children.

In the Preference production tasks (see section 3 for a detailed description) the child is asked to decide between two children/groups of children, which are mentioned several times by the experimenter in each trial of the task (two times as object of the actions and one time in the question, e.g. The doctor examines one child, the nurse examines the other child. Which child would you rather be? Start with “I would rather be . . .’’). So, it could be that in the Preference production tasks the way in which the task is presented to the child, repeating the object of the action, might influence the production of a higher number of full DPs in the object position of the relative clause.

The fourth task, adapted from Novogrodsky and Friedmann (2006), aims at eliciting SR and OR as description of pictures. Pairs of pictures, each featuring two figures, were presented. One picture showed one of the figures carrying out an action on the other, while the second picture showed the same figures with the roles reversed. The experimenter described the two scenes using simple sentences, then asked the child a question about one of the figures in order to elicit either a SR (34) or a OR (35):

In these pictures there are two elephants. In one picture the elephant is spraying the lion and in the other picture the lion is spraying the elephant. Which elephant is this (pointing to the first picture)? Start with “This is the elephant....’’

Not all DPs counted as resumptive are identical full copies of the head of the relative clause, as noted in the preceding footnote.
(34) Target SR: L’elefante che bagna il leone  
“The elephant that is spraying the lion”  
*And now which elephant is this (pointing to the second picture)? Start with “This is the elephant...”*

(35) Target OR: L’elefante che il leone bagna  
“The elephant that the lion is spraying”

Table 6 shows the results of ORs with resumptive clitics and resumptive DPs in the Picture Description Task. Only a subset of the age groups (e.g., older children from 5 to 8 years of age) is presented in the table.

<table>
<thead>
<tr>
<th></th>
<th>5-5:11</th>
<th>6-6:11</th>
<th>7-7:11</th>
<th>8-8:11</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR with resumptive DP</td>
<td>15</td>
<td>23</td>
<td>45</td>
<td>13</td>
</tr>
<tr>
<td>OR with resumptive clitic</td>
<td>85</td>
<td>77</td>
<td>55</td>
<td>87</td>
</tr>
</tbody>
</table>

The hypothesis that the type of task might influence the production of OR with resumptive DPs is partly confirmed by the results in Table 6. In the Picture description task, the difference between ORs with resumptive clitic and ORs with resumptive DPs is higher than in the Preference tasks from age 5. Moreover, resumptive DPs in the older group (8 years old) are virtually disappearing.

Notice also incidentally that the 7 years old group still produces a not-negligible amount of ORs with resumptive DPs. This might be a side effect of the lower number of subjects that participated in this group, compared to the 6 and 8 years old group. This is also the group which made a rather limited use of Passive Object Relatives, as shown in 3.2.4. The results of this group thus look peculiar in two (related) respects, which suggests that this age group should be further tested in the future.

In the next section we turn to a further qualitative aspect of the results and consider the produced ORs according to the pre- or post-verbal position of the subject within the relative clause.

3.2.3 The position/presence of the subject in ORs with resumptive clitics and ORs with gap
In this section we analyze ORs with gap and resumptive ORs with respect to the presence/position of the subject within the relative clause. ORs with resumptive DPs always have a preverbal or null subject within the relative clause (see example (38)). In contrast, ORs with resumptive clitic might either have a preverbal or a postverbal or a null subject within the relative clause.

In the analysis, we are taking into account only the Plural head /subject singular and the Singular head /subject plural tasks as they provide a clearer picture of the distribution of the subject in ORs, especially in ORs with gap. Results of the two batteries have been collapsed, as they show the same trend.

We remind the reader that in the Singular head /subject singular task we excluded ORs with gap that either have a postverbal or null subject, as they have an ambiguous interpretation (see section 3.2). For this reason, we are likely to have underestimated the number of ORs with gap in this task, as (possibly) some of them could actually be correct ORs with postverbal/null subject within the relative clause. We are not going to present data of the Singular head /subject singular task in this section, focusing on the two mismatch conditions only.

Table 7 and Table 8 show the distribution of the subject within the relative clause in unambiguous ORs with gap and in clitic resumptive ORs, respectively. The percentages are calculated over the total amount unambiguous ORs produced by each age group.

Table 7. Distribution of the subject in ORs with gap (Plural head /subject singular and the Singular head /subject plural tasks)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Preverbal Subject</th>
<th>Postverbal Subject</th>
<th>Null Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>9/66 13.6%</td>
<td>21/66 31.8%</td>
<td>6/66 9%</td>
</tr>
<tr>
<td>4-4:11</td>
<td>3/119 2.5%</td>
<td>30/119 25.2%</td>
<td>7/119 5.8%</td>
</tr>
<tr>
<td>5-5:11</td>
<td>2/126 1.5%</td>
<td>27/126 21.4%</td>
<td>12/126 9.5%</td>
</tr>
<tr>
<td>6-6:11</td>
<td>30/205 14.6%</td>
<td>47/205 22.9%</td>
<td>8/205 3.9%</td>
</tr>
<tr>
<td>7-7:11</td>
<td>32/146 21.9%</td>
<td>24/146 16.4%</td>
<td>9/146 6.1%</td>
</tr>
<tr>
<td>8-8:10</td>
<td>36/116 31%</td>
<td>30/116 25.8%</td>
<td>8/116 6.8%</td>
</tr>
</tbody>
</table>

Table 8. Distribution of the subject in ORs with resumptive clitics (Plural head /subject singular and the Singular head /subject plural tasks)

<table>
<thead>
<tr>
<th>ORs with resumptive clitics</th>
<th>ORs with resumptive clitics</th>
<th>ORs with resumptive clitics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As mentioned in section 3.2.2., resumptive ORs with null subject within the relative clause that we counted as correct are those with a 1st person clitic pronoun. 3rd person clitic pronouns and null subjects give rise to ambiguity between SR and OR interpretation.
The productions in (36)-(41) are examples of ORs with gap and either a preverbal (36), postverbal (37) or null subject (38) within the relative clause. Examples (39)-(41) show resumptive ORs with either a preverbal (39), postverbal (40) or null subject (41) within the relative clause.

Target sentence: “(Vorrei stare) con i bambini che la zia fotografa/disegna”
“(I would rather stay) with the children that the aunt is photographing/drawing”

OR with gap and preverbal subject:
(36) Sentence produced: “Che la zia fotografa”
“(The child) That the aunt is photographing”

Target sentence: “(Vorrei stare) con i bambini che il papà pettina/abbraccia”
“(I would rather stay) with the children that the father is combing/hugging”

OR with gap and postverbal subject:
(37) Sentence produced: “Che abbraccia il papà”
“(The child) That the father is hugging”

OR with gap and null subject:
(38) Sentence produced: “Che abbraccia”
“(The child) That (the father) is hugging”

Target sentence: Vorrei stare coi bambini che il dottore/l'infermiera visita
“(I would rather stay with) the children that the doctor/nurse is examining”

OR with resumptive clitic and preverbal subject:
(39) Sentence produced: “Che l’infermiera li cura”
“(The children) that that the nurse is examining them”

OR with resumptive clitic and postverbal subject:
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(40) Sentence produced: Che li visita il dottore
   “(The children) that that the doctor is examining them”
   (E.V.4:10)

Target sentence: “(Vorrei stare) con i bambini che il papà pettina/abbraccia”

OR with resumptive clitic and null subject:
(41) Sentence produced: “Che li abbraccia”
   “(The children) that (the father) is hugging them”
   (B.L. 5:11)

In the next section, we will analyze the emergence of passive and its use as a way to avoid ORs in children. In section 3.2.5, the use of passive in children will be compared to the results collected with adult speakers of Italian.

3.2.4 Passive Object Relatives: children

As discussed in Belletti & Contemori (2010), children around the age of 5 start producing passive object relatives (see also Utzeri 2007 and Belletti 2009 for similar results on school-age children).

The OR is transformed into a SR by means of different kinds of passive, as illustrated by the productions in (42)-(44). Tables 9 shows in detail the percentages of the different kinds of passive produced by children in the three tasks. Data of the three tasks are collapsed, as they show a similar trend. As is clear from the results, the use of passive to avoid an OR increases with age.

Target Sentence: (Vorrei essere) il bambino che la mamma/ragazza abbraccia
   “(I would rather be) the child that the mother/girl is hugging”
(42) “Si fa”/Causative passive: Quello che si fa abbraccia’ dalla mamma
   “The one that is hugged by the mother”
   (E.D. 6;2)

(43) Copular passive: Quello che viene abbracciato dalla mamma
   “The one that is hugged by the mother”
   (B.G. 6;3)

Target Sentence: (Vorrei essere) il bambino che il maestro/nonno fotografa
   “(I would rather be) the child that the teacher/Grandpa
   photographs”
(44) Reduced passive: Fotografato dal nonno
   “(The child) Photographed by the Grandpa”
   (F.C. 4;11)

Table 9. Percentages of passive ORs produced by children in all the three
   task: Plural Head/subject (and verb) singular; Singular Head/subject (and
   verb) singular; Singular Head/subject (and verb) plural

<table>
<thead>
<tr>
<th></th>
<th>3:4-3:11</th>
<th>4-4:11</th>
<th>5-5:11</th>
<th>6-6:11</th>
<th>7-7:11</th>
<th>8-8:11</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR “Si fa passive”</td>
<td>-</td>
<td>1.9</td>
<td>4.6</td>
<td>8.5</td>
<td>0.3</td>
<td>8.8</td>
</tr>
<tr>
<td>OR Copular passive</td>
<td>-</td>
<td>-</td>
<td>5.1</td>
<td>3.5</td>
<td>0.3</td>
<td>34.6</td>
</tr>
</tbody>
</table>
Causative passive (labeled “si fa” passive) appears to be the first kind of passive to emerge in children’s productions, around the age of 4 and 5. At age 5, we can observe that children also start producing sentences with copular passive. Reduced passive, on the other hand, seems to develop somewhat later, around 6 years of age.

Passive is consistently used to avoid ORs at the age of 8, with copular passive preferred over the other kinds of passive. It is interesting to note that 8 years old children still produce causative passive to a certain extent. We will come back to this result in the next section, when comparing children to adult controls.

It is important to notice that the use of passive is not uniform through the age groups. In Table 10, we present the total number of children taking part into the study and the number of children in each group who produced at least one passive OR in one of the three tasks.

<table>
<thead>
<tr>
<th>OR Reduced passive</th>
<th>-</th>
<th>-</th>
<th>1.6</th>
<th>1</th>
<th>5.1</th>
<th>2.9</th>
</tr>
</thead>
</table>

Table 10. Number of participants who adopt passive ORs in each age group (Preference Tasks)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Number of participants</th>
<th>Participants producing passive ORs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>12</td>
<td>-</td>
</tr>
<tr>
<td>4-4:11</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>5-5:11</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td>6-6:11</td>
<td>23</td>
<td>8</td>
</tr>
<tr>
<td>7-7:11</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>8-8:10</td>
<td>22</td>
<td>16</td>
</tr>
</tbody>
</table>
As clearly emerges from Tables 9 and 10, passive emerges gradually and seems to be adopted consistently by a small subset of children in each age group. The number of children adopting passive ORs, relatively to the size of the age group, remains rather constant until the age of 8. In 8 years old children it drastically increases and more than half of the participants use it productively.

Results of Table 10 are confirmed by productions collected with an additional elicitation test. In Table 11, we present the percentages of passive ORs produced by the same children with a Picture Description Task (see section 4.2.2 for a description of the task).

Table 11. Total amount of passive ORs produced by children in the Picture Description Task.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>OR “Si fa” passive</th>
<th>OR Copular passive</th>
<th>OR Reduced passive</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>0.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4-4:11</td>
<td>3.2</td>
<td>4</td>
<td>0.4</td>
</tr>
<tr>
<td>5-5:11</td>
<td>16.8</td>
<td>6.9</td>
<td>7.5</td>
</tr>
<tr>
<td>6-6:11</td>
<td>20.4</td>
<td>10.8</td>
<td>0.9</td>
</tr>
<tr>
<td>7-7:11</td>
<td>8.75</td>
<td>31.5</td>
<td></td>
</tr>
<tr>
<td>8-8:10</td>
<td>40.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data in Table 11, replicate the results observed in the Preference Task (Table 9). By comparing results in Table 11 and 9, it clearly emerges that children produce a higher amount of passive ORs in the Picture description Task (Table 11) than in the Preference Tasks (Table 9). Furthermore, looking at the number of children that adopt passive to avoid ORs in the Picture Description Task (Table 12) in comparison to the Preference Tasks (Table 10), we observe that an increased number of participants produce passive ORs, in particular from age 5 to 8. Therefore, use of a different kind of task reveals that a higher number of children has acquired passive as a productive way to avoid ORs.

Table 12. Number of participants who adopt passive ORs in each age group (Picture Description Tasks).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total Number of participants</th>
<th>Participants producing passive ORs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:4-3:11</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>4-4:11</td>
<td>14</td>
<td>2</td>
</tr>
<tr>
<td>5-5:11</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>6-6:11</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>7-7:11</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>8-8:10</td>
<td>22</td>
<td>19</td>
</tr>
</tbody>
</table>
In the following section we present data collected with adult speakers of Italian. We will then compare children’s and adults production of ORs.

3.2.5 *Passive Object Relatives: adults*

The results discussed in the previous section are particularly interesting if we compare them with the adults’ responses presented in Table 13. The table sums up the amount of SRs and ORs produced by the Italian adult speakers. 10 Italian adult speakers participated in the Plural Head/subject (and verb) singular task and 18 participated in the Singular head/subject (and verb) singular or plural task. The adult control groups are aged 18-28.

**Table 13. Percentages of relatives produced by adults.**

<table>
<thead>
<tr>
<th></th>
<th>Plural Head/subject (and verb) singular</th>
<th>Singular head/subject (and verb) singular</th>
<th>Singular head/subject (and verb) plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR</td>
<td>97</td>
<td>99.5</td>
<td>-</td>
</tr>
<tr>
<td>OR</td>
<td>10</td>
<td>11.6</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Unlike children, adults produce ORs only in very few cases. The very low production of ORs strongly contrasts with their ceiling level performance on SRs, as illustrated in Table 13.

Instead of ORs, Italian adults prefer to produce passive ORs, as shown in Table 14.

**Table 14. Percentages of Passive ORs produced by adults in the three tasks**

<table>
<thead>
<tr>
<th></th>
<th>Plural Head/subject (and verb) singular</th>
<th>Singular head/subject (and verb) singular</th>
<th>Singular head/subject (and verb) plural</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Si fa” passive</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Copular passive</td>
<td>67</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>Reduced passive</td>
<td>21</td>
<td>47</td>
<td>59</td>
</tr>
</tbody>
</table>

37 The remaining productions when a SR or an ORs is expected are equally relatives with either Change of Character or change of verb, declarative clauses and other productions.
The production of passive ORs emerging around the age of 5 (Table 9-11) becomes the most widespread strategy to avoid ORs in the adult age (Table 14). Note that, whereas children make extensive use of causative “si fa” passive in their passive ORs, this kind of passive is never used by adult controls. Indeed, adults prefer to use copular and reduced passive to a comparable extent.\textsuperscript{38}

In the following sections, we will move to a different study which investigates the comprehension of passive ORs in Italian children aged 6-8:10.

4. Study II: Comprehension
In Section 3.2.2 we pointed out that, among the unambiguous ORs produced, children of all age groups often use resumptive ORs. In section 3.2.3 we observed that children from the age of 5 start producing passive ORs when an active ORs are expected and their production gradually increases with age. Therefore, elicited production clearly indicates the presence of resumptive and passive ORs at different stages of children's grammar. Given the findings of Study I on production, we decided to further test the two structures in comprehension. In particular, in study II we investigate the comprehension of ORs with gap, ORs with resumptive clitics and (different types of) passive ORs in Italian children from 6:5 to 8:10 years old. The main reason of choosing this age range is that children from the age of 6 are known to comprehend passive in Italian (as shown by Manetti (2008), MA Thesis, University of Siena).

4.1 Participants
3 Italian-speaking children Italian aged 6:5-8:10 participated in the comprehension study. The children, who came from a public school in Chianciano Terme (SI), were divided into three age groups. They also took part in the elicitation study.

Table 15 shows the number and the age mean of each age group.

<table>
<thead>
<tr>
<th>Age groups</th>
<th>N of participants</th>
<th>Age mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:5-6:11</td>
<td>19</td>
<td>6:4</td>
<td>0:4</td>
</tr>
<tr>
<td>7-7:11</td>
<td>12</td>
<td>7:5</td>
<td>0:4</td>
</tr>
<tr>
<td>8-8:10</td>
<td>22</td>
<td>8:5</td>
<td>0:3</td>
</tr>
</tbody>
</table>

4.2 Material

\textsuperscript{38} Notice that in the Plural Head/subject (and verb) singular adults have a preference in the use of copular passive over reduced passive. In the Singular head/subject (and verb) singular or plural, however, this tendency is reversed. If the data of the two tasks are collapsed, the amount of ORs with copular passive produced by adults is comparable to the amount of reduced passive.
Comprehension of ORs and passive ORs was tested with a binary picture comprehension task adapted from Friedmann and Novogrodsky (2004). The aim of the test is to observe whether (and from which age) children comprehend those relatives that they appear to master in production (e.g., different types of passive ORs and ORs with resumptive clitic).

We included in the task items testing ORs with a gap and a preverbal subject within the relative clause, non-standard ORs with resumptive clitic pronoun (see section 3.2.4 for a discussion of children’s production of resumptive ORs) and three types of passive ORs (see section 3.2.6).

Each subject was presented with two pictures and was asked to choose the one which matched the sentence read by the experimenter. The first of each pair of pictures showed a figure carrying out an action on another figure, while the second picture showed the same figures with the roles reversed. Comprehension of 60 sentences was tested: 12 right-branching ORs (45), 12 right-branching ORs with resumptive clitic (46), and 36 right-branching passive ORs. Passive ORs include 3 different types of verbal passive: 12 items with a causative passive (47), 12 items with a copular passive (48), 12 items with a reduced passive (49).

(45) Mostrami la bambina che la giraffa lava
    “Show me the child that the giraffe is washing”
(46) Mostrami la bambina che la giraffa la lava
    “Show me the child that the giraffe is washing her”
(47) Mostrami la bambina che si fa lavare dalla giraffa
    “Show me the child that is washed by the giraffe”
(48) Mostrami la bambina che è lavata dalla giraffa
    “Show me the child that is washed by the giraffe”
(49) Mostrami la bambina lavata dalla giraffa
    “Show me the child washed by the giraffe”

All the sentences were semantically reversible and the noun phrases were always animate. They were presented in random order.

4.5 Coding
The experiment was administered to children in individual sessions in a separate, quiet room in their school. All the responses of the participants were transcribed during each session. The child heard the sentence and was asked to point to the picture matching the sentence. No time limit was set and, when the child requested, the experimenter repeated the sentence.

5. Results
Table 16 shows the total amount of correct responses scored by the three age groups in the comprehension task. The row scores and the correspondent percentages are grouped by age group and type of condition.

Table 16. Number and Percentages of relatives correctly comprehended by children of the three age groups
Disentangling the mastery of object relatives in children and adults

<table>
<thead>
<tr>
<th></th>
<th>6-6:11</th>
<th>7-7:11</th>
<th>8-8:10</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR with gap</td>
<td>143/228</td>
<td>62.7</td>
<td>170/264</td>
</tr>
<tr>
<td>OR with resumptive clitic</td>
<td>151/228</td>
<td>66.2</td>
<td>203/264</td>
</tr>
<tr>
<td>OR “Si fa passive”</td>
<td>189/228</td>
<td>82.9</td>
<td>250/264</td>
</tr>
<tr>
<td>OR Copular passive</td>
<td>173/228</td>
<td>75.9</td>
<td>243/264</td>
</tr>
<tr>
<td>OR Reduced passive</td>
<td>176/228</td>
<td>77.2</td>
<td>247/264</td>
</tr>
</tbody>
</table>

The data have been analyzed with a General Linear Model. The analysis revealed a main effect of sentence type ($p<.004$) and a main effect of age group ($p<.001$), but no interaction between the two variables. Bonferroni posthoc test shows that 6 and the 7 years old differ significantly from the 8 year old group ($p<.001$ and $p<.021$, respectively). On the other hand, the difference between 7 and 6 years old group is not significant. Moreover, the effect of sentence type emerges when comparing ORs with both gap and resumptive clitic to passive ORs of all types ($p<.001$). No statistical significance is found between the comprehension of ORs with gap and ORs with resumptive clitic and between the comprehensions of the three types of passive ORs.

Even though no interaction between age and sentence type emerged from the first analysis, a developmental pattern can be observed in the row data (Table 16), at least as far as passive ORs are concerned. For this reason, we run two General Linear Model analyses, separating OR with gap and ORs resumptive clitic from passive ORs, to verify whether this intuition could apply to our data.

If we take into account ORs with gap and ORs with clitic pronoun, the General Linear Model shows that there is a main effect of sentence type ($p<.035$), while age does not represent a significant factor and does not interact with sentence type. Therefore, analyzing the two types of sentences separately, we can observe that OR with gap and ORs with clitic pronoun are comprehended better than ORs with gap; however, this difference does not seem to be affected by age. Conversely, when we compare the three types of passive ORs only, we don’t find an effect of sentence type, but we observe a main effect of age ($p<.001$). Bonferroni posthoc test shows that 8 years old perform significantly better than 6 and 7 years old children ($p<.001$ and $p<.015$, respectively) and the 7 years old group is significantly better than the 6 years children ($p<.044$). Therefore, while children understand equally well the three kinds of passive ORs a clear developmental pattern emerges, with children performing better with all kinds of verbal passive with age.

6. Discussion
We concentrate our discussion on the two most significant aspects of our results: first, the overwhelming preference for Passive Object Relatives in the adults’ productions when an OR is elicited, and the fact that children approach the adults’ behavior as they grow older; second the fact that Passive Object...
Relatives are also preferred in comprehension by children, at the age in which they can master passive. We also briefly comment on other aspects, in particular the fact that resumptive ORs are rather frequently produced by children. We start the discussion from this last point.

