Abstract: In this paper I investigate the anaphoric interpretation of null and overt pronominal subjects in temporal adjuncts in child Romanian. The results show that 5-year old Romanian children make no distinction between null and overt pronominal subjects (personal pronouns and demonstratives) with respect to antecedent choice. I tentatively interpret the results as indicating that 5-year olds cannot fully integrate knowledge of the syntax of subjects with discourse information.

Keywords: null pronominal subject, overt pronominal subject, anaphora resolution, demonstrative, L1 Romanian

1. Introduction

Null subject languages allow both overt and null pronominal subjects (pro) in finite clauses, as the examples in (1) from Portuguese show:

(1) a. **Ela** está no jardim.
    b. **pro** está no jardim.
    ‘She is in the garden.’

The interpretation of such null and pronominal subjects is constrained by discourse pragmatic factors; it is a phenomenon at the interface between syntax and pragmatics. One common assumption with respect to the null vs. overt pronominal subject alternation in intra-sentential contexts in null subject languages is that null subjects preferentially take a prominent antecedent, whereas overt pronominal subjects take a less prominent one (Carminati 2002). These preferences have been shown, however, to be subject to cross-linguistic variation (Alonso-Ovalle et al. 2002, Filiaci 2011, Filiaci et al. 2013). This is also reflected in the acquisition path. Several studies report a delay in the acquisition of adult-like antecedent preferences. In some languages, antecedent preferences for null pronominal subjects are acquired earlier (see, e.g. Serratrice 2007, Sorace et al. 2009 for Italian, Kraš and Stipeč 2013 for Croatian). For other languages it has been reported that 5-year-olds have no clear preference for the antecedent of either null or overt pronominal subjects (e.g. for European Portuguese, Lobo and Silva 2015). The age at which adult-like preferences are attested may also differ from one language to another (e.g. Italian vs. Croatian, Kraš and Stipeč 2013). Extending the investigation to other languages could shed light on the acquisition of the conditions governing the antecedent preferences of pronominal subjects. This is precisely the goal of the present paper.

Previous studies on early subjects in Romanian focused on the investigation of subject production in spontaneous speech (Avram and Coene 2010, Teodorescu 2014).
The general picture which emerges from these studies is that Romanian children use subjects in an adult-like manner before the age of three. As far as I know, there is no previously published study on the interpretation of pronominal subjects in intra-sentential contexts in Romanian\footnote{But see Avram and Teodorescu (2015) for more recent results.}. The present study tries to fill in this gap. I investigate the interpretation of null and pronominal subjects in temporal adjuncts in child Romanian.

The paper is organized as follows: Section 2 presents Carminati’s (2002) Position of Antecedent Hypothesis and the predictions which it makes with respect to antecedent preferences of null and overt pronominal subjects in Romanian. Some previous acquisition studies on antecedent preferences of null and overt subjects in null subject languages are briefly presented in Section 3. In Section 4 I present my own study on antecedent preferences of null and overt subjects in child Romanian. The main findings are summarized in Section 5.

2. Carminati’s PAH. Predictions for Romanian

According to Carminati’s (2002) Position of Antecedent Hypothesis (PAH) in intra-sentential anaphora contexts, null pronouns prefer the most prominent antecedent (which corresponds to the one occurring in the Specifier of IP). Overt pronouns prefer a less prominent antecedent (the one which occupies a position lower in the structure, e.g. the object position). For example, in (2a), the null subject will preferentially take Maria, which is in the Specifier of IP, as its antecedent; in (2b), the overt pronominal subject lei will preferentially take Vanessa, the DP in subject position, as its antecedent:

(2)  
\begin{enumerate}
  \item Maria scrisse spesso a Vanessa quando pro\(\text{io}\) era negli Stati Uniti.
  \item Maria scrisse spesso a Vanessa quando lei\(\text{io}\) era negli Stati Uniti.
\end{enumerate}

‘Maria often wrote to Vanessa when she was in the USA.’

(from Carminati 2002)

There are two important remarks one has to make in relation to this hypothesis. The first one is that it identifies a tendency, a preference, and not a syntactic pattern. This pattern builds on the interaction between pragmatic properties of the anaphor (Ariel’s 1990 Accessibility Hierarchy) and the syntactic position of the antecedent.

