Giorgia del Puppo, Margherita Pivi and Anna Cardinaletti

# 5 Elicited production of *who*-questions by school-aged Italian-speaking children

**Abstract:** This chapter reports the results of an elicited production experiment run with Italian-speaking children (6;3–10;4 year olds) and a control group of adults. Participants were induced to produce potentially ambiguous Who V DP questions, i.e. questions where a singular verb agrees with either the wh-element (subject-extracted questions) or a singular postverbal subject (object-extracted questions). With respect to adults, children employ a wider range of interrogative structures in addition to Who V DP ones, especially in the object condition. This is similar to the findings by Guasti, Branchini, and Arosio's (2012) study of the elicited production of unambiguous wh-questions in younger children (aged 3;11–5;11). We describe similarities and differences found across the two studies, and discuss the nature of the differences emerged between subject and object interrogative sentences and between children and adults. Guasti et al.'s analysis in terms of strength of agreement and interference is adopted to analyze the productions by the children we test. Due to their older age, our children produce two additional types of interrogative structures, namely passive and embedded interrogatives, not attested in Guasti et al.'s results.

## 1 Introduction

### 1.1 Wh V DP interrogative sentences in Italian

In Italian wh-questions, the distribution of subjects is restricted: a DP subject cannot occur between the wh-phrase and the verb, nor can it invert with the verb, as shown in the following object-extracted interrogatives:

(1)  *Chi    il    bambino    insegue?
     who    the   child       chases
     'Whom does the child chase?'

**Giorgia del Puppo, Margherita Pivi and Anna Cardinaletti**, Università Ca' Foscari Venezia

(2) *Chi    sta    il    bambino    inseguendo?
    who    is    the    child    chasing
    'Whom is the child chasing?'

To form a grammatical object wh-question, a lexical DP subject must be placed either in postverbal position[1] (3), or in left-dislocated position (4):

(3) Chi    sta    inseguendo    il    bambino?
    who    is    chasing    the    child
    'Whom is the child chasing?'

(4) Il    bambino,    chi    sta    inseguendo?
    the    child    who    is    chasing
    'The child, whom is he chasing?'

Moreover, since Italian is a null subject language, a null subject is licit when a non-subject constituent is extracted (5):

(5) Chi    sta    inseguendo?
    who    is    chasing
    'Whom is he chasing?'

Given that the interrogative pronoun who is singular, its role is potentially ambiguous between an object and a subject interpretation in sentences where the verb and the postverbal DP are also singular, as in sentence (3). On the other hand, (4) and (5) cannot be interpreted as questioning the subject: a dislocated object constituent is obligatorily resumed by a clitic pronoun in Italian, as in (6); as for null arguments, Italian does not license object-drop.[2]

(6) Il    bambino,    chi    lo    sta    inseguendo?
    the    child    who    him    is    chasing
    'The child, who is chasing him?'

When the subject occurs postverbally, subject-verb agreement can be a cue for disambiguation; in both (7) and (8), the postverbal DP is plural; (7) contains a plural verb agreeing with the postverbal DP; thus, the sentence can only

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**1** As regards the location of postverbal subjects in Italian, we follow Cardinaletti (2001, 2002, 2007) according to whom the subject occupies specvP and is destressed in situ.
**2** See Rizzi (1986) for a description of the few cases where null objects are permitted in Italian.

be interpreted as questioning the object; the opposite is true for the subject-extracted question in (8), which contains a singular verb agreeing with the interrogative constituent who.

(7) *Chi    stanno    inseguendo    i    bambini?*
    who    are    chasing    the    children
    'Whom are the children chasing?'

(8) *Chi    sta    inseguendo    i    bambini?*
    who    is    chasing    the    children
    'Who is chasing the children?'

## 1.2 Acquisition data on Italian *wh*-questions

*Wh*-questions are attested in Italian spontaneous child speech before the age of three (Guasti 1996, p. 263). Guasti (2000) elicited various types of adult-like interrogative sentences in 3 and 4 y.o. children, including cleft questions (9), object questions with postverbal subjects (10), and object questions with left-dislocated subjects (11).

(9) *Chi    è    che    aiuta    la    mamma?* (3;1)
    who    is    that    helps    the    mum
    'Who is it that helps the mum?'

(10) *Cosa    può    fare    il    cowboy?* (3;1)
    what    can    do    the    cowboy
    'What can the cowboy do?'

(11) *Luigino,    dove    non    può    andare?* (4;7)
    Luigino    where    not    can    go
    'Luigino, where can't he go?'