6.1 Resumptive ORs
As shown in Table 4, children of all ages often produce resumptive relatives in place of the standard ORs which, in Italian, have a gap in the merge position of the relative head. When resumption is realized through a clitic pronoun, the strategy used by children corresponds to a colloquial/informal, slightly substandard, way of forming an OR in current standard Italian. Beside this kind of resumptive object relatives, children of all ages, also frequently adopt a form of resumption which is not possible in current standard Italian, not even at the substandard level: they use a lexical DP corresponding to the relative head. As shown in Table 5, resumption through a clitic or through a full DP is quite balanced in our results from the three batteries of the Preference task. Resumption through a clitic, is instead clearly much preferred to DP resumption in the Picture description task. From the comparison of the results in the two tasks, we tend to conclude that the relatively significant presence of DP resumption in the Preference task is in fact mainly an artifact of the design. As noted, DP resumption is extremely low in the older children of our groups in the Picture description task. Given the task related shape of the data on DP resumption, we do not make any explicit hypothesis on what exactly the phenomenon could correspond to in the children’s productions. In part, it could be a real form of resumption, a repetition of the head of the relative clause, a possibility that some languages do allow as a grammatical option. As has been occasionally but repeatedly noted in the literature, this is a strategy that especially young children tend to adopt in their first productions of ORs (see Guasti & Cardinaletti 2003, Utzeri 2007, Labelle 1990, 1996, Pérez-Leroux 1995, De Viliers et al. 1994, a.o.). In this respect, the developmental path of the Picture description task looks coherent with previous results, from different languages. However, as it is not always the case that the resumptive DP in the relative clause realizes an exact copy of the relative head (footnote 7), one cannot be sure of what kind of computation children are actually implementing in cases of this sort. Hence, considering both the task related shape of the results pointed out above, and the heterogeneous form of the resumptive DP just noted, we do not attempt at any speculation in regard to this type of resumptive object relatives.

The situation is different with clitic resumption, a possible option in colloquial/informal Italian, as noted\(^{39}\). In this case, we can simply assume that children are using a relativization strategy which is available in the language, possibly implemented with a doubling derivation, with movement of the relative head and stranding of the clitic inside the relative clause (Belletti (2009a, chapter 11, for discussion). Given the colloquial, informal level of clitic resumptive object relatives, it is no surprise that children adopt this strategy to a not negligible extent.

\(^{39}\) And also often the only option of forming an object relative clause in various dialects of Italy.
Our results also suggest a possible correlation between use of resumption and position of the subject in the relative clause, as there is a tendency to have more resumptive Ors when the subject is preverbal (with the exception of the oldest group of children). As we will discuss in some detail in the following section, presence of a preverbal subject creates a disturbing intervention configuration in the computation of an OR (Friedmann, Belletti, Rizzi 2009, Belletti 2009, 2010; Belletti & Contemori 2010). To the extent that stranding part of the relative DP head in the merge position in the relative clause can be considered a somewhat facilitating strategy (e.g. Utzeri 2007, for discussion along these lines), it is tempting to interpret the described tendency as ultimately due to intervention: an easier relativization strategy is mostly adopted in the hardest configuration. A complementary aspect of the same tendency is also indicated by preference for a gap OR in cases in which the subject is located post-verbally. However, as this aspect of the results, considering the correlation between gap/resumptive ORs and position of the subject (Tables 7, 8), only suggests a tendency and not a robust finding, we do not strongly endorse the view that relativizing through clitic resumption necessarily qualifies as a facilitating strategy and leave the suggestion at this speculative level, pending further evidence from further research. See 6.3. for further relevant considerations.

6.2 Passive Object Relatives in production
The production of Passive Object Relatives in both the adopted designs presented in this article, is much more than a tendency, it is a strong result for adults, and a very clear developmental path for children. In essence, adults produce very few target object relatives and produce instead around 90% of Passive Object Relatives in all tasks; children tend to approach the adults’ performance, as is clearly shown by the significant number of Passive Object Relatives in the older children. As passive is known to develop around age 5-6 (in Italian) it is no surprise that it may be utilized to a greater extent by the children of the oldest group. However, children of all ages in the Picture description task and children from age 4 on in the Preference task do produce few Passive Object Relatives, indicating that their attempt at avoiding the production of an (active) object relative in a way that the intended meaning may be preserved - as it happens in the case of a Passive Object Relative - starts out from very early on.

Following Belletti (2009, 2010), Belletti & Contemori (2010), we interpret the emergence of use of passive in the relative clause when an object relative is elicited as a most suitable way to avoid the disturbing intervention of the preverbal subject, which inevitably occurs in the establishment of the dependency between the relative head and the gap in its merge object position within the relative clause. Presence of the intervening (lexical) subject would be problematic for locality, expressed through a featural approach to the Relativized Minimality principle (Rizzi (1990, 2004)), along the lines proposed in Friedmann, Belletti, Rizzi (2009). The intervention situation is illustrated in (50)\textsuperscript{40}.

\textsuperscript{40} In (50) the intervening subject is indicated as DP(S) and the dependency of the relative head in CP and its merge position in the relative clause is indicated in terms of movement, along the raising analysis of relative clauses (Bianchi (1999, 2002). DP(S) is indicated both in the vP
Assuming a derivation of passive in the terms proposed in Collins (2005), intervention by the subject is altogether avoided in passive sentences. Given the assumed derivation, a crucial step is involved in passive: the operation which takes a chunk of the verb phrase containing (at least) the verb and the direct object, and moves it across the vP-internal subject DP, smuggling in Collins’s terminology. Movement of this chunk of the verb phrase has the direct consequence that it allows movement of the object into the relative head position in the CP, without any violation of locality, as there is no intervention of the subject from the moved /smuggled position (Belletti & Rizzi (2010) for further discussion). The relevant steps of this assumed derivation are illustrated in (51):

(51)  
\[
\text{Il bambino che è [VP abbracciato <il bambino>] da [VP la mamma <VP>]} 
\]

Locality is then the fundamental principled reason which leads to passive in the production of object relatives across an intervening preverbal lexical subject, as would be the case in all the elicited object relatives of the tasks reported in this work.

6.3 The Comprehension of Passive Object Relatives
The coherence of the results of our comprehension experiment with children, with those found in production is especially interesting and neat. We decided to test children from age 6 on, as we wanted to be reasonably sure that the children were at an age in which they could master passive fairly well. And indeed they did understand all three types of Passive Object Relatives tested. Comprehension increases with age, and it becomes almost perfect in the age range 8-8:10; it is, however, already very good at age 6, as Table 16 clearly indicates. The interesting aspect of our results here is the comparison between the almost perfect comprehension of Passive Object Relatives with the comprehension of (active) object relatives both with a gap and with a resumptive clitic, which is much lower, for all age groups, and it remains fairly constant and does not increase with age. We interpret this result as a clear indication that, once again, the hardest structures are those where intervention by the subject is at stake.\(^{41}\) The passive structures, in which, according to the internal merge position and in the high subject position in TP: in either position the subject would intervene in the establishment of the relevant dependency

\(^{41}\) Recall that the subject was always preverbal in the sentences tested.
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analysis illustrated in 6.2, no intervention occurs, are those which are best understood.

As we saw, in the production experiments the overwhelmingly adopted way to realize an object relative clause is through the production of a Passive Object Relative; in comprehension, where the structures to process are given by the experimenter, the clear preference for Passive Object Relatives over active object relatives is indicated by the significantly better understanding of the former compared to the latter, with no significant difference as to whether the object relative clause contains a gap or is realized with a resumptive clitic. This latter aspect of the results may suggest that clitic resumption is a way to realize an object relative which probably shares significant properties with relativization with a gap. This is indeed expected under the analysis involving movement + stranding of the clitic pronoun mentioned in 6.1. This analysis makes one expect that, other things being equal, an object relative with a gap and an object relative with a resumptive (clitic) pronoun should have an essentially comparable status. This is what the comprehension results strongly suggest. If this conclusion is correct, the impression that clitic resumption may represent a facilitating strategy in production (6.1), may turn out to be mainly epiphenomenal. We leave the development of this hypothesis to future further research.

7. Conclusion

The main result presented here is twofold: first, the fact that Passive Object Relatives have been confirmed to be the most privileged strategy to avoid the production of an object relative in the assumed experimental conditions, adopted by both adults and children, and that this strategy is developmentally preferred, as older children tend to adopt it more and more; second, the fact that a parallel result is found in comprehension, with the comprehension of different kinds of Passive Object Relatives giving consistently significantly better results than the comprehension of (active) object relatives, both with a gap and with a resumptive clitic pronoun. We have proposed, following previous work, that Passive Object Relatives may acquire this privileged status as they represent a most suitable way, possibly an optimal way (Belletti 2010), to avoid the intervention of the lexical subject in the establishment of the dependency between the relative head and its merge position as the object of the relative clause. This is so, since the smuggling derivation of passive à la Collins (2005), primarily yields a computation in which no intervention arises in the movement of the object both into the subject position of the clause and into the position of the relative head.

A featural approach to Relativized Minimality, along the lines proposed in Starke (2001), Rizzi (2004), leads one to expect that other ways may modulate intervention in the computation of an object relative clause. In particular, a mismatch in features between the relative head and the intervening lexical subject may ameliorate in principle the processing of an object relative clause. In the number mismatch conditions created in the production tasks designed in this work, this has not turned out to be the case, as Passive Object Relatives have been the preferred production selected in all conditions anyway, by both adults and (older) children. It can be speculated that this overwhelming preference for Passive Object Relatives could be a partly task related effect,
ultimately linked to the fact that both the relative head and the subject of the relative clause are animate in the adopted experimental conditions. Current work in progress (Belletti & Chesi in prep) on both a corpus analysis and on a version of the Preference Production task controlling for the animacy feature in the mismatch condition, is addressing precisely this issue; preliminary results indicate that the issue is likely to be set in precisely these terms, with the production of object relatives increasing for adults in the animacy mismatch condition. Indeed, number mismatch has been shown to facilitate the comprehension of an object relative clause with an intervening lexical subject in various experimental conditions (Adani 2010, Adani et al. 2010, Arosio et al. 2009). Gender mismatch as well has been shown to facilitate the comprehension of object relative clauses, with interesting contrasting results between languages (e.g. Hebrew vs Italian, Belletti, Friedmann, Brunato, Rizzi submitted). Hence, it is to be expected that mismatch in further relevant morphosyntactic features may facilitate parsing to various extents. The main contribution of the results presented in this work has been to show that passive in relatives may have a clear effect in enhancing both the production and the comprehension of object relative clauses, with Passive Object Relatives much preferred over other possible structures, including resumptive object relative clauses, and often overwhelmingly so.

References


Belletti, A., Chesi C. (in prep.) Relative clauses from the input. Syntactic considerations from a corpus-based analysis of Italian. Ciscl-University of Siena.

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Appendix – graphs

Figure 1. Total amount of SR and OR produced by children in the three batteries of the Preference task (data of the three batteries and data of the age groups have been collapsed).

Figure 2. Total amount of unambiguous ORs with gap and resumptive ORs over the total amount of unambiguous ORs produced (data of the three tasks have been collapsed)
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Figure 3. Percentages of Passive Object Relatives produced by children in all the three batteries of the Preference task: Plural Head/subject (and verb) singular; Singular Head/subject (and verb) singular; Singular Head/subject (and verb) plural

Figure 4. Total amount of SR and OR produced by adults (data of the three batteries of the Preference task collapsed)
Figure 5. Total amount of adults’ productions when an OR is expected (data of the three batteries of the Preference task collapsed)
A comparative view on answering strategies and new information subjects in Brazilian Portuguese and Finnish

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The paper presents a comparative study on subject focalization in Brazilian Portuguese (BP) and Finnish, and in particular on the structures displayed by these languages to focalize subjects in context of new information focus (SNI). The interest of studying subject focalization in BP and in Finnish comes from their peculiar status as partial null subject languages (PNSL), even if at different degrees (cf. Kato (2000); Holmberg 2009). Data have been collected through the experimental design used by Belletti & Leonini (2004) and Belletti, Bennati & Sorace (2007) on answering strategies (cf. Belletti 2006, 2008) which has been administrated to adult native speakers of BP and Finnish. It will be shown that interestingly, both in BP and in Finnish the VS order is not adopted in the relevant SNI focus contexts. When occurring, the VS order is restricted to syntactic-pragmatic conditions which are not observed in the parallel structure in languages like Italian. Hence, the observations on the BP and Finnish data are relevant not only for a comparative analysis of focalization strategies in two PNSL but also because they provide further evidence to the cartographic approach that we are assuming (cf. Cinque (2002), Rizzi (2004), Belletti (2004)).

0. Introduction
The aim of this work is to present a comparative study between subject focalization in Brazilian Portuguese (BP) and in Finnish. More specifically, we will be concerned with the structures displayed by these languages to focalize subjects in context of new information focus (SNI). The data in the present study have been collected through the experimental design (cf. § 6 for a detailed description) first successfully used by Belletti & Leonini (2004) and Belletti, Bennati & Sorace (2007) on answering strategies (cf. Belletti 2006, 2008). From a theoretical point of view, the research is based on relevant recent literature within the cartographic framework (cf. Cinque (2002), Rizzi (2004), Belletti (2004)) and assumes, in particular, the analyses proposed by Rizzi (1997) for contrastive focus and topic constructions and those assumed by Belletti (2001, 2004, 2005) for sentences with new information focus.

The interest of studying subject focalization in BP and in Finnish comes from their peculiar status as partial null subject languages (PNSL), even if at different degrees (cf. (Kato 2000); Holmberg 2009). Hence, the observations on the BP and Finnish data are relevant not only for a comparative analysis of
focalization strategies in two PNSL but also because they provide further evidence to the subject focalization theory that we are assuming.

Data coming from the Brazilian Portuguese and Finnish versions of the experimental task provide interesting results. In both languages the VS order is excluded in the relevant SNI focus contexts. When occurring, the VS order is restricted to syntactic-pragmatic conditions which are not observed in the parallel structure in languages like Italian (cf. Mioto (2003) for a parallel description of BP and Holmberg (2002) for Finnish). This suggests that the VS order produced in BP and in Finnish does not have the same kind of derivation proposed for the VS structures in languages like Italian (cf. Belletti (2004, 2005). Thus, our results provide further support to the analysis proposed in Belletti (2001, 2004) and, in particular, to the assumption that the VS strategy is related to the presence of a referential, but not expletive, pro in the relevant language (Belletti (2005)).

The paper is organized as follows: sections 1 and 2 outline the theoretical framework of our work, section 3 provides a brief introduction to the research which have been carried out on answering strategies and subject focalization as new information focus. Subsequently, section 4 is devoted to the relevant characteristics of subjects in Brazilian Portuguese and in Finnish, resumed in section 5 together with the research questions and in section 6 the experimental design used to collect the data is explicated. In section 7 data and results are discussed and finally section 8 concludes the paper.

1. Baselines of the theoretical framework
As introduced, the theoretical background of the present work about subject focalization in BP and in Finnish is within the cartographic framework. More specifically, we are taking into account two of the main contributions given under this approach.

The first one is the proposal that the left periphery of the clause is an articulated area composed by distinct functional heads and their corresponding projections. Rizzi (1997, 2001) has proposed the structure in (1) for the complementizer system based on the interaction of different elements in the left periphery of Italian⁴³:

\[
\text{Notice that the structure in (1) concerns the matrix CP system. For embedded contexts the structure in (i) has been proposed (Rizzi 2001):}
\]

\[(i) \quad \text{Force (TOP*) INT (TOP*) FOC (TOP*) Wh (TOP*) ...}
\]

For the purposes of the present work we will deal only with the structure in (1).
Considering the CP system in (1) as divided into a fixed and an accessory component, we are dealing with the latter, in particular with the projection of the focus head. According to Rizzi (Rizzi 1997:288), this is activated when necessary, i.e. whenever a constituent has a focus feature to be satisfied by a Spec-head criterion.

Along the same lines comes the second contribution we are referring to: Belletti (2001 and subsequent works) identifies a vP periphery with a FocusP surrounded by Topic projections, in the spirit of the left periphery proposed by Rizzi, as exemplified in (2).

The structure in (2) accounts for the phenomenon of free inversion (henceforth FI) observed in languages such as Italian and illustrated in (3)a-b.

(3) a. Ha parlato Gianni
    has spoke Gianni
 b. E' partito Gianni
    has left Gianni
The postverbal subject in (3) can be interpreted in different ways depending on the context: as new information focus, (4), as contrastive focus, (5), or as topic, (6). Moreover, a postverbal subject is pragmatically correct also in all-new contexts, (7).

(4) a. Chi è partito / ha parlato?
   who has left / has spoken
b. E’ partito / ha parlato Gianni
   has left / has spoken Gianni

(5) a. Sara ha mangiato la mela.
   b. No, l’ha mangiata Lucia.
   No CL has eaten Lucia

(6) a. Che cosa ha poi fatto Gianni?
   What has then done Gianni
b. Ha (poi) parlato, Gianni
   has (then) spoken Gianni

(7) a. Che cosa è successo?
   what has happened
b. Ha telefonato Piero
   has telephoned Piero

Belletti’s work mainly concerns the subject as new information focus. She shows that in Italian the postverbal subject has a very low position in the clause as it always follows low adverbs such as completamente “completely”, bene “well”, and tutto “all” (cf. Cinque 1999).

(8) a. ?Capirà completamente Maria.
   understand-FUT.3sg completely Maria
b. ?Spiegherà completamente Maria al direttore.
   explain-FUT3sg completely Maria to the director
c. ?Capirà/ spiegherà bene Maria (al direttore).
   understand/explain-FUT3sg well Maria (to the director)
d. Capirà/ spiegherà tutto Maria (al direttore).44
   understand/explain-FUT3sg everything Maria (to the director)

(9) a. *Capirà/ spiegherà Maria completamente (al direttore).
   understand/explain-FUT3sg Maria completely (to the director)
 b. *Capirà/ spiegherà Maria bene (al direttore).
   understand/explain-FUT3sg Maria well (to the director)
c. *Capirà/ spiegherà Maria tutto (al direttore).
   understand/explain-FUT3sg Maria everything (to the director)

44 On the different grammaticality judgements for (3d) and (a,b,c) cf. Belletti (2004).
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One of the basic assumptions of the cartographic approach is that the interpretation of new information focus results from its being in the Spec position of a dedicated head, namely a Focus head. If the postverbal subject occurs very low in the linear order of the clause, then it should be in a low phrase internal focus position.

Assuming the vP periphery introduced in (10), Belletti (2001, 2004, 2005) proposes that in Italian a sentence with SNI, as in (4)b, has the structure in (11). The subject is in Spec,FocP in the vP periphery, the verb moves to a head higher than FocP and a pro satisfies the EPP requirement in the canonical preverbal subject position.

\[
\begin{align*}
(10) & \quad \text{[CP \ldots [TP \ldots [TopP \ldots [FocP \ Foc [TopP \ldots vP]]]]]} \\
(11) & \quad \text{[CP \ldots [TP pro... ha parlato \ldots [Top [FocP Gianni [TopP [vp\ldots]]]]]} 
\end{align*}
\]

A subsequent proposal (Belletti 2005) consists of the presence of a Big DP in which a subject and a pro are base-generated. The latter moves to the position in which it is assigned nominative case and the rest of the Big DP containing the subject moves to Spec,FocP in the vP periphery, as shown in (12).

\[
\begin{align*}
(12) & \quad \text{IP} \\
& \quad \text{pro,} \\
& \quad \text{verrà} \\
& \quad \text{TopP} \\
& \quad \text{Top'} \\
& \quad \text{Top° FocP} \\
& \quad \text{[t, [DP2 Gianni], Foc'} \\
& \quad \text{TopP} \\
& \quad \text{Top'} \\
& \quad \text{Top° vP} \\
& \quad \text{t, v'} \\
& \quad \text{tk} 
\end{align*}
\]

2. On pro and on the agreement with the postverbal subject

The approach in Belletti (2005) further assumes that the pro element involved in the inversion structures is referential and not expletive. Thus, it is proposed that pro shares the same features with the postverbal noun phrase. Consequently, if
pro has the same features of the noun phrase in the vP-peripheral focus position, the verbal agreement with the postverbal subject, as well as the nominative case assignment, follow from the presence of the referential pro in the canonical preverbal subject position.

Hence, the two important assumptions are: i) the movement of the postverbal subject to the Focus position of the vP periphery, and ii) the availability of a referential pro. Consequently, the focalization of the subject in a postverbal position is assumed not to take place in non null subject languages (NNSL), as showed in Belletti (2009). NNSL typically focalize the subject through two different structures: i) SV structures with a particular intonation on the subject, as in English (13)a-b, and ii) (reduced) cleft sentences, as in French (cf. (14)b).

(13) a. Who came?  
   b. John came

(14) a. Qui a parlé?  
   Who spoke?  
   b. C’est Jean.  
   ‘It’s Jean’

3. Previous studies on answering strategies and new information subjects

Previous empirical studies on the use of new information subjects have given inspiration to the present work. This section is devoted to their main results. As hinted in the Introduction, the task used in the present study was first created and used by Belletti & Leonini (2004). Their work on the interface between syntax and pragmatics concerns the use of new information subjects and in particular of the FI structure in the L2 Italian of 26 adult learners with different L1s. Moreover, also the use of null subjects in the target L2 language was observed. From the results the authors observe that these two linguistic phenomenon don’t seem to be correlated since the FI inversion is used to a minor extent with respect to null subjects, at least in the interlanguage grammar under discussion. Thus, a pro is licensed but the vP peripheral focus position, which is assumed to host the new information subject in null subject languages, is not (extensively) activated. It is argued that the interlanguage grammar has a difficulty at the interface level between the computational system and discourse, since the unavailability of FI could not be due to the unavailability of an expletive pro.

The second research has been done few years later by Belletti, Bennati & Sorace (2007). Taking as a starting point Belletti&Leonini’s (2004) findings, the study aimed at further restricting the investigation domain on the syntax of subjects in Italian L2 at a very high (near native, cf. White & Genesee 1996) level of attainment. It is observed that the unbalanced correlation between the use of postverbal new information subjects and the use of null subjects persist and it cannot be considered a developmental effect. At a near-native level null subjects
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are correctly used at a higher rate with respect to postverbal subjects. Hence, the results strengthen the previous important observation that the positive setting of the null subject parameter is a necessary but not sufficient condition for licensing postverbal subjects in L2 Italian.

4. Interest of the present study

The present study shows data coming from the Brazilian Portuguese and Finnish adaptations of the test. Differently from the previous studies, it does not deal with acquisition issues but focuses on data coming from native speakers of the two languages. The main contribution comes from the nature of BP and Finnish as partial null subject languages (PNSL) and to the consequent use of different structures available in these languages in answers with the subject interpreted as new information focus. Before presenting the experimental design we will briefly introduce the main facts about BP and Finnish as for their PNSL nature.

4.1 Overview on null/overt subjects in Brazilian Portuguese

The weakening of verbal morphology in Brazilian Portuguese has led this language to the loss of referential null subjects\(^{45}\). However, there are two types of referential null subjects which are still widely used. The first is the null subject in matrix clauses illustrated in (15). The second is the embedded null subject coreferent with the subject in the matrix clause, as illustrated in (16).