The second one is that Carminati identifies this generalization on the basis of Italian data and she explicitly mentions that it may be subject to language variation, in spite of the fact that she refers to Ariel’s Accessibility Hierarchy, assumed to be universal. Indeed, several studies which investigated the Position of Antecedent Hypothesis revealed that the preferences are not the same across languages. In Greek, for example, null pronominal subjects preferentially choose a prominent antecedent and overt pronominal subjects a lower antecedent, as predicted by the hypothesis (Papadopoulou et al. 2015, Tsimpli et al. 2003, 2004). The preference pattern in European Portuguese supports the hypothesis as well. But data from Spanish (Filiaci 2008) and Hebrew
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(Meridor 2006) show that in these languages overt pronouns do not preferentially choose a less prominent antecedent; the choice is random in this case. The crosslinguistic picture indicates that the null pronominal subject bias is the same across languages, but the overt pronominal subject bias is resolved differently.

Romanian is a null subject language in which the verb moves to Inflection (Dobrovie-Sorin 1994). Both null and overt pronominal subjects are allowed in finite clauses, as illustrated in (3):

(3) a. El a stropit motanul.
    he has splashed cat-DEF
    ‘He has splashed the cat.’

 b. pro a stropit motanul.
    pro has splashed cat-DEF
    ‘He has splashed the cat.’

The pre-verbal subject occurs, according to some studies, in Spec IP, which is analysed as a non-argumental position. Within this analysis, the subject receives Nominative case in Spec VP, and then moves to Spec IP, an A-bar position, which can host topicalized constituents (Dobrovie-Sorin 1994, Alboiu 2002). According to other studies, pre-verbal subjects move to the left periphery of the clause, in the C-domain (Avram 1992, Cornilcescu 2000). Irrespective of the details of these two main directions of analysis, they both place the pre-verbal subject in a position structurally higher than the object, i.e. the pre-verbal subject is structurally prominent.

According to Carminati’s (2002) PAH, in a context like the one in (4), the null subject in the embedded clause will preferentially choose the DP in subject position in the matrix as its antecedent, whereas the overt pronominal subject in (5) will preferentially choose the lower DP in the matrix, i.e. the DP in object position. In (4), then, pro will be preferentially co-indexed with elefantul ‘the elephant’ and in (5) the overt pronominal subject el ‘he’ will be preferentially co-indexed with the direct object pisica ‘the cat’.

(4) Elefantul, stropea motanul în timp ce pro mergea cu bicicleta.
    elephant-DEF splashed cat-DEF in time what pro went with bicycle-DEF
    ‘The elephant splashed the cat while it was riding the bicycle.’

(5) Elefantul, stropce motanul în timp ce el mergea cu bicicleta.
    elephant-DEF splashed cat-DEF in time what he went with bicycle-DEF
    ‘The elephant splashed the cat while it was riding the bicycle.’

The few available studies which have addressed the issue argue that antecedent preferences in Romanian observe Carminati’s PAH (e.g. Geber 2006, Pagurschi 2010). In a replica of Carminati’s (2002) study, Pagurschi (2010) tested antecedent preferences of null and overt pronominal subjects in Romanian in a variety of contexts. One of the tests investigated the interpretation of null and overt pronominal subjects in adverbial clauses (temporal and conditional) with two antecedents (of the same gender) in the main clause (Carminati’s experiment 2), as in (6):
(6) a. Ion îl vedea des pe George cind pro locuia în București.
   ‘Ion often met George when living in Bucharest.’

b. Ion îl vedea des pe George cînd el locuia în București.
   ‘Ion often met George when he was living in Bucharest.’

As can be seen in (6), in both cases the pronominal subject in the adverbial clause could pick any of the possible antecedents in the main clause.

Pagurschi (2010) administered a 10 sentence written questionnaire (5 with temporal clauses and 5 with conditional clauses) to 42 native speakers of Romanian (age range 20-50 years). Her results support Carminati’s hypothesis: 91.4% of the responses chose the subject in the main clause as the antecedent of a null subject. For overt pronominal subjects, 81.19% of the responses indicated the object in the main clause as a possible antecedent (Pagurschi 2010:77).

Several studies which investigated anaphora resolution in languages such as German, Dutch, Finnish and Hebrew show that when the subject in the embedded clause is a demonstrative pronoun, speakers have a clear bias towards less salient antecedents (Bosch et al. 2003, 2007, Kaiser and Trueswell 2004, 2008, inter alia). Though there is no study on antecedent preferences of demonstrative subjects in embedded clauses in Romanian, following what has been reported for other languages one can predict that in Romanian as well, the demonstrative in (7) will preferentially choose the object of the main clause as its antecedent:

(7) Elefantul, stropea motanul, în timp ce acesta mergea cu bicicleta.
   ‘The elephant splashed the cat while this one was riding the bicycle’.

