On the acquisition of object A’ dependencies.

More on the comprehension of Relative clauses (and wh-questions). ClLD and intervention-locality

HO3
The role of number (vs gender) in Italian

Number has a similar ameliorating effect in Italian in a Number mismatch condition as gender mismatch in Hebrew (Adani, van der Lely, Forgiarini, Guasti 2010):

**M:** *Il leone che il gatto sta toccando e` seduto per terra*
- The lion-SG that the cat-SG is touching is sitting on the ground

**MM:** *Il leone che i coccodrilli stanno toccando e` seduto per terra*
- The lion-SG that the crocs-PL are touching is sitting on the ground

Percentages of correct comprehension

<table>
<thead>
<tr>
<th>Feature</th>
<th>Match</th>
<th>G5yo</th>
<th>G7yo</th>
<th>G9yo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>M</td>
<td>41</td>
<td>79</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>MM</td>
<td>64</td>
<td>88</td>
<td>95</td>
</tr>
</tbody>
</table>

In the spirit of BFBR (2012): Number enters into agreement relation in Italian, much as Gender does in Hebrew; hence it is a feature to which the locality/RM principle is sensitive as it is an attracting feature.

Crucial role played by the **crosslinguistic comparative perspective. No intrinsic role/value** of a given morphological feature *per se.*
The role of number (vs gender) in French

From Durrleman & Bentea 2017.
No difference when agreement is audible on the verb.
Rather, better comprehension when it is not audible (i.e. Head Plural- Subject Singular)

Effect of number mismatch (p<.05)
No effect of type of agreement (p>.05)
An aside on the *growing trees* approach

- Note that the difficulty with the object A’ dependencies under study is not related to the lack of the position in the left periphery, as one might hypothesize.

- The difficulty is crucially related to the subject vs object asymmetry made explicit through the intervention approach under discussion.

- Interestingly, other aspects of development in the use of the left periphery can instead be characterized precisely through the hypothesis that the relevant positions are not available at the relevant stage of development.

- This situations is shown by the results on corpus study + repetition task run on Hebrew and is accounted for by the so called *growing trees* approach (Friedmann, Belletti and Rizzi 2019 in progress).

- I invite projects on similar corpus study in Italian, through use of the Childes database for youngest ages (until 3). + Repetition tasks also in older ages....
The growing of syntactic trees

From Friedmann, Belletti and Rizzi 2019 in progress (cfr. SynCart workshop, Gala)
Further feature possibly relevant for fRM: Case

- Since we are dealing with a movement created dependency, it is reasonable to hypothesize that only features that are implied in triggering syntactic movement be the relevant ones, as in the proposal discussed.

- Recent results on the irrelevance of Case distinctions in enhancing the comprehension of ORs confirm the hypothesis: Case is not a feature relevant in A’-dependencies. Indeed, there are no Case driven A’-processes (Friedmann, Rizzi, Belletti 2016, Glossa), nor is Case a feature triggering movement.

- Specifically: no Case inflection on V. T does not establish Agree in Case with the target DP. Case is a feature on DP (the goal) not on T (the probe). Case is a nominal feature not a verbal inflectional feature. The hypothesis is that relevant features are features active on the probe.

- In Hebrew (DOM/Differential Object Marking) marking of direct objects does not enhance the comprehension of object A’-dependencies. E.g. the following which questions were both relatively poorly understood by young Hebrew speaking children, thus indicating that the Case distinction did not help them (with 3 to 4;5 worse than 4;6-6;5)
et- and non-et Object which-questions in Hebrew (Friedmann, Rizzi & Belletti 2017)

In Hebrew *et*-marked and non-*et*-marked *which*-object questions are not fully understood by 3;0-6;5 y.o. children, with no difference between the two.

*et* eize pil ha-arie martiv?
acc which elephant the-lion wets?
eize pil ha-arie martiv?
which elephant the-lion wets?