(15) Comprei um carro novo ontem.
    bought-PAST1sg a new car yesterday
    ‘I bought a new car yesterday.’

(16) João, disse que \(ec\) comprou um carro novo.
    John, say-PAST3sg that \(ec\) buy-PAST3sg a new car
    ‘John said that he bought a new car.’

More detailed studies have pointed out that these subject omissions have some peculiarities which are not found in null subject languages. As noticed by Figueiredo-Silva (1996) e Rodrigues (2002), null subjects in matrix clauses like (15) are restricted to the first position in the clause and must refer to an element contained in the previous discourse. The restriction to the first position can be illustrated through the examples \(a\) in (17)-(19), in which the subject is preceded by a \(wh\)-element, a contrastive focus and a topic, respectively. In order to be grammatical, these sentences must have a full pronoun, as shown in the examples \(b\)\(^{46}\).

(17) \(a\) *O que (que) \(ec\) comprei ontem?
    ‘What *\(ec/I\) have bought yesterday?’

\(b\) O que (que) eu comprei ontem?
    ‘What \(I\) have bought yesterday?’

\(45\) There is a wide literature concerning the loss of referential null subjects in BP as well as its correlation with the reduction of the inflectional paradigm. See the diachronic studies by Duarte (1996), the work by Figueiredo-Silva (1996) and the papers in Kato & Negrão (2000), among others.

\(46\) Examples extracted from Figueiredo-Silva (1996) and Rodrigues (2002).
(18)  a.*O VINHO *ec vai trazer (nao a sobremesa).
    b. O VINHO ele vai trazer (-nao sobremesa).
    ‘The wine *ec/he will bring (not the dessert).’

(19)  a.*O João, *ec acho que vai ser despedido.
    b. O João, eu acho que vai ser despedido.
    ‘The John, *ec/I think that will be fired’

As pointed out by Rodrigues (2002), this restriction in the use of the matrix null subject is a peculiarity of contemporary PB. According to the author, in vernacular theatre pieces it is possible to find null subjects together with a *wh*-element, (20)a, or a topic, (20)b.

(20)  a. E o que *ec direi da menina?
    and what *ec say-FUT1sg of the girl?
    ‘And what will I say about the girl?’
    b. Mas, olha, o meu vestido está quase pronto, e o teu, *ec nao sei quando estará.
    But look my dress is almost ready, and yours, *ec don’t know when it will be.

    (Rodrigues (2002) examples 10-11, p. 163)

    As for the embedded null subject illustrated in (16), one of its main characteristics in contrast to null subjects in *pro*-drop languages is that it must have an antecedent located in a higher clause. Sentences like those illustrated in (21), where there is no antecedent for the embedded null subject, are ungrammatical in BP

(21)  a.*A Mariai disse que *ecj canto bem.
    Mariai said that *ecj sing well
    ‘Maria said that I sing well.’ (Figueiredo-Silva, example 28, p. 133)
    b. *pro-expl parece que *ec tinha telefonado.
    *pro-expl seems that *ec has called
    ‘It seems that she has called.’ (Rodrigues (2002) example 19, p. 165)

The peculiar behaviour of the null subjects illustrated in (12) and (13) has led some researchers to hypothesize that these subject omissions are not genuine null pronouns. Consequently, a new branch of research started in order to identify which grammatical properties could determine their existence.

Regarding null subjects in matrix clauses, the fact that it is restricted to the first position and must refer to an element salient in the discourse has led some scholars (cf. Figueiredo-Silva (1996), Rodrigues (2002) and Modesto (2008)) to interpret it as an instance of *Topic Drop*, a phenomenon found in languages like German. As for the null subject in the embedded clause in (13), on the other hand, different analyses have been proposed in order to explain its nature (cf. Figueiredo-Silva (1996); Rodrigues (2002), Ferreira (2004), Guesser

47 For a detailed discussion about the properties of embedded null subjects in Brazilian Portuguese, see Rodrigues (2002), Ferreira (2004) and Guesser (2007a).
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(2007, 2007a)). Even though we will not discuss in detail these analysis, it is important to notice that all they all agree on the fact that the omission of subjects in embedded contexts in BP is due to grammatical properties different from those assumed to be involved in the licensing and identification of null subjects in pro-drop languages (cf. Rizzi (1984) and subsequent work).

To conclude, null referential subjects are not allowed in contemporary BP. Null expletives and arbitrary null subjects are widely used, as illustrated in (19), even they can be full in some cases as shown by the examples in (23)a-b, extracted from Duarte (1999), where the expletive null subject can alternate with a demonstrative pronoun (for a more detailed discussion on the different strategies exploited to fulfil the non-referential subject position, see Duarte (1999)).

(22) a. Choveu a noite inteira.
   rain-PAST3sg the all night
   ‘It rained the whole night’

b. Não usa mais chapéu.
   not use-PRES3sg anymore hat
   ‘(people) don’t use anymore hats’

c. Parece que João passou por aqui
   seem-PRES3sg that J. pass-PAST3sg for here
   ‘It seems that João was here’

(23) a. proexpl era em torno de dez pessoas.
   be-PAST3sg about of ten persons
   ‘There were about ten persons’

b. Isso era em torno de dez pessoas.
   this be-PAST3sg about ten persons
   ‘It was around ten persons’

4.2 Overview on null/overt subjects in Finnish
Finnish allows null subject for first and second person singular and plural, but not for third. Observe the paradigm in (24):

(24) a. (minä) tule-n
   (I) come-PRES1sg

b. (sinä) tule-t
   (you) come-PRES2sg

c. hän tule-e
   (s)he come-PRES3sg

d. (me) tule-mme
   (we) come-PRES1pl

e. (te) tule-tte
   (you) come-PRES2pl

f. he tule-vat
   they come-PRES3pl

Notice that the optionality of an overt 1st or 2nd person subject might be apparent: the use of an overt pronoun is often interpreted as stressed. There exists however a difference between standard and colloquial Finnish: in
colloquial Finnish a shortened pronominal form is commonly used and stress is not involved\(^{48}\). Nonetheless, 3\(^{rd}\) person null subjects are allowed under special circumstances:

(i) in subordinate clauses when the subject is co-referential with the subject of the main clause, observe the different interpretation between the null subject in (25)a and the overt one in (25)b:

(25) a. Jussi sanoi, että __ soittaa myöhemin
   Jussi-NOMsg say-PAST3sg that __ call-PRES3sg later
   ‘Jussi said that he will call later’

b. Jussi sanoi, että hän soittaa myöhemin.
   Jussi-NOMsg say-PAST3sg that he-NOM call-PRES3sg later
   ‘Jussi said that he will call later’

(ii) in generic sentences when the 3\(^{rd}\) person null subject is referring to a generic ‘one’:

(26) Jussin vaimosta oli mukavaa, että hän __ pääsi aikaisin töistä.
   Jussi GEN wife-ELA was nice-PART that (s)he-NOM came early job-ELA
   (adapted from Holmberg 2005)

Finally, a null expletive pronoun is found in extraposed clauses, (28)a and with weather verbs, (28)b. Notice that in colloquial Finnish the expletive pronoun can be optionally overt in both cases. In the extraposed sentence it is considered referential whereas with weather verbs it is often referred to as a quasi-argumental or quasi-referential expletive (Holmberg & Nikanne 2002).

(28) a. __ oli kiva, että soitit.
    be-PAST3sg nice that call-PAST2sg
    ‘It was nice that you called’

b. __ sataa.
    rain-PRES3sg
    ‘It rains’

The observation which follows from the examples above is that Finnish has both an embedded null subject and a null generic subject, as first observed by Holmberg (2005). Interestingly, Finnish besides having null subjects also has an

\(^{48}\) We are referring to the colloquial variety spoken in the Southern part of Finland around Helsinki. Here, a non overt pronoun would not be the preferred choice following native speakers’ judgements. Further research on the topic is needed in order to define its status as for the pro-drop parameter.

(i) mä tuun huomenna colloquial
(ii) (minä) tulen huomenna standard
‘I come tomorrow’
A comparative view on answering strategies and new information subjects

overt expletive pronoun sitä⁴⁹ (cf. Holmberg & Nikanne 2002, Holmberg 2005). This expletive is observed in the colloquial register.

(29) Sitä viihtyy saunassa
(from Holmberg 2005)
   sitä-EXPL feel-good sauna-INEsg
   ‘One feels good in sauna’

The use of the expletive pronoun sitä in (29) is related to the well-known characteristic that Finnish does not allow verb initial sentences when the sentence is impersonal or when there is a potential topic that can appear sentence-initially⁵⁰. Hence, the possible ways to recover (30) are shown in (30)b-c-d.

(30) a. *puhui Jussi eilen kokouksessa
   speak-PAST3sg Jussi-NOM yesterday meeting-INE
   ‘Jussi spoke at the meeting yesterday’
 b. kokouksessa puhui Jussi
   meeting-INE speak-PAST3sg Jussi-NOM
 c. eilen puhui Jussi
   yesterday speak-PAST3sg Jussi-NOM
 d. Jussi puhui kokouksessa
   Jussi-NOM speak-PAST3sg meeting-INE

Impersonal verb initial sentences can also be recovered through an expletive (see also (29)):

(31) a. *leikkii lapsia kadulla
   (from Holmberg & Nikanne 2002)
   play-PRES3sg children-PARTpl street-ADE
 b. sitä leikkii lapsia pihalla
   sitä-EXPL play-PRES3sg children street-ADE
   ‘There are children playing in the street’

Interestingly, in the collected data we observe instances of 3rd person verb initial sentences with a referential null subject, as exemplified in (32). Such kind of sentences are generally considered ungrammatical in standard Finnish and by prescriptive grammars. The fact seems similar to the lack of subjects in first position interpreted as topic drop in BP.

(32) a. Mitä hän oli tekemässä?
   What (s)he was doing?

⁴⁹ Sitä is the partitive case of the demonstrative pronoun se ‘this/it’.
⁵⁰ This characteristic has been interpreted as a consequence of the assumption that Finnish is a topic-prominent language: the external argument can be any category that can be the topic of the sentence and consequently the EPP can be satisfied by any category that can function as the topic of the sentence (Holmberg & Nikanne 2002). Holmberg & Nikanne (2002) also discuss the grammaticality of some verb initial sentences.
b.  leikkasi peukaloa
   cut finger
   ‘She was cutting her finger’

To conclude this overview, we have observed that Finnish is a partial null subject language in the sense that it allows 1\textsuperscript{st} and 2\textsuperscript{nd} person null subjects but it doesn’t allow 3\textsuperscript{rd} person null subjects nor verb initial sentences, when in 3\textsuperscript{rd} person. Moreover, it has an expletive which can be used in subjectless constructions, such as expressions with non-referential subjects (extraposed clauses, weather verbs, impersonal sentences). We are not dealing any longer with the nature of this expletive pronoun\textsuperscript{51}, the interested reader is sent to Holmberg & Nikanne (2002), (2008), Holmberg (2005), for extensive discussion.

5. Interim summary and research questions
We summarize in Table 1 the main characteristics observed for null subjects in BP and Finnish:

<table>
<thead>
<tr>
<th></th>
<th>BP</th>
<th>Finnish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Null subject in finite clauses</td>
<td>*</td>
<td>Only for 1\textsuperscript{st} and 2\textsuperscript{nd} persons</td>
</tr>
<tr>
<td>Null subject in embedded clause when co-referent with an argument in the matrix clause</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Non-referential null subject</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Overt expletive pronoun</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

Table 1

Holmberg et al. (2009), in their recent discussion about the null subject parameter, identify three properties that characterize a language as a PNS language. According to these authors, in PNS languages subject omissions are allowed under 3 conditions:

- when the subject is non-thematic
- when the subject is a generic pronoun corresponding to English ‘one’
- when the subject is controlled by an argument in a higher clause

As we can observe from the description about null subjects in BP and Finnish, summarized in Table 1, both languages follow the criteria established by Holmberg et al. (2009), and can thus be classified as PNSLs.

\textsuperscript{51} If standard and colloquial Finnish would be considered as distinct grammars it would not be surprising, under the theoretical framework assumed here, that colloquial Finnish (the Southern variety around Helsinki) is non pro-drop and has an expletive.
A comparative view on answering strategies and new information subjects

On the basis of the partial null subject nature of BP and Finnish described above, the questions to which the present study aims at answering are the followings:

(i) Do PNSL such as Brazilian Portuguese and Finnish show VS structures in answers with subject
as new information (SNI)?

(ii) Which other strategies, if any, native speakers resort to in SNI contexts?

6. Answering strategies in SNI contexts: the experimental design

The experimental task used in the study of new information subject focalization in BP and in Finnish was created by Belletti & Leonini (2004) and successively also used in Belletti, Bennati & Sorace (2007). It consists in an elicitation task which present 22 short videos with female and male actors. The original language of the video task is Italian and it has been doubled in BP and Finnish by native speakers of the two languages. Each video shows a scene in which one of the actors asks a question about it and the participant has to answer orally to the question in the most spontaneous way. Afterwards, one to three recorded questions were presented to the participant. The test also included filler questions. Each subject was tested individually and recorded. The answers were transcribed and only sentences containing a verb were considered. The verbs were classified in transitives, unergatives and unaccusatives. The participants were all adult native speakers of BP (n=20) and Finnish (=15).

Finally, notice that using the same experimental design has been important for ensuring us with the same discourse-pragmatic contexts in which subjects are effectively focalized as new information.

7. Results and discussion

In this section we will present the results for BP and Finnish, respectively. We will consider the kind of strategies used in SNI information contexts, the occurrence of VS order and finally, the kind of structures in which the focalized subject can appear in a postverbal position.

7.1 Brazilian Portuguese

The answers to the target items can be divided into six types as exemplified in (33)-(38).

(33)  a. Quem respondeu o telefone?
      SV
      ‘Who answered the phone?’

      b. A Clara respondeu ao telefone.
      the Clara answered to the phone
      ‘Clara answered the phone’

(34)  a. Quem chegou?
      VS
      ‘Who arrived?’
b. Chegou um homem.
   ‘A man arrived’

(35) a. Quem deixou a televisão ligada?
   CLEFT
   ‘Who has left on the television?’
   b. Foi a Maria que deixou a televisão ligada.
   was the Clara that left television on
   ‘It was Clara who has left the TV on’

(36) a. Quem telefonou?
   REDUCED CLEFT
   ‘Who called’
   b. Foi a Elisa.
   was the Elisa
   ‘It was Elisa’

(37) a. Quem comeu a maçã?
   PSEUDO CLEFT
   ‘Who ate the apple?’
   b. Quem comeu a maçã foi uma senhora.
   who ate the apple was a woman
   ‘It was a woman who ate the apple’

(38) a. Quem varreu o chão?
   TRUNCATED CLEFT
   who swept the ground?
   b. A menina que varreu o chão.
   the girl that swept the ground
   ‘It was the girl who swept the ground’

The results are shown in Graph 1. Two main answering strategies stand out: SV (37.7%) and Pseudo-Cleft (31.6%). Other strategies include Cleft, Reduced Cleft, Truncated Cleft and to a minor extent passive sentences.
Graph 1: Strategies of subject focalization in BP

Summing the different types of cleft structures (35)-(38) we obtain the picture in Graph 2:

Graph 2: Distribution of cleft sentences in the data.

7.1.1 VS structures

In Table 2 we report the numerical data of the different answering strategies according to the verb class.

<table>
<thead>
<tr>
<th>Verb</th>
<th>SV</th>
<th>VS</th>
<th>Cleft</th>
<th>R.Cleft</th>
<th>P.Cleft</th>
<th>T.Cleft</th>
<th>Passive</th>
<th>Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans.</td>
<td>36,7%</td>
<td>4,8%</td>
<td>6,7%</td>
<td>6,7%</td>
<td>33,3%</td>
<td>4,8%</td>
<td>6,1%</td>
<td>313</td>
</tr>
<tr>
<td></td>
<td>115</td>
<td>15</td>
<td>24</td>
<td>21</td>
<td>104</td>
<td>15</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Unacc.</td>
<td>41,7%</td>
<td>15,6%</td>
<td>9,4%</td>
<td>9,4%</td>
<td>20,8%</td>
<td>3,1%</td>
<td>0%</td>
<td>96</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>15</td>
<td>9</td>
<td>9</td>
<td>20</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Unerg.</td>
<td>37,1%</td>
<td>8,3%</td>
<td>6,1%</td>
<td>7,6%</td>
<td>35,6%</td>
<td>3,8%</td>
<td>1,5%</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>11</td>
<td>8</td>
<td>10</td>
<td>47</td>
<td>5</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Total amount of answers/BP
The data in Table 2 show that VS structures are displayed across all verb classes, even if at a low rate. Having a closer look to the individual data we observe that it is only one experimental subject (S8) who produces the majority of VS structures (25/41). Examples are given in (39)-(42) for all verb classes.

(39)  a. Quem tossiu?
    who coughed
    b. Tossiu a senhora de camisa amarela [...] 
    coughed the woman with yellow shirt

(40)  a. Quem abriu a janela?
    who opened the window
    b. Abriu a janela a menina de blusa preta e saia azul.
    opened the window the girl with black shirt and blue skirt

(41)  a. Quem jogou as flores fora?
    who threw the flowers away
    b. Jogou as flores fora a senhora de blusa vermelha, de blusa amarela.
    threw the flowers away the woman with red shirt, yellow shirt

(42)  a. Quem se levantou nessa cena?
    who stood up in this scene
    b. Se levantou nessa cena o senhor Giusepe [...] 
    stood up in this scene Giuseppe

We can interpret these cases as topicalization of the VO chunk. That this analysis can be on the right track is suggested by the production of VOS structures like those in (40) and (41), which are possible only in cases of topicalization of the VO chunk (cf. Mioto (2003), Quarezemin (2005) and Guesser (2007) for further discussion on BP data). A similar situation is found in Italian, as pointed out by Belletti (2004) (cf. 43b)52.

(43)  a. Chi capirà il problema?
    who understand-FUT3sg the problem
    b. ??Capirà il problema Gianni.
    Understand-FUT3sg the problem Gianni

Hence, excluding the data of subject S8, the results for VS order in subject focalization showed in Table 2 are represented in Table 3:

52 The VS order with transitive verbs becomes acceptable when the object is cliticized, as in (i), or when it contains the quantifier tutto ‘all’, as in (ii).
(i) Lo capirà Gianni
(ii) Capirà tutto Maria
On the acceptability of this kind of sentences versus the marginality of sentences such as (43)b, see Belletti (2001, 2004).
A comparative view on answering strategies and new information subjects

<table>
<thead>
<tr>
<th>Verb</th>
<th>SV</th>
<th>VS</th>
<th>O(DP)VS</th>
<th>O(pr)VS</th>
<th>SO(pr)V</th>
<th>Cleft</th>
<th>R. Cleft</th>
<th>Loc/cleft</th>
<th>Tot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trans.</td>
<td>82%</td>
<td>0%</td>
<td>2%</td>
<td>8%</td>
<td>0.3%</td>
<td>3.8%</td>
<td>4.2%</td>
<td>0%</td>
<td>287</td>
</tr>
<tr>
<td>Unacc.</td>
<td>88%</td>
<td>7%</td>
<td>0%</td>
<td>0%</td>
<td>0.0%</td>
<td>2.3%</td>
<td>2.3%</td>
<td>0%</td>
<td>43</td>
</tr>
<tr>
<td>Unerg.</td>
<td>84%</td>
<td>4.6%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>3.9%</td>
<td>3.9%</td>
<td>2.6%</td>
<td>152</td>
</tr>
</tbody>
</table>

Table 3: VS order for verb class

It is worth noticing that VS structures are almost all restricted to unaccusative verbs. Below are shown some examples of this type of answers, directly drawn from the corpus.

(44) a. Quem chegou?
    who has answered?
    b. Chegou um homem.
    arrived a man

(45) a. Quem saiu?
    who went out
    b. Saiu um rapaz.
    went out a boy

7.2 Results: Finnish
As is shown from Graph 3 and Table 3, the preferred answering strategy in the Finnish data is overwhelmingly SV(O).

Graph 3: Strategies of subject focalization in Finnish

Table 4: Total amount of answers/Finnish
Nonetheless, other types of answers are not excluded. In particular an O/Adv VS order is available, where O/Adv is the topic/known information and S is new information focus. The clause-initial direct object is generally a pronoun which is co-referent with the DP in the question. Other strategies include clefts, reduced clefts and locative clefts. The answer types are exemplified in (46)-(51):

(46) a. Kuka tuli?
   SV(O)
   ‘Who came?’

b. Sakari tuli
   Sakari come-PAST3sg

(47) a. Kuka söi omenan?
   OVS
   ‘Who ate the apple’?

b. omenan söi vaalea nainen
   apple-ACCsg eat-PAST3sg blond woman-NOMsg
   ‘The blond woman ate the apple’

(48) a. Kuka puhui videossa?
   AdvVS
   ‘Who spoke in the video?’

b. videossa puhui se poika
   video-INE speak-PAST3sg that boy-NOMsg
   ‘In the video spoke that boy’

(49) a. Kuka vastasi?
   CLEFT
   ‘Who answered?’

b. Se oli tuo tyttö, joka vastasi
   it was that girl-NOMsg who-NOMsg answered

(50) a. Kuka soitti?
   REDUCED CLEFT
   ’Who called?’

b. Se oli Kaisa
   it was Kaisa-NOM

(51) a. Kuka on lakaisut?
   LOCATIVE/CLEFT
   ’Who has swept?’

b. Siinä oli yksi tyttö, joka lakaisi
   there was one girl who swept
7.2.1 (O)VS structures
From Graph 3 it emerges that in Finnish the VS order, which is typical of null subject languages such as Italian in *Errore. L’origine riferimento non è stata trovata*, is excluded in the relevant SNI focus contexts. Notice that VS can be licensed only when there is a phonetically expressed topic/known information in the preverbal sentence-initial position, e.g. a direct object with transitive verbs, (52), or an adverbial with unergative and unaccusative verbs, (53). As is evident from Graph 3 and Table 3, the verb class is not relevant for the (O/Adv)VS order.