As for the comprehension modality, by administering a picture-matching task to 352 Italian-speaking children ranging in age from 3 to 11 years old, De Vincenzi et al. (1999) showed that children comprehend subject who-questions disambiguated by subject-verb agreement like the one in (8) far better than their counterparts involving object extraction, (7); such asymmetry is particularly remarkable from the age of 4 y.o. until the age of 9 y.o.

In a recent elicitation study, Guasti, Branchini, and Arosio (2012) analyzed preschool children's production of argument who- and which-questions disambiguated by subject-verb agreement, analogue to those tested by De Vincenzi et al.: children perform more accurately with subject who-questions as compared to object who-questions. Moreover, the authors report production of a wider set of adequate answering strategies alternative to the target sentences in the object condition: besides producing the targeted Wh V DP questions, (12), children often drop the subject DP (13) or place it in a left peripheral position (14) much more frequently than adults do, while hardly ever resorting to non-target-like questions in the subject condition:

(12)    *Chi     sporcano    gli    elefanti?*
       who    dirty-3PL    the    elephants
       'Whom are the elephants dirtying?'

(13)    *Chi     sporcano?*
       who    dirty
       'Whom are they dirtying?'

(14)    *Gli    elefanti,    chi    sporcano?*
       the    elephants    who    dirty
       'The elephants, whom are they dirtying?'

The aim of this study is to widen the findings reported by Guasti et al. (2012) in two respects: first, we investigate the elicited production of who-questions by older, school-aged Italian-speaking children, in order to explore similarities and differences manifested in development as compared to 3 and 4 y.o. children. Secondly, we test the elicited production of potentially ambiguous who-questions, i.e. questions that cannot be disambiguated by subject-verb agreement, as shown by the two possible readings of (15), reported in (15a) and (15b), in order to check what is the factor behind the difficulty of object Wh V DP who-questions with respect to subject who-questions, whether marked plural verb morphology or the postverbal position of the subject (note that 3rd person singular is an unmarked form in Italian, with no dedicated morphology)[3]:

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**3** We also aimed at determining whether prosodic properties may distinguish between the two interpretations of (15) in Italian, and at investigating children's ability to realize a so-called marginalization intonation which characterizes postverbal DPs in wh-questions (Cardinaletti 2001, 2002). In order to clarify the issue, a prosodic analysis of adults' and children's questions collected during the experiment has been conducted (Del Puppo 2016). The only study facing

(15)  *#Chi  sta  lavando  il  bambino?*
      who  is  washing  the  child

    a.  'Who is washing the child?'

    b.  'Whom is the child washing?'

If the complexity of Wh V DP object questions with respect to Wh V DP subject questions is due to the postverbal position of the subject in the former, the same difficulty should be expected in ambiguous and non-ambiguous object *who*-questions, despite the presence or absence of verb morphology.

Altogether, despite the older age of our participants and the different experimental materials employed in our experiment with respect to Guasti et al.'s study, the pattern of responses collected in the two experiments is very similar. Interestingly, some additional structures, namely passive and embedded interrogatives, emerge in our study, which are probably due to the older age of the children. Participants, the experimental task and the coding criteria are presented in the following section. Results are reported and discussed in section 3 and 4. Section 5 addresses the relevant conclusions.

# 2  Methods

In this section, we present the participants in our task, the experimental design, and the coding criteria.

## 2.1  Participants

113 typically developing children aged 6;3 to 10;4 took part in the production experiment. All children were native speakers of Italian, living and attending primary school in Venice. Eleven adults from Venice and its surroundings volunteered as control participants:

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the topic we are aware of is based on Dutch (Read, Kraak, and Boves 1980), and suggests that distinct intonational properties alone do not determine the interpretation of who-questions in absence of morphological or syntactic contrasts, though they can influence it. This raises the issue of the reliability of what has been said by our participants when an ambiguous string of words has been uttered (also see section 2.3).

