Asymmetries in Acquisition of Interrogative Sentences

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The Role of Intervention and Interference

By

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"[...] the fundamental empirical problem of linguistics is to explain how a person can acquire knowledge of language."

(Chomsky 1973 – *Conditions on transformations*)

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I knew I would do research in linguistics right from the first Generative Grammar courses I took at the University of Bucharest many years ago. I would like to take a moment and express my gratitude to the Professors from the English Department whose passion and dedication were simply contagious.

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List of Abbreviations

Agr: Agreement
AgrO: Agreement object
AgrP: Agreement phrase
AgrS: Agreement subject
AIA: AGREE Interference approach
C: Complementizer
CP: Complementizer Phrase
CRM: Child Relativized Minimality
D: Determiner
D-linking: Discourse linking
DP: Determiner phrase
LF: Logical Form
NP: Noun Phrase
P: Preposition
PP: Preposition Phrase
PF: Phonological Form
RM: Relativized Minimality
SAI: Subject-Auxiliary Inversion
Spec: Specifier
T: Tense
TP: Tense Phrase
V: Verb
v: little V
vP: little v Phrase
VP: Verb Phrase

CHAPTER 1

ASYMMETRIES IN THE ACQUISITION OF *WH*-QUESTIONS

Studies on the acquisition of wh-questions often focus on the computational complexity of these structures. They involve movement and barriers to movement, locality conditions, dependencies between displaced constituents and the position in which they first merged, discourse linking (or absence thereof), i.e., a fine-grained blend between principles of Universal Grammar and language specific properties. For children to produce and understand a wh-question they must know "the relevant syntactic structures and have sufficient processing resources to hold in mind the questioned object for the duration of the sentence" (Seidl, Hollich, and Jusczyk 2003: 242). Despite the complexity which is involved in the production and the comprehension of these syntactic structures, children begin to produce them before age 3;0 and they know the rules involved in *wh*-question formation very early (see, e.g., the discussion in O'Grady 1997, in Guasti 2016, or Roeper and de Villiers 2011). But not all *wh*-questions are equally difficult. Simple *wh*-questions (1) are acquired before long-distance *wh*-questions (2) and before multiple *wh*-questions (3):

(1) "**Who** gave John a book? [English]

(2) Cine crezi că mănâncă un măr? [Romanian]
who think that eats an apple
'Who do you think that eats an apple?'

(3) **Koj kogo** vižda? [Bulgarian]
who whom sees
'Who sees whom?'" (from Rudin 1988: 449)

Within long-distance questions, object *wh*-questions emerge earlier than subject *wh*-questions (Stromswold 1990, Jakubowicz and Strik 2008, see also the discussion in Roeper and de Villiers 2011). Acquisitionists observed that generally, adjunct *wh*-questions emerge slightly earlier than subject and object *wh*-questions (Klima and Bellugi 1966, Bloom, Merkin

and Wootten 1982), non-D-linked *wh*-questions are acquired earlier than D-linked ones (Avrutin 2000, Goodluck 2009) and subject *wh*-questions seem to be less problematic than object *wh*-questions (see, for example, the studies presented in O'Grady 1997).

The acquisition of *wh*-questions seems to involve several asymmetries between one type of *wh*-question and another. Some of these asymmetries have been discussed in terms of the difficulty which arises from the fact that *wh*-questions involve non-local dependencies. These are the result of the operation Move: the fronted *wh*-phrase occurs in an A-bar position in the left periphery of the clause, but it is interpreted in relation to the gap/trace/unpronounced copy (various labels reflect the different approaches to movement within generative studies) left behind in the position in which the *wh*-phrase first merged and was assigned a theta-role. For example, in the Romanian object *wh*-question (4) below, the *wh*-phrase has moved from its VP-internal position, in which it received a theta-role from the lexical verb whose argument it is, to a position in the left periphery, where it has the role of an interrogative operator. It has left behind an unpronounced copy:

(4) **Pe care copil** l- a desenat Maria **<pe care copil>** ?
PE which child CL.3.SG AUX drew Maria <PE which child>?
'Which child do you think that Maria drew?'

