

Getting in Focus: the role of the NSR in children's interpretation of sentences with focused preverbal material

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1. Introduction

This paper discusses the comprehension of sentences with the focus operator *só* “only” by European Portuguese (EP) children between 2;9 and 4;11. Two main facts about *só* will be crucial for the discussion in this paper: the fact that *só* associates with focus and the fact that it introduces a presupposition.

Só associates with focus to the extent that the scope of *só* and the focus of a sentence generally coincide. On the other hand, since Horn (1969) it is assumed that *only* / *só* introduces a presupposition. In this paper, I suggest that the interpretation of *só* presents two independent problems for children: one problem is the definition of the scope of *só*; the other problem is the recognition of the presupposition.

2. Focus, acquisition and the Nuclear Stress Rule

In this section, I present Cinque's (1993) formulation of the Nuclear Stress Rule (NSR) and I make explicit its predictions for acquisition. I review the main findings concerning children's sensitivity to focus and show that the majority of these findings are in agreement with the predictions of Cinque's NSR.

2.1. Focus and Cinque's Nuclear Stress Rule

Cinque (1993) develops a theory of phrase and sentence stress assignment according to which there is no language specific NSR. Cinque claims that nuclear stress is assigned in all languages to the most embedded constituent, the relevant notion of embedding being determined by the direction of recursion. I.e. the constituent bearing the most prominent stress in a sentence is the most embedded one on the recursive side of a tree. This means that, when there are sister nodes, the most embedded one is the one that is selected by the other. Cinque's achievement is the fact that, according to this definition of the Nuclear Stress Rule (NSR), nuclear stress is always assigned to the embedded object in VO as well as in OV languages, and hence there is no need for a language-specific NSR.

Reinhart (1995), and also Neeleman and Reinhart (1998), propose that each sentence is associated with a set of possible focus readings, as in (1). When, by the application of the NSR, stress falls on the object, the focus set is defined as in (1'b). The discourse context will determine which member of the focus set is appropriate.

- (1) The focus set of IP consists of the constituents containing the main stress of IP.
 (1') a. [_{IP} Subject [_{VP} V *Object*]]
 a'. [_{IP} Subject [_{VP} *Object* V]]
 b. *focus set*: {IP, VP, Object}

The way Cinque (1993) defines the NSR makes it possible to claim that the NSR is innate (cf. Reinhart, *to appear*). If the NSR is not language specific, it is *a priori* plausible that is unlearned. Maturational factors aside, this leads to the prediction that children should manifest this knowledge from a very early stage.

In addition to the NSR, which assigns neutral stress and which is the default strategy of stress and focus assignment, languages use different strategies to depart from the NSR and to assign a focus interpretation to other constituents. The stress shift strategy is one of these strategies. When a constituent is focused that does not belong to the focus set derived by the NSR, there is a “stress shifting” strategy which may apply and give rise to a different focus reading. This is the case in (2), where the subject is focused. This focus reading is obtained through marked stress and, in this case, only the subject focus reading is possible (cf. Neeleman and Reinhart, 1998).

- (2) Q: Who went to the US yesterday?
 A: PETER went to the US yesterday.

Languages have also syntactic strategies of focus shifting. For instance, in (3) the subject, which does not necessarily receive contrastive stress, is interpreted as focused because it is associated with focus adverb *only* / *só*.

- (3) Só o Pedro foi ontem para os EUA.
 only the Pedro went yesterday to the USA
 ‘Only Pedro went to the US yesterday.’

In (4), the subject is interpreted as focused because it is clefted.

- (4) Foi o Pedro que viajou ontem para os EUA.
 was the Pedro that traveled yesterday to the USA
 ‘It was Peter who traveled to the US yesterday.’

It is plausible that, although the NSR is unlearned, the specific strategies that allow to establish readings not determined by the NSR are acquired on a case by case basis through the observation of the input. It is also possible that strategies of “focus shift” are computationally more complex than the NSR: Reinhart (*to appear* a, b) claims that stress shift (one strategy of focus shift) is computationally complex, whereas the NSR is computationally simple. We will return to this later in this paper.