(52) a. Kuka söi omenan?
    who ate the apple?
b. Sen söi vaalea nainen.
    it-ACC eat-PAST3sg blond-NOMsg woman-NOMsg
    ‘A blond woman ate it’

(53) a. Kuka puhui videossa?
    who spoke in the video?
b. Videossa puhui se poika
    video-INesg speak-PAST3sg that-NOMsg boy-NOMsg
    ‘In the video spoke that boy’

The OVS order is attested in the 10% (28/287) of the total amount of answers with transitive verbs and in the 5.1% with unergative and unaccusative verbs. At the discourse level, OVS is possible when O is a topic in the sense of known/given information and S new information (cf. Vilkuna 1995, Holmberg 2002). Syntactically, two derivations seem to be possible: i) parallel to V2 languages, and ii) OV is first obtained by topicalization of the object in the low part of the clause and then the OV chunk is fronted into the left periphery, as exemplified in (54) and (55), respectively. The exact reason for the first low topicalization in (55) is unclear and needs further investigation. Notice however, that also the intermediate step SOV is a possible order in SNI contexts and that whenever the object undergoes leftward movement it can only be interpreted as known (topic).

(54) \[ \text{CP O1 V2 [TP S3 [t1 t2 t3]]} \]

(55) \[ \text{CP [OV1] [TP S [...t1...]]} \]

In line with recent literature (cf. Holmberg 2002) we assume that a contrastively focalized subject moves to CP to check some focus features. Recall that in the present data the subject is new information focus in all answer contexts. We propose that when the subject is new information focus it remains in situ, independently of the linear order, parallel to non null subject languages as English, which however doesn’t allow the free constituent order typical to Finnish.

As a consequence, in the SOV and SVO linear orders observed at a low rate in the elicited production data, in which the subject can be interpreted as
contrastive focus or new information focus, the subject moves to CP in the former case and stays in situ in the latter

8. Discussion
The data collected in the present study shows two main results: on the one hand BP allows various answering strategies in the relevant SNI contexts. In particular, two strategies outstand: SV strategy and cleft strategies. On the other hand, Finnish data show that the preferred answering strategy is overwhelmingly SV, even though other strategies like the O/AdvVS order, clefts and reduced clefts are also displayed.

8.1.1 SV and VS strategies
As for SV strategies we assume that in both languages the SV order is an instance of in situ focalization, along the lines of Belletti (2008, 2009). Thus, under this analysis, the new information subject in the canonical SV(O) order, as in (56)b and (57)b for BP and Finnish respectively, would have the derivation in (58), where the peculiar intonation together with the interpretation of the subject are a consequence of the activation of a DP-internal focus projection.

(56) a. Quem comprou o livro?
   ‘Who bought the book?’
   b. A Maria comprou o livro.
   ‘Mary bought the book’

(57) a. Kuka osti kirjan?
   ‘Who bought the book?’
   b. Maria osti kirjan
   ‘Mary bought the book’

(58) \[
[CP [IP A Maria/Maria 1° comprou/osti \[vP… o livro/kirjan\] \]]]
\[
S \quad V \quad O
\]

As far as Finnish is concerned, this analysis further refines the mapping of the functional projections proposed by Holmberg & Nikanne (2002) referring in particular to focalized elements. As we can see from the structure in (59), Holmberg & Nikanne propose that (i) in Finnish the contrastively focalized constituents are located in Spec,CP, (ii) that Spec,FP hosts subjects and non-subject topics, and F° hosts finite V, and (iii) that TP hosts “information focus”/non-contrastive arguments (in the sense of Vallduvi & Engdahl 1996).
A comparative view on answering strategies and new information subjects

Even though we adopt in principle this analysis, our approach aims at implementing it as far as it concerns new information focus constituents. More specifically, we assume that in Finnish a new information focalized subject is always focalized \textit{in situ}, as schematized in (58). In addition, the assumption of the \textit{in situ} focalization process also accounts for the O/AdvVS strategies observed in (52) and (53) and represented in (60) as an alternative to (61) proposed by Holmberg & Nikanne (2002):

\begin{equation}
(60) \left[ CP \left[ FP \left[ NegP \left[ TP (TenseP) \right] \right] \right] \right]
\end{equation}

\begin{equation}
(61) \begin{array}{l}
a. \text{Tämän kirjan on kirjoittanut Graham Greene.} \\
\quad \text{this-ACC book-ACC has written Graham-NOM} \\
\quad \text{Greene-NOM}
\end{array}
\end{equation}

Under the analysis in (58), we observe that BP and Finnish are similar for the fact that both make use of \textit{in situ} focalization for subjects of new information. On the other hand, the two languages differentiate for the VS order: in Finnish it is never allowed but BP can make use of this strategy. As discussed in § 7.1.1, this strategy is mainly restricted to unaccusative verbs\textsuperscript{53}.

As well known, unaccusative verbs have a special status because they allow subject inversion also in contexts in which subject focalization or topicalization are not involved, differently from non-unaccusative verbs. As assumed in Burzio (1986) the occurrence of this kind of subject inversion is due to the property of licensing the subject in the object position, in which it is base-generated, as schematized in (62). In (62) the subject remains in the object position and forms a chain with an expletive \textit{pro} in the preverbal subject position to which nominative case is assigned. The chain between \textit{pro} and the

\textsuperscript{53} As we can see in Table 3, BP allows VS with unergative verbs, even if to a very limited extent. A possible explanation would be to assume that these VS occurrences result from VP topicalization, as was the case of VS structures with transitive verbs discussed in 7.1.1.
postverbal DP is thus responsible for the assignment of nominative case to the latter\(^{54}\).

\[(62) \quad [\text{IP pro expl} \quad [I \quad [\text{VP V NP}]]] \]

A frequently observed phenomenon with unaccusative VS order is the Definiteness Effect (cf. Belletti, 1988), as shown in (63) for English: in the SV order the subject can be definite or indefinite, whereas the postverbal subject is indefinite.

\[(63) \quad \begin{align*}
\text{a. There arose a storm here.} \\
\text{b. * There arose the storm here.} \\
\text{(Belletti 1988)}
\end{align*}\]

Notice that in Italian also a new information definite postverbal subject is possible, as in (64). This can be explained by the possibility of having the postverbal subject in the specifier position of the vP peripheral Focus projection as proposed in Belletti (2001, 2004, 2005) and previously illustrated. The crucial difference with the analysis assumed in (62) is that nominative case is assigned through the connection with a referential \textit{pro} in the canonical preverbal subject position. Hence, the two derivations are different and no definiteness effects is expected.

\[(64) \quad È \text{ arrivato il ragazzo.}
\text{is arrived the boy}\]

Summing up, in languages such as Italian VS order with unaccusative verbs can have two different derivations, as illustrated in (62) and (65). In (62) the subject is not contrastively focalized nor it is topicalized whereas in (65) the subject is interpreted as new information focus.

\[(65) \quad [\text{CP} \quad [\text{TP pro}_{ref} \ldots \text{è arrivato} \ldots \text{[Top} \quad \text{[FocP il ragazzo} \quad \text{[TopP} \quad \text{[vP} \ldots]))]]\]

In light of these analysis, notice that it is not possible to assume none of the analysis for the unaccusative VS structure with new information subjects in BP. On the one side, BP does not have a referential \textit{pro}, as discussed earlier, and hence cannot have the derivation in (65) proposed by Belletti (2001, 2004, 2005). On the other side, the unaccusative analysis proposed in (62) is not adequate because the focalized subject can also be definite, as in (66)b.

\[(66) \quad \begin{align*}
\text{a. Quem saiu?} \\
\text{who left?}
\end{align*}\]

\(^{54}\) Subsequently, different analysis have been proposed, cf. Belletti (1988) among others, who offers a different point of view regarding the Case assignment mechanism.
A comparative view on answering strategies and new information subjects

b. Saiu o seu namorado.
    left your boyfriend

Unaccusative verbs are characterized by an expletive pro in preverbal position. Hence, the proposal that we assume is the one originally discussed in Quarezemin (2005). According to her, in unaccusative VS structures containing a new information subject the expletive pro is involved. This pro is necessary to license the subject in the Spec,FocP of the vP periphery. The consequence is twofold: on the one hand we can explain the possibility of having new information postverbal subjects in unaccusative structures. On the other hand, we can account for the impossibility of having new information subjects in VS structures with transitive verbs in BP.

8.1.2 Cleft structures

Cleft structures in BP and in Finnish would merit a deeper discussion which is beyond the scope of this paper. In the present work, we propose that the cleft structures with new information subjects can be analyzed as in (67), along the lines of Belletti (2009, 2010)\textsuperscript{55}.

\begin{equation}
\begin{array}{l}
[\text{TP pro/se} \ldots T \ [\text{FocP} [\text{vP set/olla} \ [\text{CP Force} \ [\text{CP Pedro/Jussi} \ [\text{FinP que/joka} \ [\text{- telefonou/soitti}]])])]]
\end{array}
\end{equation}

In (67) we observe that:

- the copula selects a CP endowed with a [+ focus] feature;
- the CP complement is reduced, a small CP, whose higher position is FocusP (cf. Rizzi, 1997, 2001);
- the CP complement contains an EPP feature, which expresses a relation of predication between the subject in CP and the rest of clause that follows it. This position is also responsible for the impossibility of focalizing an object as new information (for further discussion cf. Belletti, 2009, 2010);
- the subject first moves from its external merge position in the embedded CP to the EPP position; afterwards, it moves to the Spec,FocP in the vP periphery of the copula\textsuperscript{56}.
- the copula moves to a higher functional head;
- the preverbal subject position is occupied by an expletive pro in BP and by the overt expletive se in Finnish.

\textsuperscript{55} For discussion on the syntax of cleft structures in BP cf. Mioto (2003), Resenes (2009), Guesser (2011) among others.

\textsuperscript{56} Belletti (2010) assumes that the cleft sentences with new information such as (67) involve the vP peripheral focus position, coherently with the relevant cartographic analysis on focalization in non-cleft sentences in languages like Italian (Rizzi 1997, Belletti 2001, 2004 and related works).
Reduced clefts (see examples (36) for BP and (50) for Finnish) result from leaving unpronounced the part of the sentence following the focalized subject, as illustrated in (68).

\[(68)\]  
\[
\begin{align*}
\text{a. } & [\text{TP null expl. foi [ FocP S [vP [CP EPP [FinP que [TP \ldots]]]]]]} \\
\text{BP} & \\
\text{b. } & [\text{TP se oli [ FocP S [vP [CP EPP [FinP joka [TP S\ldots]]]]]]} \\
\text{Finnish} & 
\end{align*}
\]

Other strategies in the cleft family which however are only observed in BP consist of truncated clefts (see example (38)) and pseudoclefts (see example (37)). For the first we assume the analysis in (69) with a further deletion of the copula. As far as pseudoclefts are concerned, we refer the interested reader to Mioto (2003, 2011), Resenes (2009, 2011) for discussion on the syntax of these structures. Here we assume, in the spirit of the analysis proposed for the clefts sentences, that the new information subject is interpreted in the Spec, FocusP of the vP periphery of the copula in the matrix clause, as exemplified in (70).

\[(69)\]  
\[
[\text{TP null expl. copula} [\text{FocP S [vP [CP EPP [FinP complementizer [TP \ldots]]]]]]]
\]

\[(70)\]  
\[
[\text{CP wh-clause}]_k \text{ copula } \ldots [\text{Foc } S_j [\ldots [\text{vP t}_i [\text{sc } t_j t_k]]]]
\]

9. Conclusion

The research aimed at observing the answering strategies adopted in contexts of new information subject focalization in BP and in Finnish. We first investigated the occurrences of null referential subjects in BP and in Finnish and we observed that both languages can be classified as partial null subject languages, in the sense of Holmberg (2009). Then, we analysed the data on subject focalization in light of the traditional theories on the null subject parameter and of the more recent analysis in the cartographic framework on subject focalization. In order to test the same discourse-pragmatic conditions in both languages, we used the same aural elicitation task adapted from Belletti & Leonini (2004), as described in § 6.

The data coming from BP and Finnish show that different answering strategies are possible in these languages, as discussed in § 7. The main answering strategies available in these languages are SV and cleft strategies for BP and SV for Finnish. For both languages the SV strategy has been analysed as an instance of in situ focalization, parallel to what happens in non null subject languages like English, along the lines of Belletti (2009).

As for VS strategies, we observed that BP and Finnish differ. In Finnish, VS is only allowed with a preverbal object or adverbial, namely a topic. We analyse this kind of structure as involving the same focalization process assumed for SV structures: in situ focalization. On the other hand, in BP subject focalization through a VS strategy is restricted to unaccusative structures, which have been analysed as involving a subject in Spec,FocP in the vP periphery and an expletive pro in the preverbal subject position. Finally, the analysis for cleft
A comparative view on answering strategies and new information subjects

strategies share the basic assumptions that (i) the subject is focalized in the vP periphery of the copula and (ii) a referential pro is not involved. Hence, BP and Finnish do not show any instance of subject focalization through a VS strategy of the kind observed in Italian. When occurring, the VS order does not have the same kind of derivation proposed for VS structures in languages like Italian in the subject of new information contexts (Belletti 2001, 2004, 2005). This provides further support to the analysis proposed in Belletti (2001, 2004) and, in particular, to the assumption that the VS strategy is related to the presence of a referential pro in the relevant language (Belletti 2005).

References


Mioto, C. (2011) *Reduced pseudoclefts*. Presentation at the Brazilian-Italian Comparative Syntax, Semantics and Acquisition workshop, University of Siena, Italy.


The syntactic domain of number agreement: attraction effects and pronominal classes

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Assuming that agreement processes are the expression of morphosyntactic relations inside a dedicated projection (an Agr phrase), we examine the feature geometry involved in the construction of subject verb agreement relation. A production experiment was carried out in Italian using the attraction paradigm to investigate the various properties of Subject-Verb agreement when different elements occur in an intervening position between the subject and the verb. Attraction is manifested in Italian, and this occurs more frequently with prepositional phrases as intervener than with object clitics. Furthermore, the agreement configuration in the clitic condition in our experiment had a more complex structure, evidenced by the presence of many errors with all plural forms. The agreement domain of the clitic is sensitive to the nature of the pronoun and this can be seen by comparing different Romance languages. Pronouns have different agreement relations at the marking stage according to whether they are weak pronouns or clitics. The results of the study point to a more finely-tuned model of agreement in which the processing of agreement relations is subject to cross-linguistic variation, given the different types of pronoun found in natural languages.

1. Introduction
Agreement is a grammatical operation for establishing relations between elements in a sentence. A central issue in psycholinguistic models concerns the nature of this operation and the different levels of analysis involved. Most research on agreement has focused on the morphosyntactic expression of the number feature, which has two different aspects. One type of number information is notional, and concerns the number of entities in the representation, as in l’etichetta delle bottiglie (literally: ‘the label of the bottles’), which refers to more than one entity (labels) even though the plural is not grammatically expressed. The other is purely grammatical and concerns the relationships between words in a sentence. Efficient grammatical processing depends on these two steps being clearly distinct. Notional agreement may play
a role in providing an extra-grammatical strategy for establishing agreement, but this is probably only marginally related to syntactic agreement. Properties that are not strictly syntactic could be expected to disrupt the implementation of agreement but this is not sufficient to suppose that two mechanisms are simultaneously involved in the same operation.

In the present research we focus on the grammatical aspects of morphological agreement in terms of the different structural relations and the different properties of the elements involved in agreement. We are interested in seeing whether mechanisms of verbal agreement are sensitive to grammatical information.

One approach to exploring the factors involved in the AGREE operation is to manipulate the grammatical relationships between the elements in the syntactic configuration. Grammatical agreement in the sentence domain can be investigated using the so-called \textit{attraction} phenomenon (Bock and Miller, 1991), which occurs when an element intervening between two elements sharing an agreement relation and mismatched in the relevant features attracts agreement. This is simplified in the configuration in (1).

\begin{equation}
\text{[\ldots X, Singular \ldots] [\ldots Z, Plural \ldots] [\ldots Y, Singular \ldots]}
\end{equation}

\*The boat of the American soldiers leave in the fog

There is interesting evidence that there is an asymmetry between singular and plural: plural local nouns co-occurring with singular head nouns have been found to give rise to greater interference effects both in production errors (Bock and Miller, ibid) and in slower reading times in comprehension (Pearlmutter et al. 1999). These studies consistently show between 4% and 11% agreement errors in production in attraction configurations.

The phenomenon of “attraction” seems then to be asymmetric, which can be accounted for within a formalism that assumes syntactic features to be binary, possessing either a marked value of a given property, in this case (+ number), or an unmarked value (- number) (Jakobson, 1957). According to the “Marking and Morphing” model (Bock and Eberhard, 1993), the asymmetry arises at the morphological level, which is responsible for morphemic building of speech output, and is due to interference within a “reconciliation” process linking the marking stage, assumed to be notional in nature, and the lower-level Morphing stage\textsuperscript{57}.

A similar explanation for comprehension data has been put forward by Pearlmutter et al. (1999), who assumes that comprehension difficulties in sentences with singular head and plural local nouns arise from inadvertent head-overwriting on an on-the-fly NP number computation rather than from a backtracking mechanism, leading to speculation that number is syntactically considered only when a plural feature is encountered.

\textsuperscript{57} The fact that asymmetry between singular and plural has always been tested in this particular environment, where structural locality and linear precedence conflict, leaves open many possible explanations for the level of processing at which the feature asymmetry originates, in particular whether the need for notional assignment of number to phrases plays a role.
Interesting data have come from studies on the impact of syntactic factors on agreement errors using the attraction paradigm in English. Bock and Cutting (1992) observed that there are significantly fewer attraction effects in 2b than in 2a.

(2) a. [The editor of the history books] is/are…
   b. [The editor] who rejected the books is/are…

This experiment suggests that there is considerable processing difficulty in regulating the relations between elements which are structurally similar and are part of the same syntactic phrase, as in 2a, confirming the view that constituents are the relevant unit over which agreement takes place. In 2b, the intervening phrase, the books, is part of the relative clause. To understand all this, let’s suppose that the processor, having to proceed under time pressure and with strong working memory constraints, wants clear indication of the nature of the elements to link in a local relation. When linear and hierarchical orders conflict, the system is prone to error. These results can be interpreted as a consequence of minimality effects induced by the agreement feature of the intervening prepositional modifier, as schematized in (3).

(3) \[ \begin{array}{cccc}
X & \ldots & Z & \ldots & Y \\
[\ldots, \varphi_{\text{Singular}}] & [\ldots, \varphi_{\text{Plural}}] & [\ldots, \varphi_{\text{Singular}}] \\
\end{array} \]

It is reasonable to suppose that in a situation where the processing cost is high (maintaining two potential agreement relations before the verb form) the system is prone to error: A marked feature activates the agreement operation and attraction arises in a minimality environment.

There is evidence attesting to subject modifiers occasionally interfering with verb agreement when there is a number mismatch with the head noun. However, number features within the VP have rarely been studied. A recent study by Franck et al. (2007) on the structural properties of agreement revealed different effects with different syntactic relations. Attraction effects were investigated in French with two different classes of interveners: prepositional modifiers (4a) and clitic object pronouns (4b).

(4a) \[ \begin{array}{cccc}
\text{Subj} & \ldots & \text{N_{head}} & \ldots & \text{N_{mod}} & \ldots \\
\text{AgrS} \\
\end{array} \]
   Le professeur-SG des élèves-PL lit-SG/*lisent-PL
   \textit{The professor of the student reads/*read}

(4b) \[ \begin{array}{cccc}
\text{Subj} & \ldots & \text{N_{head}} & \ldots \\
\text{AgrOP N_{clitic}} & \text{AgrS} \\
\end{array} \]
   Le professeur-SG les-PL lit-SG/*lisent-PL
   \textit{The professor them reads/*read}

The main finding of this experiment was that there was a significantly greater number of attraction errors with clitics, as in 4b, than with prepositional modifiers, as in 4a. They put this down to differences in the structural relations involved, given that object clitics intervene not only linearly but also hierarchically as they are in an argument position. The study with French adults seems to indicate that the mechanism for implementing agreement is influenced
by the nature of the local constituents, with more attraction effects occurring with an object clitic intervener. It was also found that in the clitic condition plural head nouns generated more errors than singular head nouns, and plural intervening elements more than singular interveners. Other interesting data come from Spanish. Crucial for the present investigation, manipulation of clitic object pronouns does not give rise to attraction effects in Spanish (Anton-Mendez, 1996), where the local elements were object clitics marked for accusative case, a null-effect was found. Spanish differs from other Romance languages in that it lacks participial agreement and therefore the head for object agreement. The Spanish data indicate that differences between languages may be related to grammatical selection and that a non-active agreement position in a language could not induce attraction effects. A possible explanation for this is that the clitic itself is not relevant for attraction effects. In French, as in Italian but not Spanish, the clitic pronoun is an active element for agreement. This can be seen in past participle agreement with a preverbal object clitic.

(5a) Les pommes, je les ai mangé(e) 
(5b) Le mele le ho mangiato 
(5c) Las manzanas las he comido     [No Agr] 

The apples, I them have eaten

The absence of attraction effects with an object clitic in Spanish can be ascribed to the absence of a fully-fledged AgrOP intervening between the subject and the verb. The assumption behind this argument is that the object agreement phrase is the potential antecedent causing attraction effects, not the clitic element per se or the particular relations involved in cliticization.

1.1 The grammatical properties of subject-verb agreement

The agreement case studied here is Subject-Verb predication, which is governed by morphological variation related to syntactic and/or semantics factors. Subject-verb agreement for number can be modified according to:

i) the nature of the subject: phrasal subjects, as in (6), as opposed to non-phrasal subjects, as in (7). This is exemplified in the different implementations of agreement found with coordination (Heycock and Zamparelli, 2005; Picallo, 2002):

(6) Che sia partito tardi e che sia tornato presto è/*sono un fatto molto strano 
That he left late and came back early is/*are a strange thing
(7) Carla e Maria sono/*è buone compagne di viaggio 
Carla and Maria are/*is good travelling companions

ii) the nature of the predicate: distributive predicates, as in 9, as opposed to non-distributive predicates:

(8) I due ragazzi cantano e ballano 
The two boys sing and dance
The syntactic domain of number agreement

iii) subject position and its relationship to agreement, exemplified in the difference between preverbal (10) and postverbal subject agreement (11), or in terms of structural distance as in (12) and (13):

(10) Trois filles sont arrivées
(11) Il est arrivé trois filles
(12) The queen of England is you
(13) The queen of England may be you (from: Heycok and Kroch 1999)

The present research deals with the third point. We explore some of the properties related to structural distance and examine different intervening elements. Following Franck et al. (see (4)), we investigated the phenomenon of attraction by comparing linear intervention inside the same phrase, as in the classical attraction test with prepositional modifiers (14), with intervening elements such as object clitics (15), also linear interveners in subject-verb agreement.