Pe care 'ACC which' is interpreted in its VP-internal position, where it received a theta-role, and the copy left behind gets its reference from the overt *wh*-phrase. Such dependencies are vulnerable not only because they involve a non-local relationship but also because non-locality involves possible interveners. In (4) above, *Maria*, the subject of the clause, intervenes between the *wh*-phrase and its unpronounced copy:

(5) **Pe care copil** l-a desenat Maria **<pe care copil>**?

The interpretation of such sentences is difficult for at least two reasons. Firstly, because *pe care copil* 'ACC which child' appears in one position, but it must be interpreted in (relation to) another position. Secondly, because the search for the other member of the dependency is hindered by an intervener, the subject. As I will show later in this chapter, only some interveners really affect this search. As Rizzi (2009) puts it:

> "[...] language [...] is very sharp, very precise. It gets implemented in an extremely sharp manner, only certain things count as interveners [...]." (Rizzi 2009:33)

More recently, Chomsky (2009), talking about Rizzi's study on locality, suggested that it is not implausible to assume that the search in A-bar dependencies may involve third-factor phenomena. This is his answer to Rizzi's question of how much of this search "is in UG and how much of that is derivable from external general principles" (Rizzi 2009: 33):

> "[...] minimal search could be – we have to prove this, you have got to show it–in principle it *could* be just a law of nature. It is just the best way of doing anything. And you would expect to find it in efficient patterns of foraging, all sorts of neural structures, and so on. If that can be worked out, then you *would* reduce it all to third-factor principles." (Chomsky 2009:35)

This raises the question of how much of the acquisition of *wh*-questions is guided by principles of Universal Grammar, how much it is determined by properties of the target language and how much by third-factor principles.

1.1 From syntax to language acquisition

From the perspective of the child acquiring a language, the inventory indicates that the acquisition of the syntax of *wh*-questions requires:

(i) acquisition of the lexical and syntactic properties of *wh*-expressions.
(ii) evaluation of the strength of the *wh*-feature on C, i.e., to identify if *wh*-movement is overt or covert in the target language, in conjunction with the availability of long-distance *wh*-movement (and possibly with availability of preposition stranding).
(iii) identification of the landing site of the *wh*-phrase (Spec IP or the C-domain) in conjunction with identification of whether I to C movement is available.
(iv) identification of the availability/non-availability of multiple fronting of *wh*-questions in the target language, in conjunction with identification of the landing site of all the fronted *wh*-phrases.
(v) identify the way in which universal constraints on *wh*-movement interfere with language specific properties.

Quite a lot. It therefore comes as no surprise that, although *wh*-questions are attested early, before age 3;0, they are not always produced or

comprehended adult-like. For Italian, for example, Guasti (1996 summarized in Belletti and Guasti 2015), reports findings from the investigation of the naturalist production of *wh*-questions in five longitudinal corpora (the age range of the children 1;7–2;11) as well as experimental findings from a group of 11 Italian-speaking children (age range 3;1–4;8). She reaches the conclusion that Italian children show mastery of question formation rules as early as age 2;0: no *wh-in situ* has been attested, there is I to C movement and the produced questions observe the *Wh*-Criterion. But some questions seem to be acquired later. 4-year-olds produced more subject than object *who* questions and more *who* questions than *which* questions (Guasti, Branchini and Arosio 2012). A subject-object asymmetry with *who* questions is also reported in comprehension studies: comprehension of reversible object *wh*-questions is delayed in comparison to reversible subject *wh*-questions (De Vincenzi, Arduino, Ciccarelli and Job 1999, in Belletti and Guasti 2015). Also, in some groups, an asymmetry between D-linked and non-D-linked object questions was attested, with the latter being better comprehended.

The studies on the acquisition of *wh*-questions in English, however, offer a different early error pattern. Radford (1990) provides data which show that in the spontaneous speech of English children, *wh*-question formation does not involve *wh*-movement, not even in imitation. Their answers to *wh*-questions also show that they have problems understanding them. Such results are different from what has been found not only in Italian, but also in other Romance languages, such as Catalan, European Portuguese, and Spanish (see the discussion in Roeper and de Villiers 2011). Children acquiring *wh-in situ* languages acquire them earlier, which may indicate an early preference for Merge over Move (Roeper and de Villiers 2011).