**Table 1:** Participants across age groups

| Age Groups | No. of Participants | Mean Age | SD (months) |
|---|---|---|---|
| 6-Year-Old | 17 | 6;7 | 2 |
| 7-Year-Old | 32 | 7;4 | 3 |
| 8-Year-Old | 27 | 8;5 | 3 |
| 9-Year-Old | 37 | 9;6 | 4 |
| Adults | 11 | 23;6 | 44 |

## 2.2 Design and materials

The experimental design is based on Guasti et al. (2012). Participants were induced to ask who-questions to a puppet, named Poldo, which was present in the experimental setting. The experimental stimuli were shown in a PowerPoint presentation: both children and adults saw a set of pictures where either the agent or the patient of the event was hidden, depending on whether the targeted interrogative questioned the subject or the object constituent (Figure 1 and Figure 2, respectively). Simultaneously, participants listened to a prerecorded voice that described what was happening in the depicted event; the hidden, mysterious character was referred to as "someone".
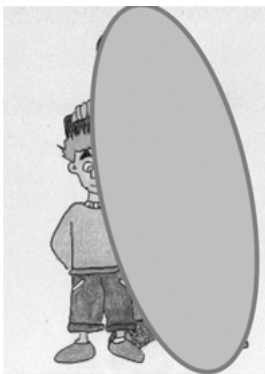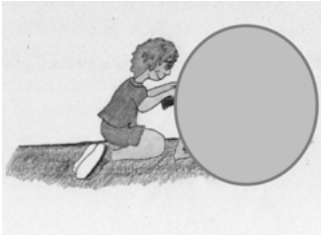


PUPPET: *Qui qualcuno sta pettinando un bambino.*
*E forse Poldo sa chi. Chiedilo a lui.*

'Here, someone is combing a child.
Maybe Poldo knows who. Ask him who'.

**Figure 1**

(16)  a.  TARGET QUESTION:  *Chi sta pettinando/pettina il bambino?*
                                    'Who is combing/combs the child?'

PUPPET: *Qui un bambino sta pettinando qualcuno.*
*E forse Poldo sa chi. Chiedilo a lui.*

'Here, a child is combing someone.
Maybe Poldo knows whom. Ask him whom.'

**Figure 2**

  b.  TARGET QUESTION:  *Chi sta pettinando/pettina il bambino?*
                                    'Whom is the child combing?'
                                    'Whom does the child comb?'

In order to find out who was hidden behind the circles/ellipsis, participants had to ask a question to the puppet Poldo[4]: participants were told that Poldo was a reindeer coming from Scandinavia; he didn't speak Italian, but wanted to learn the language; when participants asked him a question, he looked for the answer in his (complete) pictures and responded to the question trying to give the correct answer; participants were then shown the complete images and had to correct Poldo if he was wrong. Six transitive, reversible verbs were employed: *inseguire* 'chase', *lavare* 'wash', *pettinare* 'comb', *baciare* 'kiss', *accarezzare* 'caress', *salutare* 'greet'. The relevant DPs were all singular in number. Each verb was presented twice, once to elicit a subject question and once to elicit an object question, so as to collect six minimal pairs of superficially identical, potentially ambiguous interrogative sentences, as shown in (16a) and (16b). On the whole, participants were exposed to 12 stimuli eliciting who-questions; such stimuli were administered together with 24 stimuli eliciting restrictive relative clauses and 6 filler stimuli.

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**4** The procedure we employed slightly differ from the one used by Guasti et al. (2012): in Guasti et al.'s experiment, adults were expected to ask questions to an imaginary person, and not to a puppet. Moreover, the prerecorded lead-ins that participants heard were slightly different. The following one was aimed at eliciting an object question in Guasti et al.'s experiment (cf. Belletti & Guasti 2015: 212):
i. Look here. There are two bears that tie someone. He knows who. Ask him who.

## 2.3 Coding

In addition to Wh V DP questions, exemplified in (16a) and (16b), children employed other types of correct interrogative sentences; the main typologies are cleft questions (17), questions with left-dislocated subjects (18), object questions with subject drop (19), questions embedded under matrix, declarative verbs like *sapere* (know) (20), passive questions (21), and other types of appropriate sentences, like the one in (22):

(17)  *Chi  è  che  sta  pettinando  il  bambino?*
who  is  that  is  combing  the  child
'Who is it that is combing the child?'
'Who is it that the child is combing?'

(18)  *Il  signore,  chi  sta  salutando?*
the  man  who  is  greeting
'The man, whom is he greeting?'

(19)  *Chi  pettina?*
who  combs
'Whom is (he) combing?'

(20)  *Sai  chi  sta  pettinando  il  bambino?*
know-2SG  who  is  combing  the  child
'Do you know who is combing the child?'
'Do you know whom is the child combing?'

(21)  *Chi  viene  accarezzato  dal  bambino?*
who  comes  caressed  by-the  child
'Who is being caressed by the child?'

(22)  *Chi  c'è  qua  dietro  che  il  papà  sta  salutando?*
who  there-is  here  behind  that  the  daddy  is  greeting
'Who is there that daddy is greeting?'