Comparable results have also been obtained in the comprehension of OVS sentences with topicalized direct objects with and without *et*, compared to simple SVO. See later.
pe- and non-pe Object Relatives in Romanian (Bentea 2016)

Direct object relatives with overt case-marking (DORpe)

Arată-mi elefantul pe care crocodilul îl stropește.
show-me elephant.the.M.SG PE which crocodile.the.M.SG him splashes
‘Show me the elephant that the crocodile splashes.’

Direct object relatives without overt case-marking (DOR)

Arată-mi elefantul care crocodilul îl stropește.
show-me elephant.the.M.SG which crocodile.the.M.SG him splashes
‘Show me the elephant that the crocodile splashes.’
Both types are equally poorly comprehended (30% and 29% respectively) by 4 to 6;10 y.o. Romanian-speaking children (data from Bentea 2016: 74-75, exx. 12, 13; Figure 3.3)
DOM in acquisition

This is especially revealing as DOM properties are early acquired in most of/all the languages in which the acquisition of DOM has been studied (including e.g. Romanian, Avram 2015).

Same in Hebrew: Reznick & Friedmann (in press) on the error-free repetition of (360) Hebrew sentences containing a definite direct object marked with et in very young children in a repetition task.
Case in Greek ORs

An equivalent conclusion has been reached by Angelopoulos and Terzi (Gala 2017) on the (lack of) role of Case in Greek to build the correct dependency in ORs. (Children, aged aged 4;1 to 5;2)

In the authors’ words:

**Consequence 4:** Case does not intervene in the computation of locality in Greek immature grammar.

<table>
<thead>
<tr>
<th>SUBJ RCS-VERSION 1</th>
<th>OBJ RCS-VERSION 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/360</td>
<td>74/360</td>
</tr>
<tr>
<td>4.72%</td>
<td>20.55%</td>
</tr>
</tbody>
</table>

Version 1 = Relative head nominative (same Case as extraction site in SRs, different in Ors >> *here is Dp\textsubscript{nom}*).

Version 2 = Relative head accusative (same Case as extraction site in Ors >> *show me the Dp\textsubscript{acc}*: no significant difference when the head is nominative as in version 1. This is the comparable mismatch situation as the one in the Romanian examples discussed earlier).

Cfr. Also Varlokosta et al. (2015)
Morphosyntactic features: The special status of attracting features

In conclusion, the crucial property is not that much whether there is an intervenor - as the features of the lexical subject may be modulated – nor the distance between X and Y – as from the following consideration:

There are reasons to assume (following Rizzi (1982), Rizzi & Shlonsky (2007)) that, in Italian type languages, the extraction site of the subject is low in the clause structure and does not correspond to the high (Cardinaletti 2004) subject position (a criterial position from which movement cannot occur)

Then, assuming this analysis, the distance between the two extraction sites is not that different in SRs and ORs:

\[ [+R.... [_{TP} pro T ..... [_{VP} <S> v [_{VP} V <O>]]]] \]

With also movement through a vP-peripheral edge position in both cases, not indicated for clarity.
Morphosyntactic features: The special status of attracting features

Rather, the crucial property is whether the Target (X) and the Intervener (Z) share some relevant features, where relevant =

**feature attracting syntactic movement**

**Overtness** does not seem to play any special role:

- Despite its overt expression, Case morphology/Case markers do not ameliorate comprehension of object A’-dependencies across an intervening lexical subject in typically developing children (cfr. Romanian, Hebrew, Greek; also in SLI, HI, and agrammatism, cfr. Hebrew, German, Russian). See also the irrelevance of audible vs non-audible number agreement in French (with number playing the relevant role anyway, independently of its audibility).

- Overtness in gender distinction does not ameliorate the comprehension of object relatives either (Italian and French vs Hebrew; nor of wh which-questions), nor of other object A’-dependencies such as e.g. CILD in Italian (/Romance...), Hebrew Topicalization (see below).
“What makes things easier”

Something *overt*? A so called *cue* as in cue-based accounts?

The real question is: What counts as a *cue*?