Summing up, the findings reported in various studies reveal two important facts: (i) there is a gradient of difficulty, with only some *wh*-questions being subject to delayed acquisition, and (ii) there is cross-linguistic variation with respect to the acquisition of *wh*-questions with respect to the availability of some early errors.

Interestingly, according to some studies, comprehension seems to precede production (Seidl, Hohlich and Jusczyk 2003). Other studies show that production of object *wh*-questions is better than comprehension of the same question type (Belletti and Guasti 2015).

Two asymmetries in the acquisition of *wh*-questions have received special attention in the literature: (i) subject vs. object *wh*-questions; (ii) D-linked vs. non-D-linked *wh*-questions.

1.1.1 Asymmetries in the acquisition of argument *wh*-questions

Research on the acquisition of argument *wh*-questions has focused on the subject-object asymmetry both based on longitudinal and of experimental data (Ervin-Tripp 1970, Tyack and Ingram 1977, Wilhelm and Hanna 1992, Guasti 1996, Yoshinaga 1996, Seidl, Hohlich and Jusczyk 2003, Jakubowicz and Gutierrez 2007, among others). The picture which emerges from most of the available studies is that subject *wh*-questions (6a) are acquired earlier than object *wh*-questions (6b) (O'Grady 1997 for an overview, Guasti 2002)

(6) a. Who walked the dog?
b. What did Bob read?

This asymmetry was attested both with typically developed (TD) and with impaired populations. Several studies present results which show that for Specific Language Impairment (SLI) children, subject *wh*-questions are also easier than object *wh*-questions (van der Lely and Battell 2003, Friedmann and Novogrodski 2011).

This asymmetry overlaps with the one between D-linked and non-D-linked *wh*-phrases. According to some studies, D-linked questions are acquired later. More recently, however, it has been argued that actually the subject-object asymmetry only holds with D-linked *wh*-questions, i.e., only D-linked object *wh*-questions are more difficult to acquire.

1.1.2 Main approaches to the subject-object *wh*-question asymmetry

1.1.2.1 A distance account

One early account of the subject-object *wh*-question asymmetry builds on the distance between the landing site of the displaced *wh*-word and the unpronounced copy in its first Merge position, where it is assigned a theta-role by the lexical verb. In subject *wh*-questions, according to early analyses, the *wh*-word remains in the canonical subject position (e.g., Gazdar 1981 in O'Grady 1997), which would straightforwardly explain why these questions are easier to parse. If subject *wh*-questions do not

involve movement, and if it is true that children acquire non-movement structures before structures which involve movement, this analysis can explain why subject *wh*-questions are acquired earlier. This analysis, however, has been abandoned in favour of a movement analysis. According to the Principles and Parameters analysis, the *wh*-phrase moves to the left periphery of the clause irrespective of its syntactic function. But the distance between the *wh*-phrase and the lower unpronounced copy is shorter when the *wh*-phrase is a subject. The *wh*-phrase moves from the Spec of IP, the canonical subject position, to Spec CP, without passing over any intervening XP. This movement does not affect the order of the constituents either.

When C has a *wh*-feature, it will act as a Probe searching in its c-command domain for a Goal. It will attract the closest constituent which matches its *wh*-feature. What is directly relevant to the present discussion is that object *wh*-questions involve a longer distance between the displaced *wh*-phrase and the unpronounced copy left behind, with which it forms a dependency; the object *wh*-phrase moves to a position which is far away from the one in which it is assigned a theta-role. In this case, movement is over the XP subject, an element which may disrupt the dependency relation between the *wh*-phrase and the low unpronounced copy.

There are, then, at least two factors which could explain the differences between subject and object *wh*-questions: distance and intervention. They can also explain why object *wh*-questions are more difficult to parse, for both children and adults, in comparison to subject *wh*-questions.