(14) [ [Subj…Nhead…Nmod…] AgrS
      il professore-SG degli studenti-PL legge-SG/*leggono-PL
      The professor of the student reads/*read

(15) [ [Subj…Nhead…] [AgrOP PRO clitic] AgrS
      il professore-SG lePL legge-SG /*leggono-PL
      The professor them reads/*read

The aim of the study is first of all to explore the attraction paradigm in Italian and to see whether we can make finer distinctions in the grammatical elements involved. We are also interested in obtaining real-time processing data from different conditions in order to assess potential complexity effects involved, for example, in the object clitic condition.

Given that agreement is expressed differently across languages according to their grammatical properties, we stress the importance of cross-linguistics studies for a better understanding of the role of grammatical elements in the implementation of agreement. In particular, we expect a greater number of errors in the condition with object clitics, as in French, if c-command is the agreement domain. New data have the potential to open new discussions on the structural relations involved in attraction.

3. Methods

3.1 Participants
One hundred and five undergraduate students (88 female) participated in the experiment. Their mean age was 22.1 years, and their age range 20–35 years (standard deviation 2.03). They were all native Italian speakers with normal or corrected-to-normal vision.
3.2 Materials

50 pairs of items consisting of a NOUN having the function of subject and a VERB which can be either transitive or intransitive (e.g. massaggio-rilassare; massage-to relax) formed the basis of the experimental list. Each pair allowed for the insertion of a prepositional modifier, such as in (16) (PREP condition), and a clitic object pronoun, such as in (17) (CLIT condition). Verbs were always presented in non-finite form (in capital letters in the examples).

(16) Il massaggio dei fisioterapisti RILASSARE
    The massage of the physiotherapists TO RELAX

(17) Il massaggio li RILASSARE
    The massage them TO RELAX

To avoid facilitation due to repetition, all verbs and nouns (including nouns forming the prepositional modifiers) were used only once. Singular and plural forms of the subjects and prepositional modifiers/clitic pronouns were balanced in order to obtain 4 versions of each sentence: subject and prepositional modifier/clitic pronoun both singular (SS form), subject and prepositional modifier/clitic pronoun both plural (PP form), singular subject and plural prepositional modifier/clitic pronoun (SP form), and plural subject and singular prepositional modifier/clitic pronoun (PS form). Examples are given in Table 1.

Table 1
Examples of experimental items in the various conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Form</th>
<th>Example</th>
</tr>
</thead>
</table>
| PREP      | SS   | Il massaggio del fisioterapista RILASSARE  
             The massage of the physiotherapist TO RELAX |
|           | SP   | Il massaggio dei fisioterapisti RILASSARE  
             The massage of the physiotherapists TO RELAX |
|           | PP   | I massaggi dei fisioterapisti RILASSARE  
             The massages of the physiotherapists TO RELAX |
|           | PS   | I massaggi del fisioterapista RILASSARE  
             The massages of the physiotherapist TO RELAX |
| CLIT      | SS   | Il massaggio lo RILASSARE  
             The massage him TO RELAX |
|           | SP   | Il massaggio li RILASSARE  
             The massage them TO RELAX |
|           | PP   | I massaggi li RILASSARE  
             The massages them TO RELAX |
|           | PS   | I massaggi lo RILASSARE  
             The massages him TO RELAX |

In this way, a total of 400 items were created (50 NOUN-VERB pairs x 2 conditions x 4 forms). These were divided into eight lists in order to avoid repetition of a given NOUN-VERB pair. Each list contained 50 experimental
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items (6 of each kind, with a correction of two) and 50 filler items. 25 of which contained a prepositional modifier with an indeclinable noun, as in (18), and 25 contained a reflexive pronoun, as in (19).

(18) Il maglione di lana

*The sweater of wool*

INGERASSARE

TO GET FAT

(19) Il dottore si

*The doctor himself*

AMMALARE

TO BECOME SICK

3.3 Procedure

All participants were tested individually. They were presented with a short list of practice items before beginning the experiment in order to familiarize them with the task.

A fixation point appeared in the center of the screen for 1000 ms followed by the first part of each sentence for an interval of time varying with the length of the sentence in order to ensure consistent processing time (sentences with a prepositional modifier were always shorter than sentences with a clitic object pronoun). The interval was calculated with the variable Serial Visual Presentation (vSVP) formula \[(187 \text{ ms} \times \text{sentence word number}) + (27 \text{ ms} \times \text{sentence character number, including spaces})\] developed by Otten & Van Berkum (2008). Then the verb appeared and remained on the screen until the subject had verbally produced a singular or plural finite form of it. During the practice session participants were trained to pronounce each verb clearly, without hesitation, and, most importantly, without drawling the last part of the word (in Italian the verb ending provides number information). This procedure was adopted to ensure that sentence recognition was completed before participants started to say the verb, thus ensuring that the two tasks were not carried out simultaneously and that differences in speech onset times really reflected differences in processing cost. Once the verb form was spoken, an empty screen appeared for 500 ms before the fixation point reappeared (the procedure is schematized in Figure 1).

Sentences were presented randomly and each experimental session (Practice + Experimental Session) lasted approximately twenty minutes.

**Figure 1**

The different phases of the experiment are reported along the time-line.

Verbs production times were measured using a special microphone connected to E-Prime software. During each experimental session verbal responses were
registered with a second microphone connected to a second PC. This allowed us to verify verb form accuracy and the presence of hesitations.

3.4 Data analysis
Responses with hesitations or drawled endings were not included in the analyses. In addition, a threshold of three standard deviations was used to filter out production time outliers, and mean production times were computed only for correct singular or plural responses.

4. Results
A total of 205 (8.15%) errors in the prepositional modifier condition and 227 (8.98%) in the clitic object pronoun condition were produced. Error distribution is shown in Table 2.

Table 2
Raw data and % errors in the various experimental conditions

<table>
<thead>
<tr>
<th>Condition</th>
<th>Form</th>
<th>SS</th>
<th>SP</th>
<th>PP</th>
<th>PS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREP</td>
<td></td>
<td>26 (4.07%)</td>
<td>110 (17.55%)</td>
<td>23 (3.53%)</td>
<td>46 (7.45%)</td>
</tr>
<tr>
<td>CLIT</td>
<td></td>
<td>17 (2.58%)</td>
<td>68 (10.95%)</td>
<td>81 (12.75%)</td>
<td>61 (9.64%)</td>
</tr>
</tbody>
</table>

4.1 Production times
An ANOVA with production time as the dependent variable and the factors Condition with two levels (PREP vs. CLIT) and Form with four levels (SS, SP, PP and PS) did not show any significant effects.

4.2 Production accuracy
An ANOVA with production accuracy as the dependent variable and the factors Condition with two levels (PREP vs. CLIT) and Form with four levels (SS, SP, PP and PS) showed a significant effect of Form ($F_{3,312} = 24.75, p<0.001$). This reveals that participants were generally more accurate in producing the correct verb in SS sentences than in SP, PP and PS sentences (post-hoc Tukey test $p<0.001$), while their performance was less accurate in SP sentences than in the other sentence forms (post-hoc Tukey test $p<0.001$) (see Figure 2).
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Figure 2
Mean % accuracy with the various sentence forms (asterisks indicate significant post-hoc test results, * p≤0.001)

![Figure 2](image)

The Condition x Form interaction was also significant (F\(_{3,312}\) = 18.86, p<0.001). To understand this effect better, we conducted a separate ANOVA for each Condition with production accuracy as the dependent variable and the factor Form with four levels (SS, SP, PP and PS). A significant effect of FORM in the PREP Condition (F\(_{3,312}\) = 30.39, p<0.001) showed that participants were less accurate in producing verbs in the PREP SP condition than in the other PREP conditions (post-hoc Tukey test p<0.001) (see Figure 3), whereas a significant effect of Form in the CLIT Condition (F\(_{3,312}\) = 14.18, p<0.001) showed that participants were more accurate in producing verbs in CLIT SS sentences than in the other CLIT sentences (post-hoc Tukey test p<0.001) (see Figure 3).

Figure 3
Mean % accuracy with PREP forms (asterisks indicate significant post-hoc test results, * p≤0.001)

![Figure 3](image)
Finally, paired comparisons showed that there were no differences in accuracy between PREP SS and CLIT SS sentences and between PREP PS and CLIT PS sentences, but participants were more accurate in producing verbs in CLIT SP sentences than in PREP SP sentences (p<0.001), and in producing verbs in PREP PP sentences than in CLIT PP sentences (p<0.001) (see Figure 5).

5. Discussion
Our experiment using the attraction paradigm in Italian produced some very interesting data. Attraction, calculated as a significant difference between accuracy with the asymmetric form SP and the baseline (the symmetrical unmarked form SS), was measured in both prepositional and clitic conditions. Both SP forms differed from the baseline and this effect can be clearly seen in figures 3, 4 and 5. There were also slight differences between the clitic and
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prepositional conditions. Firstly, comparison of these two conditions in the asymmetric form (SP) showed there was greater accuracy, so less attraction, with a clitic intervener than with a prepositional intervener. Secondly, all forms in the clitic condition differed from the baseline (SS) but there were no significant differences between the PP, PS and SP forms. This pattern was not found with prepositional modifiers, showing their status to be different to that of clitics. In the following paragraph we discuss the two main aspects of the results.

5.1 The status of object clitics in Italian

Our initial hypothesis was that in Italian attraction effects in subject-verb agreement when the intervener is an object clitic should be more similar to the effects found in French than those in Spanish. This is because French and Italian have object agreement but Spanish doesn’t (see the examples in (5)). Instead, object clitics in our experiment with the attraction paradigm revealed a kind of intermediate pattern for Italian. More precisely, unlike Spanish, attraction occurs when a plural object clitic intervenes between a subject and the verb. However, comparison of the two conditions shows that in Italian, unlike in French, there is a less pronounced effect with object clitics than with prepositional modifiers. To understand this intermediate pattern in Italian better, it is necessary to adduce a new element into the discussion on grammatical agreement. An explanation needs to be found for the fact that we found fewer attraction effects with object clitics than with prepositional modifiers in Italian while Franck et al. found the opposite pattern in French. We take the view that cross-linguistic differences play an important role in agreement operations. The attraction paradigm is a useful instrument for testing subtle distinctions between languages in grammatical processing.

Romance languages have rich pronominal systems, which have been extensively investigated in linguistic theory (for an overview see Cardinalletti and Starke, 1999). Pronouns divide into three different classes according to their grammatical properties: clitics, weak pronouns and strong pronouns. These categories are fairly fluid and the number of pronouns in each class differs according to languages. Simplifying, clitics are nominal arguments closely linked with the verbal domain. In Italian, the pronominal argument moves to AgrO, the landing site for clitics, as a head, as illustrated in fig.2 (see Belletti, 1999 for all formal details).

Fig. 2

Belletti (ibidem) argues that the status of object clitics is different in French. In
particular, the pronominal object DP moves to the AgrO phrase as a maximal projection and not as a simple head. This is illustrated in figure 3 which shows a comparison of Italian (1) and French (2) object pronouns according to Belletti.

**Fig.3**

Belletti refers to cross-linguistic differences in the Romance languages in support of this analysis. For example, in non-finite constructions we find proclisis in French whereas in Italian we find enclisis of the pronoun, a closer relationship with the verb.

(20) *Les voir* proclisis in French
(21) *Vederle* enclisis in Italian

Kayne (1991) makes another interesting observation regarding French, which is that in particular contexts it is possible to disrupt the continuum between an object pronoun and the verb, as in (22).

(22) *Pour le bien faire* ...
...*en bien parler*  (Kayne,1991)

It is possible that French object clitics, being more similar to weak pronouns, have a different internal structure and hence give rise to more attraction errors. Absence of misanalysis in Italian is limited to the few instances of weak pronouns, that is, the dative pronoun *loro* (‘to them’).

In Italian, clitics differs from prepositional modifiers in that they are not DPs but simply nominal heads, hence they do not have the same structure as the agreement source, the subject DP. This can be seen in the data presented here. Clitics have a different structure to subjects and do not induce attraction in Italian.

(23) \[ X \ldots Z \ldots Y \]
\[ [...,-num]XP \quad [...] [+num]X^\circ/XP \quad [...] ,-num] \]

*Il professore li legge*

*The teacher them read*
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It is possible that French clitics are interpreted as DPs, hence of the same grammatical class as subjects, and it is therefore clear why they induce attraction effects. This does not happen in Italian where the principle of Minimality clearly distinguishes object clitics from subjects, which belong to different grammatical categories.

Fig. 9

This analysis is also supported by a recent study (Hamman and Belletti, 2008) on early and adult French L2 learners in which placement errors (pronouns produced in DP positions) were found and were put down to misclassification of the pronouns, which had been treated as weak. These errors were produced either in isolation, as in (24), after a preposition (25), or in canonical object position (26).

(24) E: c’est à moi, le.    Elisa 4;2 in isolation, with stress
   L: le quoi?  
   it’s to me, him/it/the
   the what?
   ‘it’s mine, that’ ‘which?’

(25) alors, tu joue avec le.                  Elisa 4;2 after a preposition (2 occurrences)
   so, you play with him/it
   ‘so, you are playing with it’

(26) non, on laisse le.                         Elisa 4;2 in canonical object position
   no, one leaves him
   ‘no, we leave him/it alone’

In French, as we have seen, it is possible that there is a phase during acquisition where subject and object pronouns are assigned the same structure. There is no evidence to support object clitics being weak pronouns in Italian.

A possible explanation for the misanalysis in French acquisition and for the clear attraction effects found uniquely in French, is the presence of a richer system of weak pronouns, which is not the case in Italian.

According to our initial hypothesis, subject-verb agreement should be
implemented similarly in Italian and French in the condition with a clitic intervener. We now have to reconsider this hypothesis and add a new level to the analysis of this pronominal category.

As table 3 shows, object pronouns have a different status in French and in Italian, which accounts for greater attraction effects in French.

<table>
<thead>
<tr>
<th>Tab. 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AgrPstPrt</td>
</tr>
<tr>
<td>ITALIAN</td>
</tr>
<tr>
<td>FRENCH</td>
</tr>
<tr>
<td>SPANISH</td>
</tr>
</tbody>
</table>

In Italian, on the other hand, there is no proximity between the clitic, an X°, and the subject, an XP, as illustrated in 27.

(27) X ... Z ... Y  
L’arbitro li fischia

5.2 Classification of pronouns

Like French, clitics in Italian appear to have a stronger disruptive effect in subject-verb agreement. Italian does not seem to display asymmetrical interference and when either or both subject and object clitics are plural in Italian there is the same low degree of interference. Clitics have a different mechanism related to their specific status. Many errors have also been found with PP forms in French (Franck et al., 2006) and in German (Hemforth et al., 2003). It is not clear, given that both elements bear a marked + number feature, why the verb can appear in a singular form. Fortunately, qualitative analysis of the errors throws some light on this apparently unclear situation. In four cases we found with clitics in PP form a person mistake, so an insertion of a new subject as in (28).

(28) I giocatori li canto The player them I sing

(29) X ... Z ... <pro> Y  
[...[+gen, +num, 3°pers]]Xp [...[+gen, +num, 3°pers]]X° [...[-num, 1°pers]]
The players them I sing

In a generic experimental task without a preamble, as the one described in methods section, the clitic must search for a suitable referent to be integrated in the sentence. If subject and clitic have the same features (number and gender) this is a clear indication to reanalyze the first noun as a topic object rather than a subject and to insert pro in order to establish the necessary subject-verb relation, as in 29.

Different processing models make different predictions about the effect of distance on integration. Revision of the entire fragment does not seem to be economical according to standard processing models, such as Gibson’s (1998). In Gibson’s model, each incoming word activates the information associated with it in the mental lexicon. The level of activation may decrease as subsequent
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material is processed, and the information is harder to maintain when subsequent material introduces new discourse referents (Gibson and Warren, 1997). Therefore, when additional discourse referents are introduced between a (non-matrix) subject and its verb, it is harder to integrate the verb with the subject, because more effort is needed to reactivate the information associated with the subject. This model therefore predicts increasing processing difficulty with the verb as distance (in terms of the number of new discourse referents) between the subject and the verb becomes greater, even when the subject features have been correctly tracked.

This prediction is falsified by our results. In particular, a matching of features between a noun and the following pronoun can be a stronger interpretation source. Clitics need a clear antecedent and the first noun is the easiest candidate. At this point the system prefers to insert a new referent and revise the “marking stage” so that the first noun is reinterpreted as a topicalized object. A stronger principle of Grammatical Codification of these structures is at play to consider these as stable structures and to be established quickly grammatical relations.

6. Conclusions
The attraction effect is the result of an analysis of syntactic structure applied to abstract representations. We found attraction to be sensitive to categorial distinctions and to indicate subtle cross-linguistic distinctions in the pronominal systems of Romance languages. Fewer attraction effects were found with clitics than with prepositional modifiers, since there are no weak subject pronouns in Italian and clitics must be in a local configuration with the verb. According to minimality effects these elements are different enough to be distinguished from subjects.

We also found that a different mechanism operates in the construction of pronominal arguments. The possible interplay between marking and morphing levels should be better investigated to develop synergies between what it is called grammatical agreement (morphing level) and discourse level information (marking level). As for the present research with Italian object clitics the construction of grammatical relations should be investigated in additional languages in order to increase our understanding of the agreement operation.

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Exploring the L2 syntax/morphology interface in the DP domain: a study on the L2 acquisition of German nominal inflectional morphology by Italian adult learners

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This work is mainly concerned with the acquisition of some aspects of the morphosyntax of German possessive constructions by a group of 18 Italian adult L2 learners with different levels of proficiency (Beginners, Intermediate, Advanced learners). In the present study, I address the issue of morphological variability more in details with the attempt to define a fine-grained scenario of L2 strategies adopted by Italian learners when facing the process of morphological insertion. Specifically, the morphosyntactic domains investigated are possessive constructions of the –s Genitive type. Overall, findings indicate a substantial dissociation between syntax and morphology (i.e. Parodi et al 2004 for L2 acquisition of German nominals by Romance learners). As for syntax, L1 transfer seems to operate in a ‘selective’ way (i.e. discrepancy between early production of L2 AP-NP order vs gradual use of –s Genitive constructions). As for morphology, different strategies emerged depending on the item involved in the inflectional process (–s Genitives vs APs) as well as on the syntactic configuration in which it is licensed (strong vs weak inflectional contexts). More generally, it emerges an interesting L2 tendency to simplify the morphological architecture of the German AP inflectional paradigm through the substitution of ‘default’ simpler forms.

Keywords: Morphosyntax, DP, morphological variability, German, Italian

1. Introduction
Since the pioneering studies on morpheme acquisition orders of the 1970s (i.e. Dulay & Burt a.o.), the phenomenon of variable use of inflectional morphology has been widely attested in the literature on L2 acquisition. In the last decade, many works have investigated this topic in a generative perspective with the aim of identifying the source of such difficulties, basically within a parameter-resetting paradigm.

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58 According to this view, adult learners’ failure to reach a native-like proficiency is mostly due to the inability to reset parameter values from L1 to L2.
Lardiere’s (1998a, b) study on Patty’s L2 acquisition of the morphosyntax of English finite verbs reveals a strong dissociation between a target L2 syntax (i.e. target finite verb placement; target case assignment on subjects) and a non-target inflectional morphology (i.e. omission of inflection on finite verbs) which is found even in the endstate grammar. Prévost and White (1999, 2000) examine variability in the use of verbal inflection in L2 French and German. They observe that L2 learners have difficulties in the overt realization of morphology although this fact does not correlate with lack of syntactic reflexes of finitess (i.e. non-target placement of finite verbs in the clause, non-target case assignment on subjects). Based on this findings, the authors argue that the problem of variable use of inflectional morphology lies in “learner’s imperfect mapping” of specific morphological forms to abstract categories (Missing Surface Inflection Hypothesis).

Recently, Lardiere (2005) has stressed that accounting for morphological variability in terms of a parameter-resetting paradigm is too simplistic. She proposes that it is the way in which grammatical features are morphologically combined in L1 vs L2 that may affect their overt realization during the course of acquisition. According to this view, L2 learners have to acquire a kind of morphological competence - the knowledge of which forms ‘go with’ which features - which enable them to (re)assembly features into new/different formal configurations (Feature Assembly Hypothesis).

A slightly different approach has been formulated by Slabakova (2009), who, on the basis of Lardiere’s hypothesis, points out that an alternative way of looking at L2 acquisition of the morphological component is to focus on the universal constraints of feature (re)assembly in L2 grammars. Slabakova argues that ‘a cline of difficulty’ in grammatical feature acquisition should be predictable on the basis of the ‘gradient’ of mismatch of grammatical features’ (re)assembly between L1 and L2. This scenario entails three hypothetical ‘learning situations’ as briefly schematized in (1):

![Figure 1: Cline of difficulty in grammatical feature acquisition (adapt. by Slabakova 2009)](image)

Taking as case point the L2 acquisition of grammatical gender, Slabakova (2009) illustrates the three different learning situations: learning a language which encodes gender represents a difficult task for speakers of a language which does not, like, for example, English. On the contrary, learning a language where only some re-assembly of the gender feature is necessary may not be problematic, whereas simple gender mapping is supposed to represent the easiest learning situation. These predictions are well captured in Sabourin et al. (2006)’s work on the L2 acquisition of grammatical gender in Dutch (three-gender system marking) by speakers of English (no gender marking), German
Exploring the L2 syntax/morphology interface in the DP domain

(three-gender system marking), Romance languages (two-gender system marking). Overall, the L2 population shows a high grade of accuracy in assigning L2 gender. However, interesting diverging interlanguage tendencies emerged, as predicted by Figure 1: German speakers are the most accurate; English speakers the less accurate, whereas Romance languages’ speakers perform right in the middle. More interestingly, Slabakova underlines the fact that, even the easiest learning situation of grammatical feature acquisition where no feature re-assembly is supposed, may involve difficulties for L2 learners. This is exactly what emerges, for example, in Slabakova & Gados’ (2008) study on the L2 acquisition of person and number features of the German auxiliary sein by speakers of English. Despite the fact that the two languages in this particular case use the same features, hence, in principle, no re-assembly across categories is necessary, results confirm that beginners and intermediate learners are highly inaccurate in performing the task. As pointed out by Slabakova (2009), these findings suggest that the Feature (re)Assembly Hypothesis is unable to capture all the problematic aspects of acquiring the L2 inflectional morphology and that, arguably, other additional factors (i.e. processing) have to be taken into consideration.