2.2. Previous results concerning children’s sensitiveness to focus

Children’s recognition of focus positions in their language has indeed been at the center of current debate. Much of this debate concerns children’s interpretation of sentences containing the focalization adverb / quantifier *only*. Using different types of tasks, various researchers have tried to evaluate children’s knowledge of the scopal properties of *only*. The predominant result in these studies is compatible with the claim that children are sensitive to the NSR from the earliest stages of language acquisition.

Gualmini, Maciukaite and Crain (1992) show that English speaking children do not have an adult interpretation of sentences with *only* and stress shift within the VP: differently from adults, children seem to ignore the effects of stress shift and associate *only* to the most embedded constituent in the VP. Szendrői (2003) shows similar facts. She shows that 9 out of 23 Dutch speaking children (4;1-6;10) fail to interpret sentences with stress-shift within the VP: instead of interpreting *alleen* “only” as associating with the constituent with the main stress, they interpret *alleen* as associated with the VP. Costa and Szendrői (2004) replicate the same finding with EP children (3;11-5;9). The important fact is that the VP focus reading in Szendrői’s and in Costa and Szendrői’s studies can be obtained without stress-shift. According to Neeleman and Reinhart’s definition of the focus set (cf. 1), VP focus is one of the possible readings if stress is on the most embedded XP, i.e. the position determined by the NSR. So it may be that in these cases as well children are merely interpreting sentences according to the NSR. Philip (1999) presents compatible evidence. He shows that Norwegian children (4;5 to 6;9, mean age 6;0) apply an object focus reading to VSO sentences in which the subject is under the scope of *bare*, but they do not do the inverse.

Other studies tested children’s ability to interpret sentences in which *only* associates with a preverbal subject. Crain et al. (1992) tested 3 to 6-year-old children (mean age: 4;9) on their comprehension of sentences in which *only* associates with a preverbal subject and sentences in which *only* is in preverbal position and associates with the postverbal object. They notice that some children overuse a focus subject reading and others overuse an object focus reading.

Paterson et al. (2003) carried out a large scale study on English-speaking children's and adults' comprehension of sentences with *only* in a picture-choice task. They compared the performance of 4- to 12-year-olds and adults on sentences with *only* preceding a preverbal subject and sentences with *only* preceding a VP – cf. (5a, b). Their results indicated that the majority of errors corresponded to cases in which the children interpreted sentences with *only* as if *only* were not present in the structure. For example, they interpret (5a) or (5b) as (6). There was also a group of responses indicating that children misanalyze the scope of *only*: in these cases, children interpret (5a) as (5b) or the opposite (as in Crain et al.'s 1992 results).

- (5) a. The fireman is only holding a hose.
b. Only the fireman is holding a hose.
- (6) The fireman is holding a hose.

More recently, Endo (2004) presents results on children's interpretation of the focus particles *dake* 'only' and *sika-nai* 'nobody except / nothing but' in SOV sentences in Japanese. Endo shows that, although the majority of children have an adult interpretation of the sentences in which the focus particles are attached to the object, they do not have an adult interpretation of the sentences in which the focus particles are attached to the subject. The typical non-adult reading of a sentence in which the focus particle was attached to the subject was a reading in which the children interpreted the focus particle as if it was attached to the object

Although the results across these different studies are not identical and although they have received different interpretations, the predominant response is the one indicating that children interpret *only* as associated with the unmarked position of stress, i.e. the most embedded position. In this paper I develop the hypothesis that this predominant response reflects the fact that children initially interpret focus according to the NSR. They then later acquire language specific strategies of focus shift. The hypothesis developed here is stated in (7):

(7) Default Focus Hypothesis (DFH)

Children start with a default focus assignment strategy, which corresponds to the application of a universal NSR.