If overtness were the real relevant concept, why not all overt distinctions should play a role? E.g.:

- Why does *gender* only play a role in Hebrew but not in Italian?
  - >> one distinction more in Hebrew than in Italian. But then:

- Why doesn’t the overt *Case* distinction help in Hebrew? It adds a distinction, internally to Hebrew (DO distinct from S, P-DP vs DP) and also compared to e.g. Italian (DO is not distinct from S, both are DPs).

Features triggering syntactic movement seem to play a crucial role in making a distinction relevant in the establishment of the long distance movement created dependency.

This is in fact a possible characterization of what may count as a *cue*, at least in this type of movement created dependency.
CLLD and intervention in comprehension and production

ANOTHER OBJECT A’-DEPENDENCY IN COMPREHENSION
On the comprehension and production of some discourse related constructions

From early on young children master the discourse conditions leading to appropriate production and comprehension of discourse related constructions, such as CLLDs, passive, discourse appropriate use of null-subjects and of new-information post-verbal subjects.

They do so in compliance with featural Relativized Minimality/fRM operating in a stricter fashion than in the adult system, in the spirit of Friedmann et al. (2009) approach and subsequent related work reviewed.

Let us concentrate on CLLD.
fRM and children comprehension and production of CLLD structures

CLLD:

1. **Comprehension**: Summary of results from comprehension of CLLD in number mismatch condition compared to gender mismatch.

2. **Production**: Types of topics in children’s productions of CLLD with special focus on a-Topics.
Comprehension of CLLD in Number mismatch condition (from Manetti, Moscati, Rizzi, and Belletti 2016)

- Number Mismatch

**DP₁ DP₂ CL-V**

**SO:**
- I gatti
  - The cats\textsubscript{sub}
- il cane
  - the dog\textsubscript{obj}
- lo lavano
  - him\textsubscript{CL} washes

**OS:**
- Il cane
  - The dog\textsubscript{obj}
- i gatti
  - the cats\textsubscript{sub}
- lo lavano
  - him\textsubscript{CL} wash

Task: PVT
Comprehension of CLLD in Gender mismatch condition (from Manetti et al. 2016)

<table>
<thead>
<tr>
<th>Gender Mismatch</th>
<th>DP₁ DP₂ CL-V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SO:</strong></td>
<td>La bambina il principe lo fotografa</td>
</tr>
<tr>
<td></td>
<td>The girl sub,fem the prince obj,mas him CL,mas photographs</td>
</tr>
<tr>
<td><strong>OS:</strong></td>
<td>Il principe la bambina lo fotografa</td>
</tr>
<tr>
<td></td>
<td>The prince obj,mas the girl sub,fem him CL photographs</td>
</tr>
</tbody>
</table>

- Ambiguity in number and gender match condition:
  - Il gatto il cane lo morde
  - The cat the dog him CL bite
Overall comprehension in mismatch conditions
(from Manetti et al. 2016)

**Adults:** ceiling performance in both conditions, 100%.

**Children:** correct comprehension of CLLDs up to 70%.

<table>
<thead>
<tr>
<th></th>
<th>Correct</th>
<th>Non correct</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ADULTS</strong></td>
<td>100%</td>
<td>0%</td>
</tr>
<tr>
<td><strong>CHILDREN</strong></td>
<td>70%</td>
<td>30%</td>
</tr>
</tbody>
</table>

![Bar chart showing comprehension percentage for adults and children.](chart.png)
Children’s comprehension in different mismatch conditions: Gender vs Number
(from Manetti et al. 2016)

- Children’s comprehension differs across mismatch conditions
- Better comprehension of CLLD in Number mismatch than in Gender mismatch

![Bar chart showing accuracy comparison between Gender and Number mismatch conditions](image)

Gender vs Number

- Gender: 52%
- Number: 88%

(Accuracy: Number 88% vs 52%; p<.001)
Children’s comprehension in different mismatch conditions: Gender vs Number (from Manetti et al. 2016)

SO comprehension appears slightly better than OS, but no significant effect emerged.