Such an analysis predicts that subject *wh*-questions are easier to acquire than object *wh*-questions across the board. This relatively neat picture, however, is challenged by studies which report early acquisition of object questions (Klima and Bellugi 1966) or concurrent acquisition of subject and object *wh*-questions (Stromswold 1995). It is also in contradiction with more recent acquisition studies which show that the subject-object asymmetry is found only with D-linked *wh*-questions:

(7) a. Which boy walked the dog?
b. Which dog did the boy walk?

Importantly, such data show that distance, or distance alone, cannot explain the asymmetry, suggesting that intervention might actually be the key factor (Friedmann, Belletti and Rizzi 2009).

1.1.2.2 An intervention effect account

Child Relativized Minimality in a nutshell

Rizzi (1991), as mentioned earlier in this chapter, made the fundamental observation that a structural relation must be local; in *wh*-question formation, for example, if another element which bears a *wh*-feature intervenes between the displaced *wh*-phrase and its unpronounced copy, movement will no longer be allowed. Compare (8a) and (8b) below. In (8a), *wh*-movement can take place; but (8b), where *who,* a *wh*-feature bearing element, intervenes between *where,* a *wh* element*,* and its copy, is illicit:

(8) a. Where did you say Bob was <where>?
b. *Where did you say **who** was < where> ?

> The principle of Relativized Minimality "severely limits the portion of structure within which a given local relation is computed." (Rizzi 2004: 223)

Following this fundamental observation, Grillo (2008) argued that whenever a constituent must move over a similar one, if the processing load is heavier, as in the case of agrammatic Broca's aphasia, it may violate the locality of Relativized Minimality. The chain formed between a displaced element and its unpronounced copy can be formed if there is a difference between the array of features associated with the moving element and those associated with the intervener. The instantiation of the chain between the first Merge position and the landing position will be blocked when no additional feature (*wh*, person, number, gender) distinguishes between the moving phrase and the intervening one. Deficient processing ability results in a compromised representation (underspecification) of the morphosyntactic features associated with syntactic elements, generating minimality effects.

Locality is relevant for mental computation. This view also assumes that intervention is computed in terms of morpho-syntactic features. The internal structure of the members of the dependency relationship determines their ability of moving over 'similar' intervening elements as well as their potential of 'damaging' interveners.

Distance alone might not be able to explain the asymmetry in acquisition between subject and object *wh*-questions. The core ingredient is intervention, together with the array of morpho-syntactic features of the

moving element, which will finally determine its ability of moving over potential interveners.

But the adult system can cope well with structures which involve intervention, such as object relatives. This raises the question of why Relativized Minimality is not always violated in a configuration like the one below, where there is an intervener (the one in bold) and where there is similarity between the features of this intervener and those of the displaced *wh*-phrase:

(9) D NP [+R, +NP] ..... **D NP** ..... <D NP>

Friedmann, Belletti and Rizzi (2009) assume that Relativized Minimality produces the effects expressed below:

(10) " a. +A .... +A.... <+A> *
b. +A+B .... +A.....<+A+B> ok"
(Friedmann, Belletti and Rizzi 2009: 84)

In this format, the intervener has the effect of blocking an A-bar dependency only when it fully matches the specification of the attractor. However, in the adult system, there is the option of reverting to the configuration in (49b) if the attractor is more richly specified in featural terms than the intervener and blocking does not occur.

The interplay between the features of the moving constituent and those of the intervener results in gradients of intervention. More 'similarity' between the two feature sets determines difficulties in the production and comprehension of dependencies. But children adhere to a strict version of Relativized Minimality. The adult principle may be satisfied when the target's specification properly includes the intervener's specification in a superset-subset relation. The child principle is violated in this case:

(11)

			Adult grammar	Child grammar	
" a. +A ...	+A...	<+A>	*	*	(identity)
b. +A,+B ...	+A...	<+A,+B>	ok	*	(inclusion)
c. +A	+B....	<+A>	ok	ok	(disjunction) "

(Friedmann, Belleti and Rizzi 2009: 84)

In the case of questions with bare *wh*-operators, the disjointness requirement is clearly satisfied: no intervention effect is observed. However, in questions with lexically restricted *wh*-operators, the intervening subject shares part of the specification of the operator, the

lexical restriction, and strict Relativized Minimality applies to block the relation connecting the target and its trace. Thus, children cannot understand/produce object *wh*-questions with a lexically restricted operator.