3. The experimental setting

We tested a group of 20 monolingual EP speakers aged 2;9 up to 4;11 (mean age 3;8) and a group of 16 adult controls with no background in linguistics on their interpretation of sentences with *sō*. The experimental subjects were presented with simple situations acted out with props in which experimenters offered different types of food to two animals and the animals accepted or refused it. The test was a

Truth Value Judgment Task (Crain and Thornton, 1998), in which children were presented with yes-no questions. The following three types of structures were tested: *só* in pre-VP position, *só* associated with a preverbal subject, and *só* associated with a preverbal subject that was focused by an inverted “é que” pseudo-cleft – Condition 1, Condition 2 and Condition 3, respectively. In each condition, children were presented two test questions (along with filler questions); one of the test questions expected an affirmative answer and the other expected a negative answer. The situation and the test questions in Condition 1 is presented in (8).

(8) Condition 1:

The pig is eating a cookie and a banana; the cow is eating a cookie and has refused the banana.

a. First question

Lead-in: O porco só quer a banana?
the pig only wants the banana
‘Does the pig only want the banana?’

Target answer: NO

b. Second question

Lead-in: A vaca só quer a bolacha?
the cow only wants the cookie
‘Does the cow only want the cookie?’

Target answer: YES

By comparing the answers in the two test questions, we arrive at more secure conclusions about the readings that children attribute to the different questions. We identify four different readings: not only object focus and subject focus, but also sentence focus and a reading in which *só* “only” is ignored. Namely, if the child answers “no” to both questions, the child may be allowing *só* to associate with the whole sentence, a case of “sentence focus reading”. A sentence focus reading in Condition 1 corresponds to the reading: “the only thing that happens / happened is / was that the pig wants the banana”. Finally, an affirmative answer to both questions would indicate an interpretation in which *só* is ignored (*yes* bias excluded on the basis of filler and warming-up questions). In this case, the first question in Condition 1 would be interpreted as “Does the pig want the banana?”.

Table 1 synthesizes the four possible answer patterns in Condition 1.

Table 1 - Answers to questions in Condition 1 and their interpretation

Question 1	Question 2	Reading
Negative	Affirmative	→ Object focus reading
Affirmative	Negative	Subject focus reading
Negative	Negative	Sentence focus reading
Affirmative	Affirmative	<i>Só</i> is ignored

In (9) and (10), I present the settings and the questions in conditions 2 and 3.

(9) Condition 2

The pig is eating an apple and has refused the orange; the cow is eating an apple and an orange.

a. First question

Lead-in: Só o porco quer a maçã?
 Only the pig wants the apple
 'Does only the pig want the apple?'

Target answer: NO

b. Second question

Lead-in: Só a vaca quer a laranja?
 Only the cow wants the orange
 'Does only the cow want the orange?'

Target answer: YES

Table 2 - Answers to questions in Condition 2 and their interpretation

Question 1	Question 2	Reading
Affirmative	Negative	Object focus reading
Negative	Affirmative	→ Subject focus reading
Negative	Negative	Sentence focus reading
Affirmative	Affirmative	Só is ignored

(10) Condition 3

The pig is eating lettuce and a carrot; the cow is eating lettuce and has refused the carrot.

a. First question

Lead-in: Só o porco é que quer a cenoura?
 Only the pig is that wants the carrot
 'Is it only the pig that wants the carrot?'

Target answer: YES

b. Second question

Lead-in: Só a vaca é que quer a alface?
 only the cow is that wants the lettuce
 'Is it only the cow who wants the lettuce?'

Target answer: NO

Table 3 - Answers to questions in Condition 3 and their interpretation

Question 1	Question 2	Reading
Negative	Affirmative	Object focus reading
Affirmative	Negative	→ Subject focus reading
Negative	Negative	Sentence focus reading
Affirmative	Affirmative	Só is ignored

In order to avoid possible effects of order of presentation, the children were presented with the 3 conditions in different orders. For 9 children the order of presentation was Conditions 1, 2, 3; for 11 children the order was Conditions 2, 1, 3. No effects of order of presentation were found.