Other types of responses, mostly occurring in the object condition, are combinations of the categories just mentioned; sentences like the ones from (23) to (25) have been counted as embedded questions; however, they include, respectively, a cleft structure with postverbal DP, a cleft structure with preverbal subject and a null subject:

(23)  *Potresti    dirmi    chi    è    che    saluta    il    signore?*
could-2SG  tell-me  who  is  that  greets  the  man
'Could you please tell me who is it that greets the man?'
'Could you please tell me who is it that the man greets?'

(24)  *Sai         chi    è    che    il    bambino    sta    lavando?*
know-2SG  who  is  that  the  child     is  washing
'Do you know who is it that the child is washing?'

(25)  *Mi       puoi        dire    chi    sta    baciando?*
to me  could-2SG  tell  who  is  kissing
'Could you tell me whom is (he) combing?'

Sentences like the cleft one in (26) have been classified as object questions with left-dislocated subject:

(26)  *Il    signore,  chi    è    che    sta    salutando?*
the  man       who  is  that  is  greeting
'The man, who is it that he is greeting?'

Furthermore, interrogative sentences like the ones in (27) and (28) have been counted, respectively, under the "passive" category and the "argument drop" category, despite the fact that they are cleft structures:

(27)  *Chi    è    che    viene    baciato    dal    bambino?*
who  is  that  comes  kissed  by-the  child
'Who is it that is being kissed by the child?'

(28)  *Chi    è    che    sta    lavando?*
who  is  that  is  washing
'Who is it that is washing?'
'Who is it that (he) is washing?'

Finally, passive questions like the one instantiated in (29) occurred in adult productions, in the subject condition:

(29)  *Da    chi        viene    inseguito    il    bambino?*
by  whom  comes  chased  the  child
'By whom is the child being chased?'

Sometimes, children gave responses that were classified as incorrect. These include production of undifferentiated forms like the one in (30), subject questions with object-drop, object questions produced instead of subject questions, (31), and other types of responses, such as (32) to (35).

(30) *Chi    è?*
    who    is
    'Who is it?'

(31) *Il    bambino, chi   sta  pettinando?*
    the   child      who  is   combing
    'The child, whom is he combing?'

(32) *Chi   è   che  il    bambino  lo  ba, bacia  quella  persona?*
    who  is  that  the  child     it  kis  kisses  that     person
    'Who is it that the child kis, kisses that person?'

(33) *Che cosa  sta  facendo  il    bambino?*
    what     is   doing   the  child
    'What is the child doing?'

(34) *Chi   è   che  il   bambino  pettina  qualcuno?*
    who  is  that  the  child     combs   someone
    'Whom is it that the child combs someone?'

(35) *Chi   sta  lavando  i    bambini?*
    who  is   washing  the  children
    'Who is washing the children?'

A reviewer raised the question, relevant to coding, as to how to distinguish subject from object questions when they are potentially ambiguous. What led us to claim that a question with the order Wh V DP is a subject or an object question is the fact that it was elicited in a subject or object condition. The reviewer is worried that if children made a mistake, it is not possible to detect it. Guasti et al.'s (2012) study reports some subject questions being uttered when object questions were targeted and vice versa, although no percentages are provided. Indeed, we only have evidence that our participants occasionally produced object questions (mainly via subject dislocation) instead of subject ones, as in (31) above. Since our participants are older in age and our results are comparable to those reported by Guasti et al. (2012), we believe that it is fair to

analyze subject and object questions produced in the relevant conditions as such, though tolerating some margin of error.[5]

# 3 Results

Overall, children's correct responses amount to 94% of the collected corpus, both for the subject and the object condition, and with no difference between age groups. The percentages of correct responses are given in Table 2. Only one occurrence of incorrect response was collected among adults.

**Table 2:** Percentages of correct Who-questions produced across participants (SD in percentage points)

| | CORRECT QUESTIONS | |
|---|---|---|
| | SUBJECT | OBJECT |
| 6 Y.O. | 95 (10) | 95 (10) |
| 7 Y.O. | 93 (14) | 94 (12) |
| 8 Y.O. | 93 (16) | 94 (15) |
| 9 Y.O. | 95 (12) | 95 (9) |
| Adults | 100 (0) | 98 (5) |

Out of the total amount of correct responses, Wh V DP questions like the ones instantiated in (16a) and (16b) represent the predominant typology of questions employed by adults, while children used a wider range of response types; this is shown in Table 3 and Table 4. The group of 9 y.o. children preferred the use of subject cleft questions to non cleft ones.