Summing up, Child Relativized Minimality (Friedmann, Belletti and Rizzi 2009) argues that the difficulty of processing A-bar dependencies can be accounted for in terms of the locality principle of Relativized Minimality and the identity of the [+NP] feature. The intervener blocks the local A-bar relation. Immature systems can only compute configurations in which the moved phrase and the embedded subject differ maximally. In child grammar extraction of an object over an intervening NP is only possible when the specification of the intervener is disjoint from the element that moves. Thus, children perform better with those dependencies headed by a bare [-NP] element. Also, Child Relativized Minimality predicts better results in the production of subject relative clauses and subject *wh*-questions with lexical restriction.

Friedmann, Belletti and Rizzi (2009) also suggest that the child's more restrictive version of Relativized Minimality may be motivated by a difficulty in computing subset/superset relations. Notice, however, that computing subset/superset relations is not specific to language; as such it might be a 'third-factor'.

On the gradience of intervention

Several studies have revealed that beside the NP feature, gender and number can influence the comprehension of headed A-bar dependencies. Mismatch of these features improves the processing of A-bar structures, but in a different way from one language to another. For Italian, number mismatch is relevant. For Hebrew, where gender is a feature of Inflection, gender mismatch is relevant. But in Romanian, where gender is not a feature of Inflection, gender mismatch does not improve the comprehension of object relatives (Sevcenco and Avram 2012). A feature is relevant in a certain language when it is syntactically 'active' and it belongs to the feature set triggering movement. This explains why case mismatch (case does not trigger movement in A-bar dependencies) does not facilitate the comprehension of object relative clauses in Romanian (Benţea 2015, Sevcenco and Avram 2012) or of *which* object questions in Hebrew (Friedmann, Rizzi and Belletti 2016). Similarly, case match does not seem to affect intervention.

Animacy does not trigger movement either. But the difference between subject and object relative clauses disappears when the object is inanimate, and the subject is animate. This is the most frequently encountered type in naturalistic corpora. However, Belletti and Chesi (2011) show that this animacy mismatch does not correlate with Italian adults' performance in experimental data. Similarly, Adani (2012) showed that animacy mismatch does not improve comprehension of object relative clauses by 4- and 5-year-old German-speaking children. Other studies, on the other hand, provide evidence that animacy mismatch facilitates theta-role assignment to the inanimate object and the embedded animate subject. This is the case of Benţea et al. (2014), on the basis of the comprehension of *wh*-questions and relative clauses in French.

Child Relativized Minimality has played an important part in recent studies on the acquisition of relative clauses and of *wh*-questions across languages. A significant number of studies provide convincing evidence in favour of this hypothesis.

Against Child Relativized Minimality

Goodluck (2009) is a response to Friedmann, Belletti and Rizzi (2009) who, as shown above, explain the delayed acquisition of object relatives and of object *wh*-questions in terms of Child Relativized Minimality (presented above). She provides several arguments against Child Relativized Minimality.

The first challenge comes from available acquisition data, which, she argues, cannot be accounted for under the Child Relativized Minimality Hypothesis. Remember that this hypothesis predicts that D-linked subject *wh*-questions are easy; only D-linked object *wh*-questions are difficult. Goodluck discusses acquisition data which reveal the opposite: children find D-linked object *wh*-questions easy and D-linked subject *wh*-questions difficult. Evidence in favour of the former comes from experimental data testing the comprehension of D-linked *wh*-questions by four to six-year-old English-speaking children. When the D-linked phrases contained the less specific 'which animal', children's performance on D-linked object questions was the same as for other types of questions tested (non-D-linked subject and object *wh*-questions and D-linked subject questions). Child Relativized Minimality predicts that children should perform worse on D-linked object *wh*-questions, but the prediction was not borne out by the data.