The present study looks at L2 acquisition of the morphosyntax of German nominals by Italian adult L2 learners. Specifically, possessive constructions of the –s Genitive types and adjectival phrases were investigated with the aim of assessing L2 accuracy both in the syntactic component (target placement of possessors and adjectives with respect to nouns) and in the morphological component (insertion/omission of target inflectional morphology). As already reported in the literature on L2 acquisition of nominals, results indicate a substantial dissociation between syntax and morphology. Acquisition of bound morphology seems to pose major problems for L2 learners, in particular commission errors prevail over missing inflection, a finding which is not surprising given that knowledge of agreement categories should be available via L1 transfer in Italian L2 learners of German. Hence, a fine-grained analysis of the non-target patterns concerning L2 production of -s Genitives and AP agreement morphology will be conducted and some conclusions on the basis of the recent hypotheses on L2 acquisition of morphology sketched so far will be drown.

The paper is organized as follows: in section 2, based on a comparative approach between German and Italian nominal morphosyntax, some predictions for the L2 acquisition of the topics investigated for this study will be formulated; section 3 focus on the experimental paradigm adopted and on the populations participating in the research project; section 4 is devoted to qualitative and quantitative analysis of the results; section 5 concludes the paper with a general discussion of the main findings.

2. On the Morphosyntax of German and Italian (possessive) DPs: some comparative remarks

In this study I focus in particular on the interaction between two different kinds of parametric variation that differentiate the (morpho)syntax of Italian and

59 Parodi et al (1999), (2004) investigate the L2 acquisition of different aspects of German nominal morphosyntax (use of determiners, plural marking, adjective placement) by Korean, Turkish and Romance speakers. They find that, whereas L2 syntax is clearly vulnerable for L1 transfer, inflectional morphology causes major acquisition difficulties regardless of learners’ L1 inflectional system.
German possessive DPs, namely (i) the different position of NP with respect to adjectives and (ii) the different position of bare proper name possessors (henceforth BPN Poss) with respect to NPs and APs. The relevant patterns are exemplified in (1) and (2) respectively:

(1)a  La borsa rossa  
      the.Fem.Sg bag.Fem.Sg red.Fem.Sg  
      “The red bag”

(1)b *La rossa borsa  
      the.Fem.Sg red.Fem.Sg bag.Fem.Sg  
(1)c *Die Tasche rote  
      the.Nom.Fem.Sg bag.Fem.Sg red.Fem.Sg.Weak  
(1)d Die rote Tasche  
      the.Nom.Fem.Sg red.Fem.Sg bag.Fem.Sg  

(2)a  Ilses rote Tasche  
      Ilse.Gen red.Nom.Fem.Sg bag.Fem.Sg  
      “Ilse’s red bag”

(2)b *di Ilse borsa rossa  
      of Ilse bag.Fem.Sg red.Fem.Sg  
      “Ilse’s red bag”

(2)c la/una borsa rossa di Ilse  
      the.Fem.Sg/a.Fem.Sg bag.Fem.Sg red.Fem.Sg of Ilse  
      “Ilse’s red bag/one of Ilse’s bags”

(2)d la/una sua borsa  
      the.Fem.Sg/a.Fem.Sg her.Fem.Sg bag.Fem.Sg  
      “Her bag/one of her bags”

As for (i), assuming Cinque’s proposal (1995, 2005) that adjectives are organized in a universal hierarchy based on their semantic properties, the variation in noun placement with respect to APs has been interpreted as a result of NP movement inside the nominal functional projection\(^{\text{60}}\); NP obligatory targets an intermediate specified position in Italian but not in German. As for (ii), assuming the traditional analysis that possessors are inserted in the lexical layer since they bear a theta-role assigned by the head noun, the fact that in German BPN Poss precedes adjectives and does not occur with any determiner suggests that the possessor is licensed in a high position outside the NP layer. Moreover, prenominal possessors of the type in (2)a force a definite interpretation of the whole DP in German. Contrary to German, Italian BPN Poss does not occur in prenominal position (2a vs 2b); instead it is licensed postnominally through the preposition \(di\) (2c) resulting in an analytic possessive

\(^{60}\) Following Shlonsky (2003) and Cinque (2005a) and (2005b), I will adopt the proposal that the noun moves through the DP as a maximal projections (NP) rather than as a bare head (N).
Exploring the L2 syntax/morphology interface in the DP domain

construction. Only a pronominal possessor shows up in prenominal position and may co-occur with a definite or indefinite determiner (2d).

On the basis of the multi-layered, articulated DP structure proposed by Haegeman (2004), Giusti (2005), (2006), Cinque (2005a,b) a.o., I assume for the German –s Genitive construction in (2)a and the Italian analytic possessive construction in (2)c the following derivations:

(3)a 
[SpecDFinP Ilses, [DFin [SpecIP t, [F [SpecFP Tasche] [F [SpecNP t, [NP t, j]]]]]]]]

b [DFin la [IP ..[SpecFP borsa] [F [SpecFP rossa[F [SpecNP di Ilsse [NP t, j]]]]]]

The derivation in (3)a illustrates the fact that, in German, BPN Poss with –s affix undergoes a two-step movement in the German DP: from its merge position (SpecNP) it raises to SpecIP in order to check the genitive case feature. Further movement to SpecDFinP is triggered by the requirement to check a semantic feature (definiteness). Furthermore, NP targets a SpecFP position just below the lexical layer. Contrary to German, BPN Poss is licensed in situ in Italian possessive constructions through preposition insertion whereas NP raises to an intermediate SpecFP position. According to this proposals, insertion of inflectional morphology on Possessors and APs is interpreted as the ‘visible’ result of such agreement relations.

Concerning the morphological variation between German and Italian at the DP level, it should be stressed that both languages possess a rich inflectional paradigm for marking Gender, Number and, crucially for German, also Case. The most important difference involves the AP inflectional system. In German, Case, Gender, Number features as well as the Determiner choice interact in a very complex way and determine the so called weak/strong inflection on adjectives. In general terms, when D appears as a bare form (4a) or there is no determiner introducing the nominal (4b), APs carry the strong inflection. Otherwise APs show up with the weak inflection (4c):

(4)a Peter hat ein rotes Auto
Peter has a.Acc.Neut.Sg red.Acc.Sg.Strong car.Neut
‘Peter has a red car’

(4)b Peter rotes Auto
‘Peter’s red car’

61 As proposed by Cinque (2005), a reason as to why NP has to move may lie in the licensing conditions imposed on adjective phrases, and namely the need to be endowed with a nominal feature in order to be licensed.

62 The complete paradigm of German adjectival declension is given in the Appendix.

63 The AP inflection paradigm used with indefinite determiner or possessive pronouns is called Mixed Inflection: it is mostly equivalent to the weak inflection, except in three contexts (Singular Masculine/Neuter Nominative and Singular Neuter Accusative) when it is equivalent to the strong inflection.
It is worth noting that the opposition of Gender, Number and Case is marked through five different endings on APs (-e, -en, -er, -em, -es) in the strong paradigm of inflection, whereas in the weak paradigm of inflection such fine-grained distinction is neutralized and only the two endings (-e/-en) appear on nominal modifiers. Concerning –s Genitive constructions as in (4)b, they have a very restricted distribution. The -s affix does not inflect according to Gender and Number and attaches to singular bare proper names/kinship terms only.

Contrary to German, in Italian the declension is mostly reduced to the alternation –a/e (Feminine; Singular/Plural) vs –o/i (Masculine Singular/Plural) and nominal agreement surfaces on both determiners and APs:

(5)a La/le macchina/e rossa/e
the.Fem.Sg/Pl car.Fem.Sg/Pl red.Fem.Sg/Pl
‘the red car(s)’

(5)b Il/i nuovo/i libro/i
the.Masc.Sg/Pl new.Masc.Sg/Pl book. Masc.Sg/Pl
‘the new book(s)’

With these very brief comparative remarks in mind, let us now consider the implications for the acquisition of –s Genitive constructions in Italian L2 learners. At the level of syntax, this process implies the resetting of parameters responsible for the opposite linear order of non-pronominal possessors and APs in both languages. This might cause initial difficulties due to L1 transfer. Specifically, as far as AP placement is concerned, a L1 linear order NP-AP should be expected at least for Beginners L2 learners. Moreover, an initial preference for analytic possessives constructions over –s Genitives might emerge in L2 learners’ production of possessive DPs.

At the level of morphology, due to the fact that knowledge of L2 adjectival agreement categories is available via L1 Transfer, no missing inflection phenomena are expected. However, insertion of morphology on BPN Poss and APs by Italian learners of German represents an interesting case of L2 features (re)assembly in the sense of Lardiere (2005). Specifically, in Italian, Determiners, APs and NPs are morphologically marked for Gender and Number, whereas, contrary to German, a Case inflectional paradigm is preserved only in the clitic system in Italian. Hence, in addition to the fact that German has a three-gender system marking, a Case feature not morphologically realized in the L1 is involved in the L2 inflection of both BPN Poss and APs. Table (1) illustrates the main differences on the grammatical features involved in the DP morphology of German and Italian:

---

An exception is represented by a group of APs ending in -e which inflect for number only (la ragazza/il ragazzo intelligente; le ragazze/i ragazzi intelligenti – the smart girl(s)/boy(s)).
Moreover, as already pointed out, the complex AP system of inflection interacts crucially with the syntactic component, in that the choice of the article (null D, (un)inflected D) determines the nature of the AP inflectional paradigm (weak vs strong).

Considering such differences, a (re)-assembly of how grammatical features (Gender, Number and Case) are combined in the L2 is then required and, in terms of Slabakova (2009)’s idea on the L2 cline of difficulty, this task should determine for Italian speakers a quite difficult learning situation.

3. The experimental procedure

The data analysed here are part of a large corpus collected by means of two different tasks and analysed in Matteini (2007). For the purpose of this study, I concentrate only on the oral Picture Description Task (henceforth PDT).

In the PDT, experimental subjects were asked to look at a drawing while listening to some information about the content of the picture and then to answer a question posed by the investigator. Subjects were also advised to answer with sentences containing a verb. A total of 40 DPs with adjectives were elicited for each student; 25 out of 40 DPs were possessive constructions (10 with and adjective and 15 without). The corpus collected consists of 1170 tokens. The study presented here is based on the analysis of a total of 630 DPs containing attributive APs and –s Genitive possessors.

A group of 18 Italian learners of German and 8 native speakers participated in the experiment. All subjects were tested individually. Their production were recorded and then transcribed. The L2 population were attending classes at the University of Siena at the time of the experiment. Informants’ ages ranged from 19 to 43; their level of proficiency was established through standardized proficiency tests running at the beginning of their courses. There were 4 Beginners; 10 Intermediate and 4 Advanced learners of German.

4. The Data

4.1 –s Genitive Constructions

Figure (2) and Table (2) indicate that the acquisition of –s Genitive Constructions is characterized by a clear developmental path. Beginners show a non-native like performance; they only resort to possessive constructions similar to their L1 (mostly Analytic Possessive Constructions: Das ist das Buch von Peter – This is Peter’s book); in Intermediate L2 learners, the production of –s Genitive Constructions increases considerably with respect to Beginners, whereas in Advanced L2 learners –s Genitive constructions represent the

Two samples of items are given in the Appendix.
favourite option for expressing the possession. These facts are represented in Table 1 and Figure 2 below:

<table>
<thead>
<tr>
<th></th>
<th>Beginners</th>
<th>Intermediate learners</th>
<th>Advanced learners</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0/100</td>
<td>91/250</td>
<td>65/100</td>
<td>137/200</td>
</tr>
<tr>
<td></td>
<td>(0%)</td>
<td>(36%)</td>
<td>(65%)</td>
<td>(69%)</td>
</tr>
</tbody>
</table>

Table 1 – Production of –s Genitive DPs

Concerning morphology suppliance on BPN Poss, –s insertion increases depending on proficiency level (Intermediate L2 learners (66/100); Advanced L2 learners (65/65). Figure (3) illustrates this:

Figure 2 - PDT: -s Genitive DPs (%) according to Level of Proficiency

Figure 3: (%) Target morphology on BPN Poss
Missing inflection is the only non target pattern attested and it is restricted to Intermediate L2 learners only. It is worth noting that omission of –s affix is not optional/random in this group of learners. In analyzing the L2 patterns individually, it emerges that only 3 out of 8 subjects consistently avoids –s insertion, as clearly indicated by Figure 4:

Figure 4 - (%) -s Genitive Morphology in Intermediate L2ers: Individual Tendency

Focusing on the correlation between BPN Poss placement and omission/insertion of inflectional morphology, it should be stressed that possessors occurring in postnominal position are always found introduced by a Case assigner (the preposition von – of), as in (6a):

(6)a Das ist die blaue Bluse von Inge
This is the.Nom.Fem.Sg blue.Nom.Sg.Weak shirt.Fem of Inge
‘This is Inge’s blue shirt’

or realized as a full DPs inflected in the Genitive case:

(6)b Das ist das Buch *[des Peters]66
This is the.Nom.Neut.Sg book.Neut.Sg. the.Gen Peter.Gen
‘This is Peter’s book

66 In this case the genitive declension of singular common nouns has been applied to proper names resulting in a non-target structure.
4.2 DPs with adjectives
Concerning the tendency observed in the production of DPs with adjectives, it is worth observing that the L1 linear order NP-AP is not attested, whereas the L2 linear order AP-NP is produced at a high rate across L2 learners groups:

<table>
<thead>
<tr>
<th>L2 Groups</th>
<th>AP-NP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginners</td>
<td>105/122</td>
</tr>
<tr>
<td></td>
<td>(86%)</td>
</tr>
<tr>
<td>Intermediate learners</td>
<td>280/300</td>
</tr>
<tr>
<td></td>
<td>(93%)</td>
</tr>
<tr>
<td>Advanced learners</td>
<td>119/120</td>
</tr>
<tr>
<td></td>
<td>(99%)</td>
</tr>
<tr>
<td>Controls</td>
<td>225/240</td>
</tr>
<tr>
<td></td>
<td>(94%)</td>
</tr>
</tbody>
</table>

Table 2 – Production of AP-NP linear order

Moreover, accuracy on target AP morphology is fairly low regardless of proficiency level (Beginners: 38% (46/122); Intermediate: 32% (95/300); Advanced 41% (49/120)). These findings are reported in Figure (6):
Concerning insertion/omission of inflectional morphology, several kinds of non-target patterns emerge:

(i) **Agreement Matching**: DPs surface with a non-target morphology on determiners and adjectives, although a Gender/Number/Case agreement matching between both elements is established:

(7) a. Der *[eine spanische] Freund] 
    the man *[one Spanish] friend] 
    vs 
    einem spanisch [en] Freund] 
    a.Dat.Masc.Sg Spanish Dat.Masc.Sg friend.Masc

    “The man is speaking with one of his Spanish friends”

(ii) **AP Ending Substitution**: non-target morphology is restricted to APs only, whereas determiners show up correctly inflected for Gender/Number/Case:

(8) a. Das [der *gelben] Rock] der Kari 
    This [the no. yellow.[-] skirt.masc the.fem. Kari 
    vs 
    der gelbe Rock der Kari

    “This is the yellow skirt of one of the Kari’s friends”
(ii) **Missing Inflection:** Agreement inflection on APs is dropped. On the contrary, determiners have target Gender/Number/Case morphology:

```
(9) Da Kin nimmt [eine *gelbØ] Blume]
   Th chil take.Pres. a.Acc.Fem yellow.Ø flower.Fe
   e d 3Sg .Sg m.Sg
   vs
   eine gelbe Blume
b
   a.Acc.Fem yellow.Acc.Fem.Sg flower.Fe .Sg .Weak m.Sg
   "The child takes a yellow flower"
```

(iii) **Agreement Mismatching:** In this case, contrary to the non-target pattern labelled as Agreement Matching, a feature clash between Ds and APs emerges. As a consequence, phi-features on both elements do not match. An example is given in (10)a, where the nominative masculine singular noun *Mantel* (coat) is introduced by the definite determiner *die* which mark nominative/accusative feminine nouns in the weak singular paradigm of inflection\(^\text{67}\). On the contrary, the suffix *–er* on the attributive adjective *weiss* (white) marks the target Gender/Number/Case features of the noun but in the strong paradigm of inflection instead of the weak one required by the morphology on the determiner\(^\text{68}\):

```
(10)a Das ist *[die weisser Mantel] von Albert
  This is the.Nom. white.Nom.Masch. coat.Masch of Albert
  Fem.Sg Sg.Strong
  vs
  der weisse Mantel von Albert
b
  Masch.Sg Sg.Weak
```

---

\(^{67}\) With plural nouns, the determiner *die* is used in Nominative/Accusative contexts regardless of Gender distinction

\(^{68}\) Hence, in addition to a “features clash” between D and AP, a mismatch regarding the weak/strong paradigm of inflection on APs also emerges here. In fact, according to the morphology on the determiner, the adjective *weiss* requires a weak inflectional morphology *(–e)* and not the strong inflectional marker *(–er)* supplied in this context by the L2 learner.
It is worth considering that, across L2 learners’ groups, Agreement Matching and AP Ending Substitution prevail over Missing Inflection and Agreement Mismatching, which is restricted to Beginners and Intermediate learners. Furthermore, Missing Inflection is attested at a low rate in all the three groups. Figure (6) exemplifies these facts:

![Figure 6 - L2 Morphological variability: Patterns across L2 learners' groups](image)

Let us now turn more in details to the L2 strategies adopted in the non-target patterns. Concerning the Agreement Matching pattern, the data reveal an overuse of the agreement endings -e/-e on determiners and adjectives. These endings mark Nominative/Accusative feminine singular DPs in German. As a consequence, nominals show up with a non-target Case/Gender morphology independently from the one required by the context (see 7a vs b). This strategy emerges in all the three L2 learners’ groups (Beginners 18% - 21/120; Intermediate 21% - 63/120; Advanced 21% - 25/120). As far as the AP Ending Substitution pattern is concerned, I found an overuse on adjectives of the ending -e/-en (see 8a vs b) which have the largest distribution in the German AP (weak/strong) inflectional paradigm. This strategy mostly prevails in Intermediate and Advanced L2 learners (Beginners 13% - 16/120; Intermediate 30% - 36/120; Advanced 22% 30/120). Finally, Missing Inflection is mainly attested in weak inflectional contexts in Beginners (78% - 7/9) and Intermediate (73% - 33/45) L2 learners (see 9a), while Advanced L2 learners resort to this strategy only in –s Genitive constructions (60% - 9/15), which requires a strong inflectional morphology on APs (60% - 9/15). Example (11) illustrates this:

(11)a Das ist Karls schwarzØ Kravatte
This is Karl.Gen blackØ tye.Fem.Sg

vs

b Karls schwarze Kravatte
Karl.Gen black.Nom. tye.Fem.Sg
5. Discussion
Overall, findings indicate that L2 learners are very accurate as for BPN Poss/AP placement is concerned, whereas accuracy on inflectional morphology represents a problematic domain regardless of proficiency level. The data show a substantial dissociation between syntax and morphology, as already reported in previous L2 studies on this topic (i.e. Lardiere 1998a,b for clausal domain, Parodi et al. 1999, 2004 for nominal domain).

At the level of syntax, results on the production of –s Genitives constructions suggest that the interlanguage grammar is clearly influenced by L1 representation in the first stages of acquisition (Schwartz & Sprouse 1996). The L2 learners resort to the pattern they already know from their L1 (Analytic Constructions prevail over –s Genitives). Similar findings have been reported for L2 Dutch by Van de Craats et al. (2000). Concerning NP placement, no considerable differences emerge in learners’ performance, despite their different levels of proficiency in the L2. Resetting of the word-order parameter relevant for the different position of NP with respect to nominal modifiers in Italian and German seems to be an easier target to achieve (but see Parodi et al. 2004 for different findings in Italian untutored L2 learners of German). On the basis of the discrepancy that emerged between an early production of L2 AP-NP order and the gradual use of –s Genitive constructions, it seems reasonable to conclude that transfer phenomena operate in a ‘selective’ way. Hence, in this case, only BPN Poss Movement Parameter appears to be sensitive for L1 transfer.

At the level of morphology, the comparison between the acquisition of –s affix and the AP adjectival inflection reveals interesting asymmetries. As expected, Missing Inflection is a very limited phenomenon in both domains. However, while in –s Genitive constructions omission of –s affix prevails over commission errors and follows a developmental path, in AP contexts the opposite tendency emerges. In this case, L2 learners, regardless of their proficiency level, resort to the insertion of non-target morphology to a greater extend. Nevertheless, a fine-grained analysis of the L2 patterns show that the use of non-target AP agreement morphology obeys a principle of ‘morphological economy’. Specifically, a general tendency towards a ‘morphological reduction’ of the German AP inflectional paradigm emerges and seems to operate at different levels: (i) only on the AP node where inflection has to be inserted. In this case L2 learners reduce the AP inflectional system to the endings -e/-en which have the widest distribution in the German inflectional paradigm. Hence ‘AP Ending Substitution’ emerges; (ii) at the DP level (i.e. Agreement Matching pattern). L2 learners reduce the German Case/Gender system to the

Fem.Sg.Strong
“This is Karl’s black tye”
Exploring the L2 syntax/morphology interface in the DP domain

Nominative/Accusative Feminine -e/-e, which seems to ‘reproduce’, from a morpho-phonological point of view, the paradigm of Italian nominal agreement system ending in vowels. On the contrary, evidence for a “feature clash” (i.e. Agreement Mismatching pattern) are quite limited and restricted to non-advanced levels of proficiency (Beginners and Intermediate learners). According to Lardiere’s Feature Assembly Hypothesis, these results suggests that the acquisition of morphological competence which enable L2 learners to assembly new features into different formal configurations seems to be possible, at least, for -s suffix, where a perfect ‘one-to one’ correspondence between the acquisition of a new feature and a new (invariable) morphological marker is established. A slightly different kind of consideration is needed for the acquisition of AP inflectional morphology, which, on the contrary, represents a more complex case of feature re-assembly due to the interplay of three different features (Gender, Number, Case) with their various morphological manifestations. The acquisition of a morphological competence seems to cause major problems here, although it should be stressed that inflectional morphology is not randomly assigned by L2 learners in these contexts. Further investigations on other L2 populations acquiring German and whose L1s possess a morphological paradigm more similar to the German one, would be interesting in order to assess whether the ‘morphological reduction’ strategy adopted by Italian L2 learners is affected by a morpho-phonological transfer or it reflects a more general economy principle driven by the requirement of ‘morphological uniformity’.

Finally, the picture that emerges partially support Slabakova’s idea on the cline of difficulty in grammatical feature acquisition. In fact, results on the acquisition of AP agreement morphology where a re-assembly of Case, Gender and Number features is involved, represents a problematic learning situation for Italian speakers of German even at advanced levels. On the contrary, -s Genitive constructions should fall under the most difficult learning situation, in that a new feature (i.e. Case) which is not morphologically realized in the L1 has to be acquired. However, as observed in L2 learners’ paths of development, this task is gradually achieved. This last consideration seems then to strengthen the idea expressed by Lardiere’s (2005) that it is the way grammatical features are morphologically combined in the L2 vs L1 that affects their realization in the course of acquisition.