**Table 3:** Percentages of correct typologies of questions produced across participants in the subject condition

| | WH V DP | CLEFT | EMBEDDED | PASSIVE | OTHER |
|---|---|---|---|---|---|
| 6 Y.O. | 51 (47) | 40 (43) | 3 (3) | 0 | 1 |
| 7 Y.O. | 47 (45) | 25 (37) | 20 (13) | 0 | 1 |
| 8 Y.O. | 42 (43) | 32 (40) | 12 (3) | 2 (3) | 6 (18) |
| 9 Y.O. | 40 (40) | 45 (40) | 5 (17) | 0 | 5 (16) |
| Adults | 68 (43) | 9 (17) | 0 | 23 (33) | 0 |

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**5** See Schouwenaars, van Hout, and Hendriks (2014), who report a low percentage of agreement errors in object which-questions (less than 4%) in Dutch-speaking children aged 6;7 to 7;10 in an experimental paradigm similar to Guasti et al. and ours.

**Table 4:** Percentages of correct typologies of questions produced across participants in the object condition

|         | WH V DP    | SUBJ-TOPIC | CLEFT   | EMBEDDED | PASSIVE | OTHER   | SUBJ DROP |
|---------|------------|------------|---------|----------|---------|---------|-----------|
| 6 Y.O.  | 40 (35)    | 25 (32)    | 21 (28) | 2 (3)    | 0       | 2 (3)   | 5 (8)     |
| 7 Y.O.  | 28.5 (32)  | 18.5 (27)  | 13 (28) | 18 (17)  | 2 (10)  | 2 (5)   | 11 (22)   |
| 8 Y.O.  | 30 (35)    | 21 (30)    | 16 (25) | 10 (10)  | 1 (3)   | 5 (15)  | 11 (22)   |
| 9 Y.O.  | 35 (28)    | 16 (22)    | 26 (30) | 5 (18)   | 5 (15)  | 3 (12)  | 5 (18)    |
| Adults  | 86 (15)    | 7 (12)     | 0       | 0        | 3 (10)  | 2 (10)  | 0         |

Wh V DP questions were generally preferred by the adults with respect to the children. We performed a repeated-measure logistic regression analysis (Dixon 2008; Jaeger 2008) with software R (R Core Team 2013) by setting subjects and items as random factors in a mixed logit model (Baayen 2008). We set the probability of producing a Wh V DP question rather than another type of response as our dependent variable and age group as fixed factor. As a result, we found out that Wh V DP questions were produced more often by adults than children as a whole, in both conditions (subject questions: Wald $Z = 2.372$, $p = 0.01$; object questions: Wald $Z = 5.284$, $p < 0.001$). Moreover, by setting as our independent variable the targeted type of sentence, we found out that children preferred to use Wh V DP questions in the subject condition as compared to the object condition (on average, across groups, 45% questions in the subject condition vs. 33% in the object condition; Wald $Z = 6.293$, $p < 0.001$) and with no significant differences detected across age groups. The same is true as regards cleft questions (subject vs. object cleft questions: Wald $Z = 8.95$, $p < 0.001$). When Wh V DP questions and cleft questions are taken together, we observe that both children and adults produce comparable amounts of such questions in the subject condition, while fewer of such questions are found in child production in the object condition (Wald $Z = -3.607$, $p < 0.001$). With respect to adults, whose productions display less variation, children employed a larger variety of interrogative structures as regards object-extracted questions: these concern above all the use of cleft questions, questions embedded under a declarative verb, the omission of the subject constituent, and other adequate strategies of answers. On the other hand, adults produced some object questions with left-dislocated subjects, a strategy employed by children as well. Most object cleft questions produced by children contained postverbal subjects, as in (17); however, preverbal subjects are allowed in Italian cleft questions, as (36) shows:

(36)  *Chi    è    che    il    bambino    sta    pettinando?*
      who    is    that    the    child      is    combing
      'Who is it that the child is combing?'

Matrix object cleft questions with preverbal subject occurred 16% of times in children's productions, out of the total amount of the matrix cleft questions collected in the object condition (21/131). The same is true for embedded cleft questions, like the one given in (24): children produced 6/15 embedded cleft questions with preverbal subjects. As a whole, as Table 5 shows, children produced a larger amount of interrogatives with lexicalized preverbal or left-dislocated subject as compared to adults, namely 25% vs. 7% (Wald Z = 2.082, p < 0.05); such finding will be of particular interest for the analysis of the results given in next section.[6]

**Table 5:** Percentages of questions with preverbal/left dislocated subject in the object condition

|  | PREVERBAL SUBJECT |
|---|---|
| 6 Y.O. | 32 (32) |
| 7 Y.O. | 21 (27) |
| 8 Y.O. | 26 (30) |
| 9 Y.O. | 23 (27) |
| Adults | 7 (12) |

Finally, children sometimes committed false starts or rephrased their sentences, as exemplified in (37):

(37) *Chi è che, chi è che sta, il bambino chi sta baciando?*
who is that who is that is the child who is kissing
'Who is it that, who is it that is, the child, whom is he kissing?'