4. Results: two major response patterns

In this section, I present the results, starting with the adult controls. Figure 1 presents the results of the adult controls.

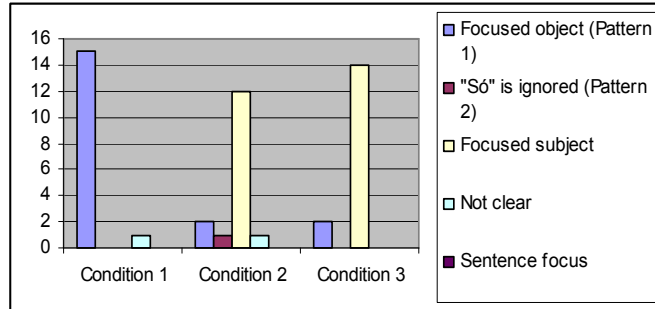


Fig. 1 – Results of EP adult controls' interpretation of focus

Most adult controls (12 out of 16) performed as expected. When adults did not perform as expected, they tended to interpret the test questions in Condition 2 and 3 (the subject focus conditions) according to an object focus reading. Although only 3 adults consistently gave this reading, 3 other adults first interpreted sentences in Condition 2 according to an object focus reading and then reformulated their interpretation according to the adult subject focus interpretation. We will come back to these adult errors in section 5.

In Figure 2, I present children's results.

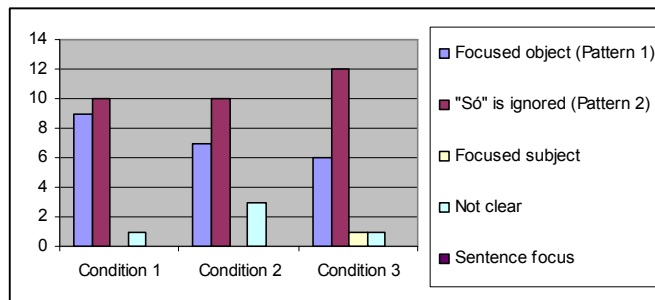


Fig. 2 – Results of EP children's interpretation of focus (age 2;9-4;11)

The child results can be summarized as follows:

(i) Children do not assign a subject focus reading either in cases in which this is the target reading (Conditions 2 and 3) or in cases in which this reading is not expected (Condition 1). The only exception is one child (one of the oldest) who performed adult-like in interpreting *só* as focusing the subject in Condition 3.

(ii) Independent of the exact structure that was tested, children's answers fell into one of two patterns: either they interpret *só* in all sentences as associating with the post-verbal object DP (we refer to this as *Pattern 1*) or they answered 'yes' to all test questions, although they answer 'no' when relevant in filler trials (we refer to this as *Pattern 2*).

Most children were fairly consistent in their responses, conforming to either the object focus reading (Pattern 1) or Pattern 2 across test conditions. The distribution of children across response types is given in Figure 3.

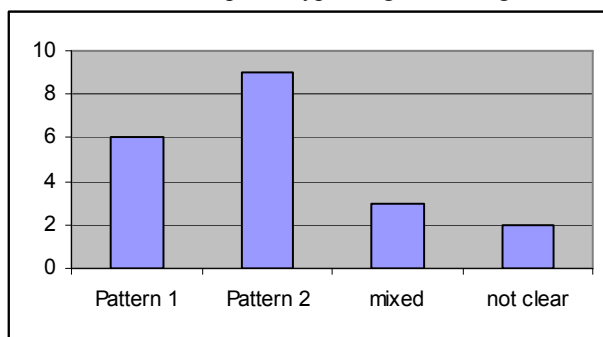


Fig. 3 – Distribution of children across response types

5. Discussion

5.1. The default focus reading (Pattern 1)

Pattern 1 corresponds to a reading in which *só* associates with the post-verbal object DP. Six children use this pattern across the different conditions, i.e. also in Conditions 2 and 3, in which this is not an expected reading. The following is a typical justification associated with this type of reading:

(11) Condition 3

Lead-in: Só o porco é que quer a cenoura?
only the pig is that wants the carrot
'Is it only the pig that wants the carrot?'
(Target answer: yes)

Child: Não. Quer # folha de alface e cenoura.
no wants lettuce and carrot
‘No, he wants lettuce and carrot.’