References


Appendix

1. German AP Inflectional Paradigm

**Table A - Strong Inflection on Adjectives (null determiners)**

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Singular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>weiss-er Mantel</td>
<td>gut-e Frau</td>
<td>gut -es Kind</td>
</tr>
<tr>
<td>Genitive</td>
<td>-en Mantels</td>
<td>-er</td>
<td>-en KINDES</td>
</tr>
<tr>
<td>Dative</td>
<td>-em</td>
<td>-er</td>
<td>-em</td>
</tr>
<tr>
<td>Accusative</td>
<td>-en</td>
<td>-e</td>
<td>-es</td>
</tr>
<tr>
<td><strong>Plural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>weiss-e Mäntel</td>
<td>gut-e Frauen</td>
<td>Gut-e Kinder</td>
</tr>
<tr>
<td>Genitive</td>
<td>-er</td>
<td>-er</td>
<td>-er</td>
</tr>
<tr>
<td>Dative</td>
<td>-en Mänteln</td>
<td>-en</td>
<td>-en KINDERN</td>
</tr>
<tr>
<td>Accusative</td>
<td>-e</td>
<td>-e</td>
<td>-e</td>
</tr>
</tbody>
</table>

**Table B - Weak Inflection on Adjectives (i.e with Definite determiners, Demonstratives)**

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Singular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>Der weiss-e Mantel</td>
<td>Die gut-e Frau</td>
<td>Das gut -e Kind</td>
</tr>
<tr>
<td>Genitive</td>
<td>Des weiss-en Mantel-s</td>
<td>Der gut-en Frau</td>
<td>Des gut-en KINDES</td>
</tr>
<tr>
<td>Dative</td>
<td>Dem weiss-en</td>
<td>Der gut-en</td>
<td>Dem gut-en</td>
</tr>
<tr>
<td>Accusative</td>
<td>Den weiss-en</td>
<td>Die gut-e</td>
<td>Das gut-e</td>
</tr>
<tr>
<td><strong>Plural</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>Die weiss-e Mäntel</td>
<td>Die gut-en Frauen</td>
<td>Die gut-en KINDER</td>
</tr>
<tr>
<td>Genitive</td>
<td>Der weiss-en</td>
<td>Die gut –en</td>
<td>Der gut –en</td>
</tr>
<tr>
<td>Dative</td>
<td>Den weiss-en Mäntel-n</td>
<td>Den gut –en</td>
<td>Den gut -en KINDER-n</td>
</tr>
<tr>
<td>Accusative</td>
<td>Die weiss-en</td>
<td>Die gut –en</td>
<td>die gut –en</td>
</tr>
</tbody>
</table>

**Table C - Mixed Inflection on Adjectives (i.e with Indefinite Ds, possessives)**

<table>
<thead>
<tr>
<th></th>
<th>Masculine</th>
<th>Feminine</th>
<th>Neuter</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Singular</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominative</td>
<td>ein weiss-er Mantel</td>
<td>eine gut-e Frau</td>
<td>ein gut -es Kind</td>
</tr>
<tr>
<td>Genitive</td>
<td>eines weiss-en Mantel-s</td>
<td>einer gut-en Frau</td>
<td>eines gut-en KINDES</td>
</tr>
<tr>
<td>Dative</td>
<td>einem weiss-en</td>
<td>einer gut-en</td>
<td>einem gut-en</td>
</tr>
<tr>
<td>Accusative</td>
<td>einem weiss-en</td>
<td>eine gut-e</td>
<td>ein gut-es</td>
</tr>
</tbody>
</table>

2. The Picture Description Task: item samples

- (i) Possessives constructions of the –s Genitive types in two structural conditions (15 simple DPs and 10 DPs with adjectives); all the question items were formulated through the wh-element *Wessen* (whose), as in (A);
- (ii) DPs with attributive adjectives (30 DPs); only APs of colour/nationality were included in the task, as in (B):
Investigator:
*Wessen Buch ist das?*
„Whose book is his?“

Expected answer:
*Das ist Peters Buch*
„This is Peter’s Book“

Investigator:
*Was trägt die Lehrerin?*
„What’s the teacher wearing?“

Expected answer:
*Eine blaue Bluse*
„A blue shirt“
On the elements of syntactic variation*

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In the first part of this paper, I would like to go back to the origins of the notion of parameters, briefly present the first steps of parametric theory some 30 years ago, and discuss an important conceptual change that took place very early on in the development of parametric syntax: the identification of the locus of parameters not in the structure of principles, but in the functional lexicon. I will then try to spell out a conception of the format of parameters as elementary instructions for syntactic actions; I will argue that this view is fully consistent with basic tenets of minimalist models, and in fact crucially capitalizes on the restrictive character of minimalist syntax. In the second part, I would like to turn to language acquisition and syntactic variation: how early is abstract grammatical knowledge of cross-linguistically variable properties acquired by the child? I will focus on the acquisition of a fundamental word order property, the VO or OV order, and discuss experiment evidence bearing on this issue. The available experimental evidence supports the view that the child possesses abstract knowledge of word order properties from very early on; this is more naturally compatible with the assumption that a dedicated language faculty, in the form of a parametrized system, constrains linguistic variation.

0. Introduction.

This talk is divided into two independent parts. The first part is conceptual and historical. The hope is that a historical perspective may somehow help us evaluate where we stand now in the theoretical study of syntactic variation, and possibly suggest where we want to go. I would like to go back to the origins of the notion of parameters, briefly present the first steps of parametric theory some 30 years ago, and discuss an important conceptual change that took place very early on in the development of parametric syntax. I will then try to spell out a view on parametrisation which, in my opinion, is implicitly assumed in much current work in comparative syntax. It seems to me that this view is fully consistent with basic tenets of minimalist models, and in fact crucially capitalizes on the restrictive character of minimalist syntax.

In the second part, I would like to turn to language acquisition and syntactic variation. The context is a broader issue now on focus in the debate in the cognitive neurosciences: is linguistic variation constrained by the human language faculty? Or, is it just a particular case of cultural variation that is solely constrained by general intelligence and multipurpose problem solving skills? One central empirical contribution that acquisition studies can give here

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is to provide evidence on the time course of the acquisition process: how early is abstract grammatical knowledge of cross-linguistically variable properties acquired by the child? I will focus on the acquisition of a fundamental word order property, the VO or OV order, and discuss an experiment bearing on this issue. I will suggest that the available experimental evidence is more naturally compatible with the assumption that a dedicated language faculty, in the form of a parametrized system, constrains linguistic variation.

Part I: Parameters as the elements of syntactic variation.

1. Origins.

So, let’s start from the beginning and in the beginning (at least for the linguists of my generation, formed in the early 1970’s) there was the Extended Standard Theory with the structure expressed in (1).

\[ \text{(1) EST Models (i.e., Chomsky 1973, 1975, 1977):} \]

\[
- \text{Particular grammar: system of language-specific, construction-specific rules} \\
- \text{Universal grammar: grammatical metatheory specifying a broad format for rules and some general principles on rule application (A over A, Island constraints, etc.)} \\
- \text{Acquisition: rule induction}
\]

The theory was really centered on the notion of particular grammars as systems of rules specific to a particular language and construction-specific: there were phrase structure rules for the NP and the VP, and construction-related transformational rules like passive, question formation etc. which constituted the grammar of English, and similar rule systems were postulated for Italian, Chinese, etc.. Universal Grammar was thought of as a kind of a general metatheory of grammatical properties specifying the format for rules and expressing certain general constraints on rule application such as the A over A principle and a few others. This system presupposed a particular conception of language acquisition. Acquisition would be rule induction: the child would act like a “small linguist”, unconsciously formulating and testing hypotheses in order to figure out what the rules of his particular grammar were on the basis of the format provided by Universal Grammar and of the empirical evidence presented to him.

There were some obvious problems with this way of looking at things. One critical problem was that a system based on language specific rules wasn’t suitable for comparing languages: one would build a rule system for language A, and then start from scratch and build another rule system for language B, etc. Such rule systems would obviously bear some kind of family resemblance, but one couldn’t really put the finger on the primitive properties that remained uniform or that varied, a rather frustrating state of affairs. Comparative syntax wasn’t really feasible on that basis because the fundamental invariant and variable elements could not be isolated in a sufficiently transparent manner.
Another serious problem was that this system couldn’t really address the problem of acquisition because there weren’t precise enough ideas about how rule induction could work. So that technically the analyses at that time did not attain the level of adequacy that Chomsky (1964) had called “explanatory adequacy”, the level which is reached when an analysis somehow comes with an account of how the relevant properties could be acquired by the language learner. It was clear at that time that one could hope to successfully address this problem only by radically restricting the options offered by Universal Grammar, i.e. by making the rule systems among which the child was assumed to choose more and more impoverished.

Things changed around the second half of the 1970s. Recently, I came across the passage in (3) in Chomsky’s *Conditions on rules of grammar*, as far as I can tell, this is the first mention of the term parameter:

(2) “Even if conditions are language- or rule-particular, there are limits to the possible diversity of grammar. Thus, such conditions can be regarded as parameters that have to be fixed (for the language, or for particular rules, in the worst case), in language learning. … It has often been supposed that conditions on application of rules must be quite general, even universal, to be significant, but that need not be the case if establishing a “parametric” condition permits us to reduce substantially the class of possible rules”


Chomsky somehow considered the abstract possibility that certain principles or rules could be parameterized and that could account for certain aspects of variation. The idea was purely abstract at that time but the first concrete instantiation came up a few years later with the case of extraction from indirect questions, the selective violation of wh-islands. It turned out that in some languages it is possible to extract an element from an indirect question as in (5) in Italian, while in other languages this option doesn’t exist.

(3) Ecco un incarico [CP che [IP non so proprio [CP a chi [IP potremmo affidare ___]]]]

‘Here is a task that I really don’t know to whom we could entrust’

In my original analysis (Rizzi 1978) I compared Italian and English but in English things turned out to be quite complex (see, e.g., Grimshaw 1986), so for the purposes of this illustration I have used a German example here in (4), a language which manifests a robust impossibility of extracting something from an indirect question. If you take the word by word equivalent of (3) in German, modulo word order, etc. you get an ungrammatical sentence:

(4) *Das ist eine Aufgabe, [CP die [IP ich wirklich nicht weiss [CP wer ___ anvertrauen koennten]]]

‘Here is a task that I really don’t know to whom we could entrust’
It seemed too radical to assume that the relevant locality principle deemed to be responsible for (4), Subjacency, would not be operative at all in languages like Italian: somewhat more complex examples showed that Italian is sensitive to locality effects reasonably amenable to Subjacency. For instance, while extraction from an indirect question is normally possible, extraction from an indirect question which in turn is embedded under another indirect question (a double wh island) was clearly degraded:

(5) *Ecco un incarico [CP che [IP non so proprio [CP a chi [IP si domandino [CP se [IP potremmo affidare ___]]]]]]

‘Here is a task that I really don’t know to whom they wonder if we could entrust’

So, the idea was proposed that Subjacency is operative in both language types, banning movement across two bounding nodes; but the set of bounding nodes could be parameterized in a way that would yield the difference between the two languages: i.e., by taking CP as the clausal bounding node for Italian, and IP for German (in fact, S’ and S in the original notation). So that two BN (two occurrences of IP) would be crossed in (4), but only one BN (CP) would be crossed in (3); two CP’s would be crossed in the double wh island (5), thus accounting for the deviance of the structure in Italian.

This turned out to be a rather peripheral parameter in retrospect (in fact, one that is not easily amenable to the general format to be discussed later on), but the important point is that it was soon realized that one could entertain the ambitious program of dealing with the whole cross-linguistic variation in terms of parametric choices; the postulation of a set of language specific rules could be disposed with entirely.

Parametric theory introduced a powerful technical language for doing comparative syntax, one which permitted a transparent identification of invariant and variable properties. So it is not surprising that comparative syntax flourished as soon as the new “principles and parameters” approach was introduced (Chomsky 1981). I believe it wouldn’t be difficult for a historian of our field to gather massive evidence in scholarly journals, proceedings of conferences, and book series documenting a rather dramatic shift: in very few years, comparative generative grammar grew from very sparse attempts to a substantial body of scholarly work on dozens or hundreds of languages analyzed in a comparative perspective in terms of the parametric model. Moreover, the theory of principles and parameters provided a promising model of the

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69 Certain varieties of German are very restrictive on wh extraction, banning extraction even from embedded declaratives and permitting the expression of question like “Who do you think we should meet?” through other techniques, such as “partial movement” (Felser 2004). The strong restrictions on extraction in such varieties have sometimes been treated in terms of the parametrisation of bounding nodes, e.g. in Freidin (1988). Other varieties, spoken e.g. in Southern Germany and Austria, permit extraction from declaratives and still manifest a robust wh island banning examples like (4).
acquisition of syntax *qua* parameter setting, a much more appealing conception than one based on an obscure notion of rule induction. Reaching the level of explanatory adequacy thus became a feasible enterprise, even if by no means an obvious one.

2. From “parameters expressed in principles” to “parameters in the functional lexicon”

A theory of parameters should address the questions of the *format* (what is a possible parameter?) and of the *locus* (where are parameters expressed?) of such entities. Initially, not much theoretical reflection was devoted to the format of parameters, but clearly there were ideas on the locus. The assumption was made that, as the first parameter looked like an option specified on a principle, perhaps that was the locus of parameters in general, so that UG principles would somehow express parameters.

(6) Parameters expressed in principles: : each UG principle specifies one (or a small number of) parameter(s), a choice point to be fixed on a certain value for the principle to become operative.

This had certain consequences. For instance, it gave a rough idea about the possible size of the set of parameters: as there were few principles, one would expect few parameters. It may be that we have a dozen principles so we may have a dozen or maybe two dozen parameters, something like that. It also gave rise to the so-called switchboard model. I think, the image is originally due to James Higginbotham and essentially is that the child is confronted with a little switchboard with principles specifying parameters, and then the acquisition process consists essentially in setting the switches on the basis of experience; once this is done, the syntax of the language is acquired.

As I said, not much attention was paid initially to the format of parameters, that is to say, to what a possible parameter is. So that virtually every property was proposed as a potential target of parameterization. In (7), I give a little list of parameters that were identified around the late 1970’s or in the early or mid-1980s.

(7)
- the bounding nodes are… (Rizzi 1978, Sportiche 1981,...)
- null subjects are licit, (Taraldsen 1978, Rizzi 1982,...)
- *believe* type verbs select an IP (English vs. Romance: Chomsky 1981)
- P assigns structural/inherent Case (P-stranding,…,Kayne 1983)
- the head precedes/follows the complement,
- V moves to I (Emonds 1978, Pollock 1989),
- V moves to C (V–2 Germanic: Den Besten 1977/1982)
- N incorporates into V (Baker 1988)
- Nominative is assigned under agreement (SVO) or under government (VSO) (Koopman & Sportiche 1991)
- there are long-distance anaphors (English vs Icelandic, etc.: Manzini & Wexler 1986)
- wh-movement is overt or covert… (English vs Chinese, etc.: Huang 1982)
- the language is non-configurational (K. Hale)

So, we have bounding nodes, we have the licensing of empty elements, we have certain selectional properties of special verb classes like believe-type epistemic verbs, movement properties of various sorts and also very general statements about global properties of a language like Ken Hale’s proposal that there is a configurationality parameter. Some languages are configurational, based on hierarchically organized structures, others are non-configurational, involving flat (or flatter) structures, and that affects in a very deep way the whole structure of the language; first and foremost this property is responsible for the freedom in word order.

It became clear pretty soon, already in the early 80s, that there was something wrong with this view. There were a number of problems. One was the unnatural character of the list in (7). And then, there were the other problems indicated in (8).

(8) Some problems with the model of “parameters as specifications on principles”, in addition to the arbitrary-looking character of the list of the first parameters:

a. Some principles didn’t appear to be parametrized at all.

b. Some parameters appeared to be directly keyed to the presence of particular lexical items.

c. Other global parameters like non-configurationality turned out to be advantageously reanalysable as conglomerates of more elementary parameters:

One problem was that some principles didn’t seem to require or allow a parametrisation. Take for instance hierarchical properties of X-bar theory - always the same across languages, presumably: structures are built by heads projecting and taking complements and specifiers - ; the Theta Criterion (e.g., no known language seems to admit structure like “*My friends seem that John likes Mary”, “*Bill happens that John left early”, leaving a DP in argument position not integrated into a thematic nucleus); certain aspects of the Binding theory (Principle C doesn’t seem to be parameterized at all: whenever a pronoun c-commands a DP, a referential dependency is uniformly banned, as in “He thinks that John will win” and its equivalent across languages, modulo linear order and other language-specific peculiarities).

The second problem, perhaps more important, was that some parameters appeared to be directly related to the presence of a particular lexical item in the language. Take for instance long-distance anaphora. It is very clear that we cannot say that long-distance anaphora is a global parameter concerning the
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binding theory in one language because it depends on the presence in the lexicon of that language of a particular item that functions as a long-distance anaphor, like *sig* in Icelandic for instance, which has such type of binding properties. So, clearly, long distance anaphora is not a global property of the language but it’s a property of a particular lexical item.

Moreover, it turned out that certain global parameters like non-configurationality could be advantageously reanalyzed as conglomerates of smaller parameters. It is clear that null subject languages are more non-configurational than non-null subject languages because they manifest a higher level of freedom in the position of the overt subject (with subject inversion, subject dislocation and the like). Scrambling languages also are more non-configurational than non-scrambling languages as they admit a number of alternative orderings (but if the analysis is refined, one particular order generally emerges as the fundamental one). Languages where it is possible to split the DP have more ordering options than languages which do not permit DP split (Boskovic 2009), etc.. So, one really gets a gradation of non-configurationality, not a continuum in the technical sense of course, but a number of discrete degrees that are better accounted for in terms of much smaller parameters. The extreme cases of this spectrum (say, English and Warlpiri) look like radically different systems, but many intermediate cases are attested, which again suggests the necessity of breaking up a very radical macroparameter into a set of parameters independent from one another and more restricted in scope.

A significant shift, directly suggested by problem (8)b, occurred at this point: the view that parameters are expressed on principles was abandoned in favour of the hypothesis that the locus of parameters is the functional lexicon.

(9) Parameters are not specified directly in UG principles, but rather are to be conceived of as featural specifications in the (functional) lexicon.

This shift is clearly expressed in the following quote taken from Hagit Borer.

(10) “The inventory of inflectional rules and of grammatical formatives in any given language is idiosyncratic and learned on the basis of input data. If all interlanguage variation is attributable to that system, the burden of learning is placed exactly on that component of grammar for which there is strong evidence of learning: the vocabulary and its idiosyncratic properties”

Borer (1983: 29)

I will basically adhere to this conception in the rest of this talk, but a preliminary caveat is in order. The idea of restricting the expression of parameters to the functional lexicon is clearly motivated by the desire of constraining the parametric space as much as possible. But it is not so obvious that all the properties that we want to consider parametric are exclusively associated to functional elements, at least if we assume a simple-minded, traditional view of the functional-contentive divide. Take for instance the familiar, sharp difference in syntactic behaviour between the infinitival
complements of epistemic verbs like *believe* in English and Romance as in (11):

(11) English:
   a. I believe [John to know the answer]
   b. *I believe [PRO to know the answer]
   c. John was believed [ ___ to know the answer]

   (12) Italian (Romance)
   c. *Credo [ (di) [Gianni sapere la risposta]]
   d. Credo [ di [ PRO sapere la risposta]]
   e. * Gianni era creduto [ (di) [ ___ sapere la risposta]]

In English, *believe* type verbs take infinitival complements which manifest exceptional Case marking, no control, and the possibility of licensing subject to subject raising, as in (11). In Romance, one gets the mirror image of these properties: no exceptional Case marking, control, and impossibility of raising, as in (12). Now, these properties seem somehow to be keyed to the selectional properties of *believe* vs. the equivalent in Romance languages: in classical GB terms, we have a lexical parameter differentiating the categorial selectional properties of epistemic verbs in Romance (which uniformly select a CP, with non-finite C overtly realized as Italian *di*, or null, as in French) and English (which apparently directly selects an infinitival IP, with the whole CP layer truncated); these seem to be parametric properties associated to (classes of) lexical verbs, at least if the divide between lexical and functional verbs is maintained in a traditional form
dev70.

Other problematic cases come to mind, e.g. the cross-linguistically (and language internally) variable c-selection of DP vs PP complements (*écouter la radio* vs *listen to the radio*; *entrer dans la chambre* vs *enter the room*), etc., and all the item-particular cases in which categorial selection seems to depart from the Canonical Structural Realisation of semantic selection (Grimshaw 1979, Pesetsky 1983) in language-specific, and item-specific ways. A possible solution here may be provided if “selected” prepositions are reanalyzed as being part of the functional structure associated to the verb, as in Kayne (2000).

In the reminder I will continue to make the assumption that the locus for the expression of parameters is the functional lexicon, but it is important to bear in mind the problems just mentioned, which may require a rethinking of the traditional divide between functional and substantive lexicon (see also Kayne, 2005, Cinque & Rizzi 2010 for discussion).

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70 The fact that these systematic properties affect whole classes of verbs, rather than single items, suggests a possible analysis consistent with the assumption that the parametrisation is limited to the functional lexicon, as Frédérique Berthelot suggests. Thinking of the decomposition of verbs into v and V components, the class could be characterized by the presence of a specially “flavoured” v, say \( v_{\text{epist}} \), which could be responsible for the c-selectional properties of the complex \( v_{\text{epist}} + \text{root} \). Things are further complicated by the fact that the class does not behave in a fully homogeneous manner (Postal 1974: *allege* differs somewhat from *believe*, etc.), which may require further refinements of the decomposition \( v + \text{root} \).
3. The theory of parameters in current models.

What does a parameter look like in current syntactic theorizing? Building on some suggestions in Rizzi (2009), I would like to propose the following informal characterisation:

(13) A parameter is an instruction for a certain syntactic action expressed as a feature on an item of the functional lexicon, and made operative when the item enters syntax as a head.

So, when an item is selected from the (functional) lexicon and enters syntax by acting as a head to be merged with other syntactic entities, it will contain certain formal featural specifications which will instruct syntax by triggering certain syntactic actions, first and foremost merge itself.