Interestingly, this concerns 16% of all object questions but only 1% of subject questions. Adults' false starts and sentence rephrasing concerns 3% of subject questions and 6% of object questions; as a whole, adults rephrased their sentences less frequently than children (Wald Z = −2.221, p < 0.05).

# 4 Discussion

When induced to produce who-questions, Italian-speaking children aged 6 to 10 utter a high amount of accurate, simple Wh V DP and cleft interrogatives when the subject constituent is questioned. When an object constituent is extracted, a larger variety of answering strategies are employed, namely questions with left-

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**6** The reviewer who asked about coding (see section 2.3) also asked to limit the analysis to only non-ambiguous questions, by removing all questions with the order Wh V DP, in order to check whether there is any developmental change. Data reported in Table 5 do not display any significant change, although the highest percentage of preverbal or dislocated subjects concerns the youngest children.

dislocated and null subjects, questions embedded under a matrix, declarative verb, passive questions and other types of questions. With respect to children, adults present less variation as far as the object condition is concerned: they do not use cleft questions, embedded questions or other types of interrogatives, nor do they omit the subject; however, they allow the subject to be left-dislocated. When all questions containing a preverbal or a left-dislocated subject are considered, one observes that children choose them more frequently than adults. Furthermore, even though children do not produce less accurate object questions than subject questions, they produce false starts by rephrasing their sentences more often when an object interrogative element is extracted and more frequently than adults. All things considered, some kind of subject-object asymmetry seems to be present in child data, with object interrogatives with postverbal subjects sometimes being avoided in favour of structures containing preverbal subjects. It is remarkable that no significant differences among age groups emerge in our study. As is noted by Guasti et al. (2012), though, this unexpected finding somehow mirrors the pattern found in comprehension of unambiguous questions by De Vincenzi et al. (1999), who notice a significant change only from age 10 on, with object interrogatives with postverbal subject being understood far better.

Our findings are very similar to Guasti et al.'s study in some respects: the authors report production of a wider set of answering strategies alternative to the target sentences in the object condition by preschool-aged children: in addition to Wh V DP questions, young children drop the DP subject or place it in a left peripheral position more frequently than adults do, while hardly ever resorting to non-target-like questions in the subject condition.

Important differences are also detected: with respect to younger children, we observe an increase in the rate of accuracy in older children's answers, a decrease in object questions with subject omission, a greater amount of cleft questions, and the emergence of embedded and passive questions, probably due to the older age of our participants. We also observe a difference in the adult pattern: our adults produce more passive questions in the subject condition, while the adults participating in Guasti et al.'s experiment favour passive questions in the object condition.

Guasti et al. (2012) interpret young children's subject-object asymmetry, which manifests itself in terms of a higher accuracy rate in subject questions and a larger variety of interrogative structures in the object condition, as the consequence of a greater level of difficulty posed by object-constituent extraction when a postverbal subject is present in the sentence, as is allowed by Italian syntax. Note that such asymmetry is not expected under Friedmann, Belletti, and Rizzi (2009) well-known account according to which children have difficulties in comprehending and producing structures where a moved element

and a subject intervening between the first and the last merged position of that element share a lexical restriction, as in object-extracted restrictive relative clauses with DP subjects, (38), and which-questions, (39):

(38)  Tocca il bambino che il signore saluta <il bambino>
      Touch the child that the man greets <the child>

(39)  Quali bambini saluta il signore <quali bambini>?
      Which children does the man greet <which children>?