Evidence that D-linked subject *wh*-questions can also be difficult comes from a different comprehension study. The responses of 47 English speaking children with ages between 4 and 5 years show that D-linked object questions were significantly more difficult than non-D-linked object questions (in accordance with the prediction made by Child Relativized Minimality). But they also show a slight deficit with D-linked subject questions. The overall results of the study actually reveal an overall effect of D-linking. Goodluck (2009) correctly argues that the effect of D-linking on subject extraction is not accounted for by Child Relativized Minimality as formulated by Friedmann, Belletti and Rizzi (2009).

Previous studies also provide evidence against Child Relativized Minimality from the acquisition of object relatives. For example, in a repetition task, German–speaking children (age range 3-4) produced object relatives better when the head of the relative was animate (Kidd, Brandt, Lieven and Tomasello 2007, in Goodluck 2009). This result cannot be explained by Child Relativized Minimality.

Goodluck (2009) also claims that the way in which Child Relativized Minimality links children's grammar to adult representations/constraints is in contradiction with the continuity hypothesis (see the discussion and the references in Avram 2002): child grammar is a possible human grammar. According to Child Relativized Minimality, children's grammar can only cope with disjointness of features of the *wh*-phrase which has moved and the intervener. Goodluck (2009: 5) argues that "this implies that they are entertaining a grammar in which the distinction between A and A-bar positions is lost".

In accordance with the continuity hypothesis, Goodluck (2009) argues that the child's grammar has an adult-like Relativized Minimality. The delay in the acquisition of various *wh*-questions and relative clauses can be accounted for in terms of performance deficits. The combined effect of distance (between first Merge position and landing site of the *wh*-phrase) and specificity/D-linking increases the difficulty of D-linked object questions, for example. But the effect of D-linking also increases the difficulty of D-linked subject questions.

1.1.2.3 The AGREE Interference approach

It was shown above that Child Relativized Minimality predicts no subject-object asymmetry with *who* questions and a subject-object asymmetry with *which* NP questions. It also predicts that *which* NP object questions

should be more vulnerable than *who* object questions. This prediction, however, is challenged by the data reported for Italian in Guasti, Branchini, and Arosio (2012). The 35 Italian-speaking children (age range 3;11–5;11) in their study produced more subject than object *who* questions and more *which* questions than *who* questions overall (as also reported in Goodluck 2009). There was no difference between subject and object *which* questions, or between *which* object and *who* object questions.

To account for these findings, the authors propose an analysis of the data rooted in the theoretical analyses of subject-verb agreement in Guasti and Rizzi (2002) and Franck, Lassi, Frauenfelder, and Rizzi (2006). In Italian, agreement can disambiguate between a subject and an object *wh*-question. The core proposal of Franck, Lassi, Frauenfelder, and Rizzi's (2006) analysis is that subject-verb agreement takes place in two steps: (i) AGREE and (ii) Spec-head agreement, i.e., agreement is split in two sub-processes for SV sentences. AGREE ensures that the subject, which is first merged in the specifier position of the lexical verb, normally in Spec vP, copies the person and the number features into AgrS. This is the case of VS configurations. But when the subject moves out of the VP to Spec AgrS, it enters a Spec-Head relation with the AgrS head, which hosts the moved verb. This Spec head agreement ensures that the moved subject and the verb in AgrS have the same *phi*-features. Spec-Head agreement takes place only when the subject moves to pre-verbal position. In this case, agreement takes place in two steps: (i) AGREE, at the stage when the subject merges inside the verb phrase, and (ii) Spec-head agreement, after the subject has moved to Spec AgrS. In VS configurations, agreement takes place in one single step: AGREE.

In object questions, the *wh*-object moves out of the VP, to the left periphery. This movement goes through AgrOP, a functional projection lower than AgrS and higher than vP. It then moves higher, to the C-domain.

When AgrS, the Probe, looks for a Goal in the c-commanding domain, the object in Spec AgrOP is closer than the subject in Spec vP. This gives rise to interference effects; the object interferes in the AGREE relation between the thematic subject in Spec vP and AgrS. Object questions look like subject questions.