<table>
<thead>
<tr>
<th>Accuracy in children’s responses</th>
<th>GENDER</th>
<th>NUMBER</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SO</td>
<td>OS</td>
<td>SO</td>
</tr>
<tr>
<td>Target</td>
<td>63</td>
<td>55</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td><strong>56%</strong></td>
<td><strong>49%</strong></td>
<td><strong>90%</strong></td>
</tr>
<tr>
<td>Non-target</td>
<td>49</td>
<td>57</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td><strong>44%</strong></td>
<td><strong>51%</strong></td>
<td><strong>10%</strong></td>
</tr>
<tr>
<td>Total</td>
<td>112</td>
<td>112</td>
<td>112</td>
</tr>
</tbody>
</table>
The match condition (ambiguous)

- In the number and gender match condition (ambiguous):
  
  *Il gatto, il cane lo morde*
  
  the cat, the dog it-Cl bites

- Children (appear to) allow for both interpretation SOClV or OSClV, with a slight preference for SOClV

- Adults (correctly) allowed for both interpretations on a par.

Graph 1

However, children’s behavior is not adult like (both interpretations would indeed be correct >> preference), but rather, it is at chance, as indicated by the mismatch condition (>> only one correct answer).

Children cannot interpret the structure, as the gender vs number results show.
fRM and **Number vs Gender** in CLLD

- **Number mismatch** → **intersection**
  of relevant feature is created between target and intervener, accessible to the child

- **Gender mismatch** → **inclusion**
  remains problematic for the child

(1) Il gatto  i cani  lo mordono  
the cats  the dogs  it\textsubscript{CL} bite  
... +Top,+NP, +sing ...+NP, +pl

(2) Il principe  la bambina  lo fotografa  
the prince  the girl  him\textsubscript{CL} photographs  
...+Top +NP ... +NP

*(Illustrating with O S ClV, for simplicity)*
Summary of main results in comprehension of CLLD

- Adults correctly comprehended all unambiguous CLLDs
- Children’s comprehension of CLLDs reached 70% accuracy:
  - Word order SO vs OS did not play any significant role
  - Featural mismatch did play a significant role >>

children performed above chance in number mismatch (almost at ceiling), and at chance in gender mismatch condition.
Zooming on the two possible orders of DPs

DP₀ DPₛ CL V

DP₀ DPₛ [(<S>) - CL – V <O>]

DPₛ DP₀ CL V

DPₛ DP₀ [<S> - CL – V <O>]

Crossing is partial for both DPₛ and DP₀ chains (not the whole chains in both S crossing over O in the Left Periphery, and O crossing over S in TP).

The whole DPₛ chain intervenes anyway (with S in Spec/TP or in Spec/TopP)

This may provide a possible advantage for this order (Krapova & Cinque 2008).

Recall, however, the results reviewed: no significant preference in the order of DPs in the gender match condition (Manetti et al. 2016).

This point will be reconsidered in later slides.
**Number vs Gender**: Same results in CLLD as in Ors (and wh-questions)

- If the features relevant for fRM are those triggering syntactic movement, as displacement is involved in the relevant relations, then, in terms of fRM:

  **Number** is a relevant feature for the computation of fRM, because it participates in the triggering of syntactic movement (recall: S-V agreement), whereas **Gender** is not (recall: in Italian, in contrast with Hebrew).

- Consistently, in CLLD under number/gender feature mismatch the same results are found as in, e.g., in the comprehension of Object relative clauses.
Case. Hebrew topicalization: *et* does not help. Comparable results as in wh-questions.

**Object topicalization with V-to-C (et-O V S).**

et ha pil ha-ze martiv ha-arie
acc the-elephant the-this wets the-lion

*This elephant, the lion wets*

**Simple SVO (S V et-O)**

ha-arie martiv et ha-pil ha-ze
the-lion wets acc the-elephant the-this

*The lion wets this elephant*
Case. Hebrew topicalization: *et* does not help.

- Similarly to the developing children investigated on wh which-questions, all impaired populations (children with hearing impairment, agrammatic aphasics, Syntactic SLI) were sensitive to the presence of the object marker, otherwise they would have interpreted the OVS structures as SVO with systematic below-chance performance.
- The **Case** information was detected, but could not be used to build the A’-dependency and hence to properly comprehend the structures.