In who-questions, the interrogative element is not lexically restricted; therefore, children should not find who-object questions particularly problematic to compute. According to Guasti et al., the subject-object asymmetry found in production in Italian-speaking children's questions is better accounted for by taking the distinction between subject-verb (SV) and verb-subject (VS) agreement into consideration, and by conceiving the object questions produced alternatively to the target ones by young children, i.e. questions with null and dislocated subjects, as means to avoid a configuration containing a postverbal subject. The account is based on the generalization, discussed in Guasti and Rizzi (2002), that SV agreement is more robust than VS agreement crosslinguistically: in languages that possess the relevant morphology, when a DP subject occurs in a position higher than the verb, the morphological expression of agreement is compulsory; when not, languages may not express morphological agreement between the verb and the postverbal DP, and agreement is more prone to variation, that is, it is "weak". Guasti et al. (2012) implement this theoretical notion of robustness of agreement by applying Franck et al.'s (2006) syntactic analysis of attraction to children's performance in wh-questions. According to Franck et al. (2006), agreement consists of two sub-processes, AGREE and Spec-head. Through AGREE, number and person features of the subject in its thematic position are copied onto an "AgrS" node; then, the verb is assumed to move to AgrS to receive its morphological specification (Figure 3).
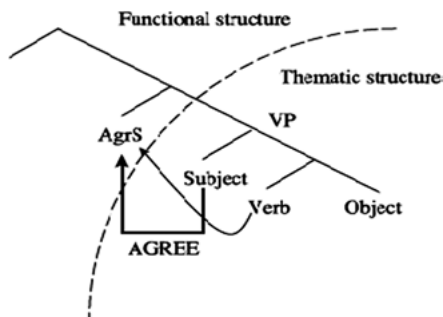


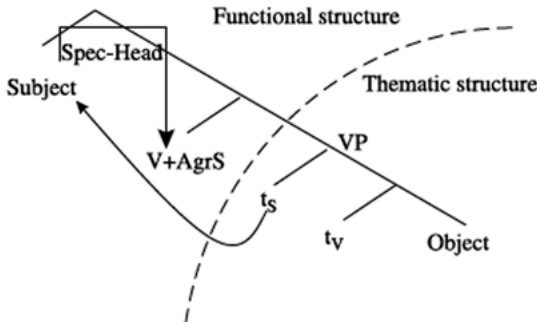**Figure 3:** AGREE (Franck et al. 2006:180)

**Figure 4:** Spec-head agreement (Franck et al. 2006:181)

In languages displaying SV order, the subject moves out of VP to Spec AgrS, giving rise to a local Spec-head relationship (Figure 4). Crucially, Franck et al. assume that the sharing of featural values established by AGREE gets further checked in the local Spec-head configuration. Thus, rephrasing Guasti and Rizzi (2002), Franck et al. propose that the morphological manifestation of agreement is more stable when AGREE is associated with movement of the subject to Spec AgrS, because the relevant features are checked twice. In such cases, agreement manifests itself as SV agreement; superficial VS agreement, on the other hand, is realized solely by AGREE. Guasti et al. (2012) make use of such account to explain why object questions containing a postverbal subject DP may be particularly challenging: when an object constituent is extracted in a question, the object copy interferes in the AGREE relation between the subject in its thematic position and AgrS; if agreement is weak, i.e. the subject DP is postverbal, the object copy may transfer its features into AgrS without the possibility for a Spec-head agreement relation between the subject and the verb to "repair" the error; this gives rise to an attraction error (Figure 5), like the one instantiated in (40), where it is the object interrogative constituent that ultimately agrees with the verb, and not the postverbal subject:
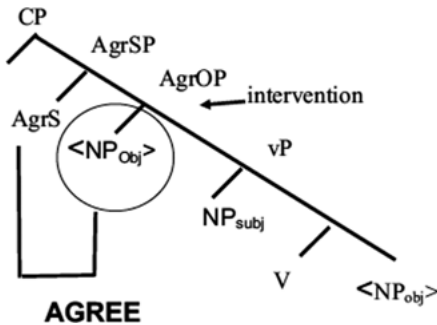


**Figure 5:** Attraction (Guasti et al. 2012: 205)

(40) *Chi   sporca   gli   elefanti?*
  'Who is dirtying the elephants?'

Target sentence:   *Chi sporcano gli elefanti?*
        'Whom are the elephants dirtying?'

Crucially, Guasti et al. (2012) point out that interference is the source of difficulty for young children (and, to a lesser extent, for adults too). To avoid VS agreement configurations in wh-questions and, ultimately, attraction errors, object questions with null or dislocated subjects would be employed, because they allow for double feature checking, involving both AGREE and Spec-head relationships.[7] Indeed, following Cardinaletti (2004, 2007), in object questions with null subjects (41) and left-dislocated subjects (42), the argumental subject *pro* occurs preverbally, and agreement is therefore strong:

(41) [$_{FocusP}$   chi [$_{AgrSP}$   pro$_s$   lavano$_v$ [$_{vP}$ t$_s$ t$_v$ <chi> ]]]
        who       they   wash
  'Who do they wash?'