This would also be in accordance with Ariel’s (1990) Accessibility Scale, on which both distal and proximal demonstratives occupy a position lower than null expressions and overt pronouns, i.e. demonstratives are lower accessibility markers:

(8) zero < […] < pronoun < […] < demonstrative < […]

This straightforwardly predicts that the bias towards a less salient antecedent should universally be stronger with demonstratives than with overt pronouns. The prediction is borne out by the data. For Romanian it has been argued that demonstratives have a very low degree of accessibility (Giurgea 2010:245). Therefore, in a context like the one in (9), the demonstrative in subject position in the adjunct clause will preferentially choose the DP in object position in the main clause (Vasile).

(9) Ion îl- a sunat pe Vasile cînd acesta era bolnav.
   Ion CL.AC.3SG.M has called PE Vasile when this was sick
   ‘Ion called Vasile when this one was sick.’
3. Previous studies on the acquisition of anaphora resolution

Most L1 acquisition studies report that preferences for null pronouns are adult-like early but they differ with respect to the acquisition of the interpretation of overt pronominal subjects. For example, in some languages children have adult-like antecedent preferences for null pronominal subjects but not for overt pronominal subjects. For the latter they over-choose a subject antecedent. This has been shown for Italian (Serratrice 2007, Greek (Papadopoulou et al. 2014) and Basque (Iraola et al. 2014). Similar results were found in Croatian. Kraš and Stipeć (2013) report an early adult-like antecedent choice pattern for null pronominal subjects but an overgeneralization of subject choice for overt pronouns; children up to the age of 11 show a weaker preference for the object when their choice is compared to that of adults. For European Portuguese the results differ from one context to the other. Silva (2015) investigates null and overt pronominal subject interpretation in complement clauses. Her results are in line with previous studies, revealing adult-like anaphora resolution for null subjects but not for overt subjects. Lobo and Silva (2015) investigate antecedent choice for null and overt pronominal subjects in temporal adjuncts in both anaphoric and cataphoric contexts. According to their results 5-year old monolingual speakers of European Portuguese do not distinguish between null and overt subjects with respect to antecedent choice. Children choose the subject as the preferred antecedent of null pronouns (though at a lower rate than adults) but they show no clear preference for the antecedent of overt pronouns.

These results are in line with the variation which has been reported in adult grammars, suggesting that differences in antecedent preferences among adult systems are reflected in different acquisition routes.

4. Antecedent preferences of null and overt subjects in child Romanian

4.1 Main research questions

The present study extends the investigation to child Romanian. To the best of my knowledge, this is the first analysis of anaphora resolution in an intra-sentential context in child Romanian. It is also the first one which brings demonstrative subjects into the picture. It addresses the following questions:

(i) Are the Romanian children’s antecedent preferences for null pronouns in an intra-sentential context adult-like at age 5?
(ii) Is there an asymmetry between the acquisition of antecedent preferences for null and overt pronouns in child Romanian, as reported for other languages?
(iii) Is there any difference between antecedent preferences for demonstrative pronominal subjects and overt pronominal subjects?

4.2 Participants

40 monolingual Romanian children took part in the study. They all attended a kindergarten in Bucharest. A group of adult controls also took part in the study. The details are summarized in Table 1.
In order to answer the questions in section 4.1 I used a binary picture selection task which included 5 warm up sentences, 12 test sentences and 3 control sentences. Each test sentence contained a main clause, as in (10), and a temporal adverbial clause (a while clause), as in (11):

(10)  Elefantul a stropit motanul ....
     elephant-DEF has splashed cat-DEF
     ‘The elephant splashed the cat ...’
(11)  ... în timp ce mergea cu bicicleta.
     in time what went with bicycle-DEF
     ‘while riding the bicycle.’

The test targeted exclusively forward anaphora, i.e. both possible antecedents preceded the pronouns. The pronoun (null/overt) was c-commanded by its possible antecedent. The task tested three conditions, with type of pronominal subject in the embedded clause as within-participant factor: null subject, overt personal pronoun, demonstrative. The test sentences in the three conditions are illustrated below:

(i) null subject (4 test sentences):

(12)  a. Elefantul a stropit motanul în timp ce pro mergea
      elephant-DEF has splashed cat.the in time what pro went
      with bicycle-DEF
      ‘The elephant splashed the cat while riding the bicycle.’
     b. Caracatita a vazut pisica in timp ce pro mergea cu bicicleta.
      octopus-DEF has seen cat-DEF in time what pro went with bicycle-DEF
      ‘The octopus saw the cat while riding the bicycle.’