If the subject appears pre-verbally, in Spec AgrSP, the second step in subject verb agreement took place; the Spec-head agreement configuration ensures that the subject and the verb 'agree' in *phi*-features. Guasti,

Branchini and Arosio (2012) argue that the two-step morphological agreement process in the case of SV sentences makes the agreement relation stronger and helps avoiding the attraction errors which originated in the first step, AGREE. The second step corrects the interference effect from the previous AGREE relation.

This approach predicts a subject-object asymmetry with *who* questions. When children and adults attempt to create an object question, the copy of the *wh*-object interferes in the AGREE relation between the subject in Spec vP and the AgrS projection. The features of the *wh*-object are transferred to AgrS, generating an attraction error. In this case, agreement is obtained between the verb and the (copy of the) object, which is co-indexed with the fronted *wh*-phrase. This explains why children often produced subject questions instead of object questions in the elicited production task discussed in Guasti, Branchini and Arosio (2012). Adults also produced incorrect object questions due to the interference of the object copy with the AGREE relation. They also avoided producing object *wh*-questions. One avoidance strategy which they resorted to was to turn an object question into a subject question through passivization, which can be analyzed as an attempt at eliminating interference in the AGREE relation:

(12) "Chi `e rincorso dai cavalli?
Who is chased by the horses?"
(Guasti, Branchini, and Arosio 2012: 207)

But in the case of subject *who* questions, no interference effects apply. In the case of object *wh*-questions, Spec AgrSP is acceptable only for phonologically null subjects and not for lexical subjects as presented below:

(13) "*Chi i cavalli mordono?
Who the horses bite?"
(Guasti, Branchini, and Arosio 2012: 2006)

Children used null subjects or NP-topicalization mainly for object questions even if they are also acceptable for subject *wh*-questions. This supports the authors' claim that these are the result of an avoidance strategy.

Summing up so far, according to the AGREE Interference approach, object *wh*-questions are difficult to produce because a copy of the moved object interferes in the AGREE relation between AgrS and the subject

inside the vP. The second step in agreement, Spec-head agreement, which obtains when the subject has moved to Spec AgrS, can repair the interference effects which appeared at the AGREE step. Subject *wh*-questions are not vulnerable because there is no interference in the AGREE relation in their case. Unlike Child Relativized Minimality, the AGREE Interference approach predicts subject-object asymmetry with *who* questions.

Another important element within this approach is animacy. In an earlier study, Guasti (1996), the findings showed that 4 and 5-year-old children have no problems in forming subject and object *who* and *what* questions. But in that study, the verbs used in the task were nonreversible and the subjects and objects were not controlled with respect to animacy. In this context, the object copy does not generate errors in the production of target object *wh*-questions which indicates that the object does not interfere in the AGREE relation. Guasti, Branchini, and Arosio (2012) conclude that interference takes place only when the intervener and the Goal are both animate. Their claim is that children easily produce object *wh*-questions introduced by *what,* which is lexically inanimate and distinct from the Goal in the AGREE relation.

Though they do not state in an explicit way how their AGREE Interference approach can account for the lack of subject-object asymmetry with *which* NP questions in their data, the authors also link this to agreement. Children made errors both with subject and object *which* questions, more frequently than they did with *who* questions. This shows that there is a *which* - *who* asymmetry. The vulnerability of *which* questions is explained in terms of o coalition of factors: the structural complexity of *which NP* questions and the fact that *which* questions require both pied piping of the NP component – operation that children sometimes fail to do, leaving the NP *in situ* or replacing the *which* NP with *who*, and several agreement operations.

The interference hypothesis put forth in Guasti, Branchini, and Arosio (2012) makes several cross-linguistic predictions. The first one is that in languages like Italian, where the subject in object *wh*-questions is in post-verbal position, there should be marked subject/ object asymmetry during the early stages. Their second prediction is that in languages in which agreement is checked twice for independent reasons, there should be a different pattern of the subject/ object asymmetry in comparison with languages where there is only AGREE.