(42) [$_{TopicP}$  i    bambini [$_{FocusP}$   chi [$_{AgrSP}$   pro$_s$   lavano$_v$  [$_{vP}$ t$_s$ t$_v$ <chi> ]]]]
        the   children       who       they   wash
  'Who do the children wash?'

This account can explain the pattern of responses found in young children's productions of *wh*-questions disambiguated by subject-verb agreement, and it would be tempting to apply the same line of reasoning to our data as well. Indeed, a subject-object asymmetry is found in our data in both target and cleft *wh*-questions. In addition to object questions with null subjects or left dislocated subjects, cleft questions, embedded cleft questions and other types of questions with preverbal subjects, like the ones given in (34), (22) and (24), could be seen as attempts made to place the subject preverbally[8,9]. Furthermore, more false

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**7** The same approach has been successfully used by Volpato (2010) and Volpato and Vernice (2014) to account for the different production of object relative clauses with preverbal and postverbal subjects.

**8** One may argue that the nature of subject omission in object questions, adopted by children but disallowed by adults, is pragmatic in nature: children would choose to omit the DP subject constituent because it is underinformative, i.e. it can be recovered by the experimental context (see Serratrice 2005), while adults would be more committed to the hearer. For this reason, we decided to exclude object questions with null subjects from the count; even excluding them, our children produce a higher amount of structures with preverbal subjects than adults (see Table 5).

**9** For a discussion on the syntactic structure of interrogative clefts, see Belletti (2012; 2015). The type of interference taken into account in our study can apply to interrogative clefts containing preverbal subjects as well.

starts and sentence rephrasing occur when questioning the object constituent in our children's productions, suggesting that extracting the object might be more difficult than extracting the subject also in questions where agreement does not play any role in disambiguating the syntactic functions of the interrogative element and the postverbal DP.

Only one finding is in contrast with Guasti et al.'s results and expectations: the adults they tested produced passive questions in the object condition, which are interpreted as the strategy adopted by adults in order to overcome interference of the object copy, and, consequently, attraction. 3 and 4 y.o. children do not make use of this strategy because they are too young, but the authors expect older children to produce passive questions like adults. However, our school-aged children only employ 3% passive questions in the object condition. Moreover, recall that who-questions in our study were elicited together with argument relative clauses: the very same children produced a substantial amount of passive relatives instead of the targeted gap object relatives,[10] which means that the passive structure is perfectly available to them as an avoidance strategy. Yet, these children only rarely resorted to the passive when induced to produce object questions. Secondly, the adults taking part in our experiment show an asymmetry going in the opposite direction: more passive questions are produced in the subject condition. These facts suggest that passive is not to be considered as an avoidance strategy of attraction in who object questions.[11]

# 5 Conclusions

A production experiment run with Italian-speaking children (aged 6;3–10;4) and a control group of adults aiming at eliciting potentially ambiguous who V DP questions, i.e. questions superficially ambiguous between a subject and an object reading, reveals some differences between the subject and the object experimental conditions. Wh V DP object questions are more often replaced by

**10** See Pivi, Del Puppo, and Cardinaletti (this volume), who report the data produced by the very same group of participants, "G4", and deal with the issue concerning passive relatives used instead of gap object relatives.
**11** The lower rate of passives employed in who-questions with respect to those employed in relative clauses is expected under Friedmann, Belletti, and Rizzi (2009) Relativized Minimality account. Consistently, in Guasti et al.'s study, passivization is used more frequently by adults when the target is an object question introduced by the operator which NP, which is lexically restricted, rather than who. It could be maintained that other avoidance strategies different from turning who object questions into who subject questions are favoured by children, when trying to avoid attraction phenomena: omitting or dislocating the subject is preferred.

other types of interrogative structures than subject questions in children. These alternative strategies share the property of containing a preverbal subject which is in Spec-head configuration with the verb rather than a postverbal subject. This phenomenon is not present in adults' production in the same percentages (children 25% vs. adults 7%) As a whole, school-aged Italian-speaking children seem to still have some difficulties with interrogatives containing postverbal subjects. Results are compared with the findings by Guasti, Branchini, and Arosio (2012): the authors find similar results in preschool-aged children by eliciting wh-questions disambiguated by subject-verb agreement. In order to explain the subject-object asymmetry emerged in children and the divergent performance displayed by adults, an explanation in terms of strength of agreement and interference, in line with the one proposed by Guasti et al., could be applied to potentially ambiguous interrogatives as well, and still, even though to a lesser extent, to older children's productions.

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