More precisely, I would like to propose the following extremely simple format for parameters:

(14) $H \text{ has } F \{\text{yes, no}\}$

Where $H$ is an item of the functional lexicon entering syntax as a head, and $F$ is a relevant feature. In order to make the system properly restrictive, we must now specify the range of $F$ more precisely. Features are the expression of properties of various kinds: of sounds, of meanings, etc. Most of such properties do not affect syntax in any way, so that they are not relevant here. I will make the rather standard assumption that in the set of possible linguistic features there is a well-defined and small subset of morphosyntactic features which have the property of triggering the basic syntactic actions. If we assume a highly restrictive theory of possible syntactic actions such as minimalism, parametric features will be restricted to the features triggering the basic operations of merge, move and spell-out. So, in a nutshell, we have the following basic typology of parameters:

(15) A typology of parameters:

1. Merge parameters:
   - $H$ c-selects XP (where XP departs from the canonical structural realisation of the s-selected entity).

2. Move parameters:
   - $H$ attracts X[$+F$]
   - $H$ attracts XP[$+F$]

3. Spell-out parameters:
   - $H$ is null
   - $H$ licenses a null Spec.

Merge parameters may primarily express cases in which the head’s categorial selection does not immediately reflect principles of canonical structural
realisation: e.g., the cases of “truncated” clausal selection of English epistemic verbs referred to in the previous section. Other cases may be the cross-linguistically variable orders in functional hierarchies: a Negative Phrase which can be very high (in the CP zone), or in the high, intermediate or low IP zone (Zanuttini 1997, Cinque 1999, Moscati 2007); types of Agreement (or agreement-bearing) heads, which can vary significantly from language to language (Cinque 1999, Belletti 2001); single or recursive Topic in the left periphery, presence or absence of Focus projections in the CP and/or in the vP periphery specialized to new information or contrast (Rizzi 1997, 2004, Belletti 2004, 2009, Cruschina 2006), etc..

Move parameters express the ability that a head has of attracting another head (incorporation), or a phrase to its specifier position (the latter case being uncontroversial and subsuming the former in some approaches). Parametric properties involving the movement of the verb to an inflectional head (Pollock 1989, Cinque 1999, Holmberg & Platzack 1995, Roberts & Holmberg 2005), and of the inflected verb to the C-system are expressed here, as well as all the parametric variation involved in movement to a Spec position (wh-movement languages vs. wh-*in-situ* languages, etc.); I omit here the further refinements required by the assumption that movement is search + (internal) merge (which could lead to distinct possible parametrisations on the search operation, and on internal merge). The head-complement ordering parameter may be seen as a Merge parameter in more traditional approaches, or as a Move parameters in antisymmetric approaches (Kayne 1994); or else as a spell-out parameter if ordering is a property confined to externalisation (Chomsky & Berwick 2009). Whatever the exact nature of this property, the crucial feature should be specified on the functional categories assigning the categorical status to lexical roots (i.e., v, n, a, p, etc.), with the greenbergian tendency to uniformity (Greenberg 1963) expressed grammatically (Biberauer, Holmberg, Roberts 2008) or explained extra-grammatically (Newmeyer 2005).

A straightforward spell-out parameter has to do with whether or not a given functional head is pronounced: so, a Top head is pronounced in Gungbe (Aboh 2004), but not in English; and with the licensing of a null specifier: Top has this property in Topic Drop languages (perhaps derivatively from the capacity that a given node may have to constitute the “root” of the structure: Rizzi 2006a); and some inflectional head has the capacity to license a null pronominal subject and/or a null pronominal object in some languages (Rizzi 1982, 1986), etc.

In a sense, this view leads us back to a version of the switchboard model, except that the switches are now expressed in the lexical items: each item of the functional lexicon has a small number of switches, corresponding to the typology in (15); acquiring the lexical item amounts to setting its switches on the basis of the linguistic data the learner is confronted with. So, a given head may c-select a particular category (departing from the canonical structural realisation of its s-selectional properties), attract another head or a specifier, be spelled out or not, and govern the spell-out properties of its Spec.
4. **On the numerosity of parameters.**

The view that the functional lexicon is the locus of parameters affects the expectations on the number of parameters:

(16) The size of the set of parameters is not determined by the number of principles, but by the size of the (functional) lexicon.

We will have many more parameters than it was initially assumed if the size of the set of parameters is related to the size of the functional lexicon. Clearly, there are many more opportunities for parametric specifications than in the assumption that the locus is the set of principles. Moreover, if cartographic studies are on the right track (Cinque ed. 2002, Belletti ed. 2004, Rizzi ed. 2004, Cinque & Rizzi 2010), the functional lexicon is much richer than in more traditional approaches, so the number of potential parametric specifications is even greater.

Such assumptions on the numerosity of parameters, a natural, and in fact virtually inescapable consequence of the conceptual shift reported in section 3, and of the view on the format in (14), are sometimes taken as a kind of *reductio ad absurdum* of the core idea of parametric syntax, the idea that syntactic diversity is amenable to a finite set of binary options open to all languages. If the options offered by the system are so numerous, why continue to call them parameters? Doesn’t the term improperly suggests a highly restrictive space of variation?

So, the current conception is sometimes seen as an undeclared retreat to the EST conception of grammar as a system of language-specific rules (see, e.g., Newmeyer 2004, 2005): if there are so many possible parameters, how is this conception different from one treating variation through language specific rules?

It seems to me that this argument overlooks the important distinction between the locus and the format of parameters. Under the current conception, the loci of parameters are quite numerous and diverse, a direct function of the size of the (functional) lexicon, as we have seen; but the format is extremely restrictive, as determined by the restrictiveness of minimalist syntax. The syntactic actions that a featural specification can triggered are very few, restricted to the very basic and general operations of merge, move and spell-out: the parametric space is thus radically more restricted than the space of possible language-specific rules of arbitrary complexity in EST models.

So, assimilating the two kinds of models overlooks what seems to me to be genuine and substantial progress in the identification of the basic ingredients of linguistic computations over more than thirty years of syntactic research.

Of course, the choice of a particular terminology is largely an arbitrary decision, inasmuch as it does not affect the nature of the devices referred to. So, one may decide not to use the term “parameters” for the devices referred to by (13), (14), (15) and call them “language-particular rules”, “item-specific rules”, or the like without changing in any way the structure of the approach. Nevertheless,
different terminological choices may not be completely innocent and neutral, as they may have very different connotations, somehow linked to the intellectual history of the field. In our particular case, using the term “rule” in connection to such specification as (13), (14), (15) seems to me to be highly misleading. First, because the term “rule” evokes the very complex phrase structure and transformational rules of pre-parametric models (the precise counterparts of the millenary tradition of language description through construction-based rules), which have nothing to do with the highly restrictive conception expressed in (13)-(14)-(15): an instruction to trigger one of very few syntactic actions made available by a very austere theory of syntax. Second, because the shift of the locus for parameters from UG principles to the functional lexicon took place already around the mid-1980’s, is a development largely (if not unanimously) accepted by the scientific community of comparative syntacticians, and major work in comparative syntax over the last quarter of a century has consistently used the parametric terminology to refer to such concepts and tools both in the pre-minimalist and minimalist era (see, e.g., Kayne 2000, and many contributions in Cinque & Kayne 2005). In the absence of a clear conceptual or formal shift, I think it would be very misleading to introduce a new terminology, or go back to a highly connotated old terminology.

The assumption we are now making on the numerosity of parameters has other consequences. If parameters are so numerous, it’s unlikely that a single parameter will fully control complex sets of properties, simply because there will be too many interactions. Many parameters imply many intricate interactions. It is a little bit like the fact that it is unlikely that a single gene will control very complex aspects of the structure of the body, say the whole shape and internal structure of an organ, simply because there are too many genes and there would be too many interactions.

If complex arrays of properties cannot be made to follow in any simple manner from single parametric values, this does not mean that parametric values only have “local” consequences, and a parameter-based system will have no deductive depth: quite the contrary is true. Parametric choices will typically have consequences well beyond the simple property they express because the system has a very tight deductive structure, and a small difference in one point will typically have systemic repercussions.

Pursuing our analogy with DNA, that is essentially like the repercussions that a single gene would have. A small mutation on a single regulatory gene could have radical and diversified consequences for the structure of the body, affecting different organs and cognitive capacities, precisely because of the tight interconnections in the system. The action of a single gene is local – it may be limited to turning on or off another gene, but this may have cascading effects with pervasive consequences. The same seems to be basically true with parameters. Their action is very local, for instance the licensing of a null argument by a functional head. But then some of these actions may happen to be performed in structural positions close to certain crucial ganglia or crossroads of the system, hence give rise to systemic repercussions. For instance the licensing
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of a null subject pronoun tightly interacts with various special properties of subjects: the obligatoriness of the subject position in the clausal structure (or the “EPP” in traditional GB terms), the constraints on subject extraction (two properties that may well be closely related: Rizzi 2006b, Rizzi & Shlonsky 2007), properties of the Case-agreement system, etc. So we observe that null subject languages typically have null expletives (for the formal satisfaction of the EPP property), and typically don’t manifest that-trace effects, as the availability of the null expletive offers a device to escape that-trace71. Should we then expect a perfect correlation between null subjects and the violability of that-trace? In this particular case, the connection may hold with remarkable systematicity (Nicolis 2005), but we can’t expect such correlations to hold perfectly in general, simply because some other microparametric property of the language may affect the general pattern (for instance, the language might disallow extraction from a tensed clause altogether, hence make the presence of a potential “skipping” device irrelevant). Analogously, we cannot expect non-Null Subject Languages to systematically manifest that-trace effects because other parametric options (such as a morphologically null version of the French que→qui rule) might create an independent skipping device, as presumably happens in the varieties of English not sensitive to that-trace, Sobin 2002, in Norwegian, Taraldsen 1986, etc.. Along similar lines, Romance null subject languages permit focalisation of the subject in a low, clause final position (Belletti 2004), a property which capitalizes on the availability of null subjects, but also requires an independent parametric option, the activation of the low focal position. So, certain Bantu null subject languages (Lingala, etc.) do not have this option, hence they do not manifest the “subject inversion” characteristic of Romance null subject languages.

In conclusion, there are very intricate cross-linguistic patterns of interactions which parametric theory can capture and elucidate, but, under current assumptions on the numerosity of parameters, there is no reason to expect that a single parameter could determine a complex cluster of properties. More precisely, that would be possible “all other things being equal”, i.e. in the abstract case of two systems differing for only one parameter, thus avoiding a priori the potential interfering effects of other parametric differences. Of course, such an extreme case never arises in practice; reasonable approximations may be found through the microcomparison of historically very close grammatical systems, i.e. in the cases provided by dialectological studies (the closest approximation to a controlled experiment in comparative syntax, as Richard Kayne pointed out: see Kayne 2000 for discussion).

71 In the terms of Rizzi and Shlonsky, op. cit., the null expletive offers a free skipping device from the freezing effects of the Subject Criterion: the expletive formally satisfies the criterion, and the thematic subject can be extracted from a lower position, thus skipping the freezing position).
Part II: On the acquisition of variable properties.

5. On the early acquisition of certain abstract grammatical properties.
In this second part I would like to address the question of how the child acquires cross-linguistically variable properties. I would like to try to phrase this question in the context of a broader issue: is linguistic variability constrained by a dedicated “language faculty”? or is it just a particular case of cultural, historically determined variation, with no domain-specific constraints? The former position has been a central assumption throughout the history of generative grammar; the theory of parameters is a particularly precise and empirically successful version of this position. The latter position is assumed by a large spectrum of viewpoints, recently taken up by Evans and Levinson (2009): there are certain contents to express, and there are indefinitely many imaginable ways to do so, hence an indefinite cross-linguistic variability is to be expected; linguistic communities make particular choices and language learners figure out what these choices are, as in any other case of cultural acquisition, through their general intelligence and domain-general problem-solving capacities.

The study of acquisition may provide relevant evidence on this broad divide. The timing of the acquisition process matters. So, we should really pay attention to how fast or how slow acquisition is. The first approach, let’s call it the “language faculty” approach in a synthetic form, naturally leads to the expectation of a fast acquisition of the cross-linguistically variable properties. The problem that the language learner is confronted with is very well defined and narrowly circumscribed and the learner is guided by task-specific cognitive resources which allow her to quickly converge to the correct parametric values. The second approach, which I will refer to as the “constructivist” approach, all other things being equal, leads to the expectation of a slower acquisition process, basically in line with other aspects of the development of general problem-solving capacities and the acquisition of cultural skills. For instance, one would expect a certain correspondence between the acquisition of variable properties of language and the acquisition of culturally-driven technical abilities of various sorts: reading, writing, drawing, and so on.

Let us address the question of the time course of acquisition in connection with the acquisition of a fundamental cross linguistically variable property: word order, and in particular the VO or OV order of the language. How early is this property acquired by the language learner? Corpus studies are unambiguous on this point: already in the first syntactically relevant productions, in the two word stage, the child conforms to the target order: so the two year older learning English will typically say “eat cake”, and the two year older learning Japanese will say “cake eat” (modulo morphophonological and lexical choices).

This is acknowledged by everyone, but the interpretations given by the two camps are very different. The language faculty approach typically assumes that the child has from very early on the abstract grammatical knowledge “my language is VO”, “my language is OV”, as a consequence of the early fixation
of an ordering parameter (a Merge parameter in traditional approaches; a Move parameter in antisymmetric approaches; an externalisation parameter in the analysis of Chomsky & Berwick 2009: the choice is not critical for the point relevant here).

On the other hand, the ‘constructivist’ hypothesis, proposed in this particular context by Michael Tomasello and his associates in a number of papers (Tomasello 2000, 2003, Achtar and Tomasello 1997, etc.), assumes that the child initially memorizes fragments she hears, and stores in memory individual items with the associated syntactic environments. So, there is no generalization initially, there is only memorization of fragments, individual items with the syntactic structures in which they are found. Initially the child retrieves such item-based knowledge and reproduces it in her early productions; only much later on does the child generalize such item-based knowledge to abstract and general grammatical statements like “my language is OV (or VO)”.

The two approaches lead to clearly different expectations on the child’s early capacity to generalize her knowledge to new items and structures: the parametric approach leads one to expect that there should be an immediate generalization to new structures because the relevant knowledge is abstract from early on; on the contrary, the ‘item-based’ approach expects that the young child should not be able to generalize because her initial knowledge is concrete, item-based (she hears and memorizes “eat apples”, and obediently reproduces “eat apples”), hence initially she has no basis to generalize to new items. To be fair, neither approach makes a very precise prediction on the time course of the acquisition of such abstract properties; nevertheless, within the parametric approach the straightforward interpretation of the target-consistent ordering in the two word stage (hence before the second birthday) is that the relevant parameter has already been correctly fixed at this point, while constructivist approaches seem to assume that abstract knowledge will arise through analogical generalisation only well after the third birthday (consider, e.g., the fact that children in the younger group tested by Matthews et al., on which see below, are around age 2.9). So, even though the two approaches do not generate very sharp predictions about the exact time course of the acquisition of abstract knowledge, they clearly lead to quite distinct expectation about the earlier or later character of such acquisition.

6. An experiment.

Let me now present an experiment which bears directly on this issue: Franck, Millotte, Posada &. Rizzi (2011). In order to test the abstract grammatical knowledge of 19 months old infants exposed to French, these authors combined three ingredients:

1. The preferential looking paradigm: the infant sits on her caretaker’s lap in front of two computer screens, and hears a sentence. The two screens reproduce short videos with two distinct actions, one matching and the other not matching the uttered sentence. The child looks preferentially (for a longer time) at the screen with the matching video (see Naigles 1990, Gertner, Fisher and Eisengart
2. The “weird word order” paradigm: the uttered sentence is sometimes an NP V NP sequence (grammatical in French), and sometimes an ungrammatical NP NP V sequence (this method is borrowed from production experiments reported in Abbot-Smith, Lieven & Tomasello 2001; Akhtar & Tomasello 1997; Matthews, Lieven, Theakston & Tomasello 2005; 2007, and adapted to comprehension).

3. Jabberwocky verbs are used, morphophonologically possible items which are not listed in the French lexicon.

Concretely, there are two conditions: grammatical (NP V NP) and ungrammatical (NP NP V) sentence.

In the grammatical condition the infant hears a sentence like “Le lion dase le chien” (the lion dases the dog), daser a possible but non-existent French verb. One of the videos reproduces a transitive action (for instance, the lion puts a crown on the dog’s head), and the other video a reflexive action (each one of the characters puts a crown on his own head).

In the ungrammatical condition the infant hears an ungrammatical sentence like “L’âne le chat poune” (the ass the cat pounes, a sentence violating the SVO order of French), with pouner a possible but non-existent French verb. Attention is paid to assign a natural-sounding prosody to the ungrammatical sentence, so that no obvious prosodic cue will mark it as deviant. As before, one of the videos reproduces a transitive action (for instance, the ass puts a crown on the cat’s head), and the other video a reflexive action (each one of the characters puts a crown on his own head).

The two approaches make clearly distinct predictions here. The parametric approach predicts a preference for the transitive video in the grammatical NP V NP condition, and no preference in the ungrammatical condition: in this approach it is natural to expect that at 19 months, or 1.7 years, around or right before the onset of the two-word stage, the infant will already have the abstract knowledge “my language is SVO”. So, as soon as she hears a sentence like “Le lion dase le chien”, even if she has never heard that particular verb, she will immediately recognize a transitive “agent – action – patient” sentence scheme and will look preferentially at the transitive video. On the other hand, the ungrammatical sentence “L’âne le chat poune” will not evoke any abstract grammatical scheme in French, so the sentence will not offer any guidance to the child to preferentially look at one or at the other video.

The item based approach, on the other hand, does not predict any preference in either case. As in this approach the infant does not have any abstract grammatical scheme to build on, but only item-based knowledge, she would have no good reason to prefer the transitive action only with the grammatical NP V NP order: both in the grammatical and ungrammatical order
she has not previously heard the occurring verb, hence in neither case does she have previous item-based knowledge to build on. So, no preference for a particular video is predicted in either case.

The experimental evidence clearly is in line with the expectations of the “abstract grammar” approach: it is reported in Franck et al (op.cit.) that infants look at the transitive video significantly more time than at the reflexive video in the grammatical NP V NP condition, while they show no preference between the two videos in the ungrammatical NP NP V condition (hence one cannot say that they prefer to look at transitive actions in general, regardless of the sentence they hear). So, the child acquiring French at 19 months appears to have abstract knowledge of the type “my language is SVO”. On the possible prosodic cues or statistical analysis which may guide the child to fix this fundamental word order property very early on, see Christophe, Nespor, Guasti, & Van Ooyen (2003), Gervain, Nespor, Mazuka, Horie, Mehler (2008).

There is an apparent contradiction between these results and the conclusion reached by Matthews et al. (2005, 2007) on the basis of production experiments. They elicited sentences with jabberwocky verbs which had been presented both in grammatical and weird word order; their claim is that older children (at 4 years) correct more weird word order sentences than younger children (at 2 years 9 months), who reproduce sentences in the weird word order more frequently than the older group. These authors thus claim that their production study supports the constructivist position: younger children at age 2.9 only have an item-based knowledge, which does not allow them to correct ungrammatical orders on the basis of an abstract grammatical schema. This result clearly conflicts with our result in comprehension, which shows abstract grammatical knowledge already at age of 1.7. Should one postulate a major divide between production and comprehension systems with respect to the availability of abstract grammatical properties?

Franck, Millotte & Lassotta (2010) have redone the Matthews et al. experiments by introducing certain modifications in the methodology, in particular by improving the communicative situation; they found that younger children at 2.11 were not distinguishable from older children at 3.11 in the weird word order task, showing as much abstract grammatical knowledge as the older group: both groups were found to match the grammatical word order significantly more often than ungrammatical word orders, also with jabberwocky verbs they had not heard before. Moreover, both younger and older children’s productions gave clear indications of morphosyntactic productivity in the grammatical NP V NP order, producing sentences like La vache, elle a dasé le chien ‘the cow, it has dased the dog’ with pronominalisation, dislocation, the introduction of compound tenses etc.. In contrast, children in both groups failed to produce any compound tense, special inflectional properties on the verb, pronouns, dislocations or other manipulations in their ungrammatical NP NP V sentences, which were systematically produced with full NPs and verbs in the present tense exactly as they appeared in the input. Both groups of children therefore used their productive grammatical knowledge when they produced sentences in the grammatical order, while they
just repeated the input string in the (rare) occasions in which they reproduced the ungrammatical NP NP V order. These authors therefore conclude that also the younger group shows grammatical knowledge of abstract word order properties: there is no basis for assuming an asymmetry between the two groups, nor between production and comprehension (except that, of course, production could not be tested in a reliable manner with children as young as 1.7, as they are just about to enter the two-word stage). Franck et al. (2010) then conclude that when production is tested in plausible communicative conditions, children of the younger group show no less abstract knowledge than children of the older group, as the language faculty approach would lead us to expect.

7. Conclusions.

Parameters of syntactic variation can be thought of as morphosyntactic features expressed on the items of the functional lexicon and acting as instructions for the basic syntactic actions: merge, move, spell out. Parameters are numerous because their locus of expression, the functional lexicon, is rich; nevertheless, the space of variation is severely constrained because the possible syntactic actions in a minimalist model are so limited. Combining the central idea of the principles and parameters approach with minimalist syntax thus yields a coherent, restrictive system for the study of language variation. The numerosity of parameters makes it unlikely that a single parameter may be able to fully control a complex cluster of properties, because there will inevitably be too many interactions with other parametric values (with the possible exception of Kayne’s “controlled experiments” in comparative syntax, the privileged cases arising from the microcomparative analysis of very close varieties, and approximating the ideal of two systems differing for a single parametric value). The complexity of the interactions does not mean that the system has a limited deductive structure and that each parameter only has local consequences. Quite the contrary is true: each parameter will enter into complex deductive interactions with principles and other parametric values, and disentangling and reassembling the elementary components of such interactions will continue to shed light on the observed, complex patterns of variation.

In the brief second part, I have broadened the perspective to the general issue of the nature of cross-linguistic variation, and the plausibility of assuming dedicated cognitive resources constraining linguistic variability. Crucial evidence on this issue can come from the study of the timing and characteristics of language acquisition. I have focus on one particular case study: the rapidity of the acquisition of language-particular word order properties in the form of abstract and general grammatical knowledge seems hard to reconcile with a view looking at language as a cultural object, with the acquisition of variable properties solely guided by general intelligence and general problem-solving skills, much as the acquisition of a simple technology of some kind; the evidence I discussed is more readily consistent with a view such as the parametric approach, in which the child is guided very early on to have certain expectations about structural properties of the language, and to quickly make well-defined choices of a rather abstract character.
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References.


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