(ii) overt personal pronoun subject (4 test sentences):

(13)  a. Elefantul a stropit motanul în timp ce el mergea cu
      elephant-DEF has splashed cat-DEF in time what he went with
      bicycle-DEF
      ‘The elephant splashed the cat while he was riding the bicycle.’
b. Carecătița a văzut pisica în timp ce ea mergea cu octopus-DEF has seen cat-DEF in time what she went with bicicleta. bicycle-DEF
   ‘The octopus saw the cat while she was riding the bicycle.’

(iii) overt demonstrative object (4 test sentences):

(14) a. Elefantul a stropit motanul în timp ce acesta mergea elephant-DEF has splashed cat-DEF in time what this went with bicicleta. bicycle-DEF
   ‘The elephant splashed the cat while this one was riding the bicycle.’

b. Carecătița a văzut pisica în timp ce aceasta mergea with bicicleta. octopus-DEF has seen cat-DEF in time what this went with bicycle-DEF
   ‘The octopus saw the cat while this one was riding the bicycle.’

The referents of the subject and of the object were all [+animate] and they performed non-specific pragmatically plausible activities. The subject in the embedded clause had the same phi-features (gender, number) as the possible antecedents, i.e. the subject and the object in the main clause.

The children were tested individually in a quiet room at their kindergarten. The adults were tested individually, in various places. I used a power point presentation. The participants heard a sentence and were required to choose the appropriate picture. Each slide presented two pictures: in one picture the matrix subject was performing the action, in the other picture the matrix object was performing the action. The pictures were drawn using Scratch. For example, for the test sentences in (12a) and (14a) the participants saw the two pictures in Figure 1 and they had to point to the one which they thought best matched the sentence.

Fig. 1. Pictures used in the task
For the test sentence in (12b) and (14b) the participants saw the two pictures in Figure 2 and they had to point to the one which they thought best matched the sentence:

![Fig. 2. Pictures used in the task](image)

### 4.4 Results and discussion

Carminati’s (2002) PAH predicts that, if Romanian children have the same anaphora resolution pattern as adults, they should preferentially choose the subject in the main clause as the antecedent of a null pronominal subject and the object as the antecedent of an overt pronominal subject. For adults, this is what was found in Pagurschi (2010) in a context like the one used in the present study.

The results for null subjects are summarized in Figure 3 and those for overt pronominal subjects are summarized in Figure 4. In both figures the children’s responses are compared to those of the group of control.

![Fig. 3 Results: null subject condition](image)

![Fig. 4. Results: overt pronoun condition](image)

The adults preferentially chose the subject in the main clause as the antecedent of a null pronoun, in accordance with Carminati’s hypothesis and with results reported in previous studies (Pagurschi 2010). The children did not show a subject bias. Their
responses were at chance. A standard two-sample t-test at the alpha = .05 level was conducted to test for a difference in scores between their subject and object responses. It revealed no significant difference between response type (subject: M = 1.8, SD = 1.2; object: M = 2.2; SD = 1.20), t(39) = −1.05, p = .3 (two-tailed).

The results of the present experiment differ from the ones reported in Pagurschi (2010) with respect to overt pronominal subjects. The adults in the control group showed no bias with personal pronouns. A standard two-sample t-test at the alpha = .05 level was conducted to test for a difference in scores between subject and object responses within the group. Their responses showed no significant difference between response type (subject: M = 2.1, SD = 1.6; object M = 1.8; SD = 1.5) t(47) = 0.93, p = .36 (two-tailed).

With adults the ratio subject/object is statistically different with null pronouns but not with overt pronouns, i.e. overt pronouns are less strongly correlated with object referents than null pronouns are with subject referents. The children did not show any bias either (see Figure 4). A standard two-sample t-test at the alpha = .05 level was conducted to test for a difference in scores between subject and object responses within each group. Children’s responses showed no significant difference between response type (subject: M = 2.07, SD = 1.06; object M= 1.92; SD = 1.05) t(39) = 0.45, p = .45 (two-tailed).

In the present experiment antecedent preferences for demonstratives have also been tested. The picture which emerges in this case is very clear with adults. They showed an obvious object bias, as expected (75% vs. 25%). This is similar to what was reported in previous studies for German, Finnish, etc. With the children one notices a slight preference for the object in the main clause as the antecedent of the demonstrative subject in the temporal adjunct (58% vs. 42%). A standard two-sample t-test at the alpha = .05 level was conducted to test for a difference in scores between subject and object responses. Children’s responses showed a very slight difference between response type (subject: M = 1.7, SD = 0.99; object M= 2.3; SD = 0.99) t(39) = −2.06, p = .05 (two-tailed). The difference shows that when the subject in the temporal adjunct is a demonstrative adults are categorical in their choice, whereas children show only a very slight bias with demonstratives. The results are summarized in Figure 5.

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**Fig. 5. Results: demonstrative subject condition**
The results show that preferences for null subject pronouns at age 5 are not adult-like in child Romanian. At first sight, the preferences for the antecedent of overt pronominal subjects are adult-like. This would suggest that in Romanian antecedent preferences of overt pronominal subjects develop earlier than antecedent preferences for null subjects. The Romanian data would differ from what has been reported for other languages, such as Croatian (Kraš and Stipeč 2013) and Italian (Serratrice 2007, Sorace et al. 2009). But the at chance pattern in both the null subject and in the overt pronoun conditions, in conjunction with the very small difference in the demonstrative subject condition suggest that the observed optionality is not target-like; it is an instance of developmental optionality. It is therefore plausible to assume that Romanian 5 year-olds do not make a distinction in terms of antecedent choice between null and overt pronominal subjects (see Table 2).

Table 2

<table>
<thead>
<tr>
<th>Group</th>
<th>Null pronominal subject</th>
<th>Overt personal pronoun subject</th>
<th>Demonstrative subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>children</td>
<td>no bias</td>
<td>no bias</td>
<td>weak bias</td>
</tr>
<tr>
<td>adults</td>
<td>subject</td>
<td>no bias</td>
<td>object</td>
</tr>
</tbody>
</table>

The results of the present study are similar to the data reported for European Portuguese in Lobo and Silva (2015) for null and overt pronominal subjects. These authors show that European Portuguese speaking children, at age five, do not distinguish between null and overt pronominal subjects either. They account for the findings in terms of processing demands. Indeed, given the fact that children acquiring null subject languages start using subjects target-like very early, the cause of the observed delay may not be syntactic in nature. For Romanian, the few available studies which investigated the acquisition of the null subject parameter show that children set the value of the parameter very early (Coene and Avram 2008, Avram and Coene 2010, Teodorescu 2014), in accordance with Wexler’s (1998) hypothesis according to which parameters of syntax are set early. Following this line, I assume that Romanian 5 year-olds know the syntax of subjects. Their non adult-like subject antecedent preferences might reflect inability to integrate knowledge of syntax and contextual cues (see also Sevcenco and Avram 2012 for a similar account of the delay in identifying the antecedent of Accusative clitic and exploit this cue in the comprehension of object relatives). Notice, however, that the cross-linguistic data reveal important differences among languages with respect to antecedent preferences. These differences have been reported both for adult grammars and for the acquisition route. This is why a competence account cannot be fully excluded. I leave this for further research.

The present experimental data revealed that Romanian adults show a “DP in subject position” bias with null pronominal subjects, as predicted by Carminati’s (2002) hypothesis. But the present results do not support the prediction of the same hypothesis.

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2 They do not investigate antecedent preferences for demonstrative subjects.
with respect to overt pronominal subjects. The adults did not choose the less salient antecedent in the case of overt pronominal subjects. In this respect, our results differ from those reported in Pagurschi (2010). This difference may be due to a task effect. For example, in the experiment used in the present study, the participants had to choose the appropriate picture which matched the sentence when seeing two pictures on the monitor. Pagurschi (2010) used a self-paced written questionnaire.

5. Conclusions

In the present study I investigated anaphora resolution in child Romanian. The starting point was Carminati’s (2002) Position of Antecedent Hypothesis which predicts, at least for Italian, that null subjects will preferentially choose a more prominent antecedent, which appears in a higher structural position, i.e. the subject in the matrix. Overt pronominal subjects will choose a less prominent antecedent, one which appears in a position lower in the structure of the sentence, i.e. the direct object. The results showed that at age five Romanian children do not have adult-like antecedent preferences with any of the subject types tested in the study: null pronominal subjects, overt pronominal subjects, demonstratives. They randomly chose the subject or the object as the antecedent of both null and overt pronominal subjects. With demonstratives, there was a bias for the direct object in the matrix, but much weaker than in the adults’ responses. Though apparently children responded like adults in the overt pronominal subject task, I interpreted the data as suggesting that the optionality of the children’s responses was not target-like and suggested that it reflected developmental optionality.

References