The responses of Pattern 1 children are in agreement with the DFH (cf. 7). Children interpret *só* as associated with the embedded object even in cases in which *só* associates with the subject in the target grammar (cf. Condition 2 and 3). The results are consistent with the claim that children start with the NSR as a default strategy of focus interpretation.

Reinhart (*to appear* a, b) proposes a parsing explanation for children’s difficulty with focus in stress shift contexts. However, the particular results we are discussing here cannot be accounted for by a processing explanation. A strict processing account of the results obtained is possible if we show that children have the relevant competence; the results obtained in this experiment suggest that children do not have the knowledge necessary to interpret preverbal material as focused, but rather interpret focus strictly according to the DFH. But our results are also not evidence against Reinhart’s hypothesis: it is possible that, after having acquired strategies of shifting focus from its default position, children show processing difficulties of the type suggested by Reinhart. It is possible that this bigger processing load associated with non-default focus readings explains the few errors in the adult control group, which also reveal a preference for the object focus reading.

Finally, let us return briefly to the fact that Crain et al. (1992) and Patterson et al. (2003) obtained subject focus readings in object focus contexts. This could be a problem for the DFH that we propose in this paper. However, the children in Crain et al.’s and Patterson et al.’s studies are older than in the experiment reported in this paper (mean age in Crain et al.’s study is 4;8 and 5;0; the youngest children in Patterson et al.’s study are 4- to 5-year-old children). So it is possible that some of the children in these studies had already acquired the non-default focus positions and, at some point, overuse a subject focus reading.

5.2. Pattern 2

Pattern 2 corresponds to cases in which children answered affirmatively to all test questions, although they answered *no* appropriately in filler questions. Therefore, I maintain that these are not cases of a “yes” bias. Instead, I argue that in these cases children interpret sentences as the corresponding sentence without *só*. Patterson et al. (2003) first noticed this type of answer and claim that this is a strategy English-speaking children use to interpret sentences with *only*. The hypothesis that Pattern 2 children interpret sentences as the corresponding sentence without *só* is supported by some of the justifications provided by children:

In answer to the first test question in Condition 2:

(12)Lead-in: Só o porco quer a maçã?
only the pig wants the apple

‘Does only the pig want the apple?’

(Adult answer: Não.)

Child: Sim. Quer uma maçã.

Yes wants a apple

‘Yes. He wants an apple.’

As an explanation for Pattern 2, we hypothesize that children (at least up to 4;11, according to our data) may have a problem dealing with *só* that is independent from the identification of focus: children do not understand that a sentence with *só* introduces a presupposition. We call this the Presupposition Difficulty Hypothesis (PDH). Sentences with *only* introduce presuppositions. For instance, the sentence in (12) introduces the presupposition “the pig wants the apple”, i.e. (12) can only be uttered in a context in which it is assumed to be true that the pig wants the apple. So what is under discussion in (12) is whether no other animal but the pig want the apple, not whether the pig wants the apple. If children do not recognize the presupposition, in the sense that they take the presupposition as an assertion, they will interpret the question in (12) as asking also the sub-question “does the pig want the apple?”. This sub-question is always compatible with a “yes” answer because the situations in which a question such as (12) can be felicitously asked are situations in which it is true that the pig wants the banana. Thus, when children systematically answer affirmatively to the test questions in our experiment, our hypothesis is that they are taking the presupposition as an assertion.

5.3. The co-existence of “default focus” and “presupposition difficulty”

In the previous section, I argued that children in the age range of the subjects in our experiment have a problem identifying as such the presupposition introduced by *só*. On the other hand, I also argued that children in the same age range have difficulty accessing focus interpretations that are not derived by the NSR. Therefore, these children cannot interpret as focused a preverbal subject.

Note now that the fact that the presupposition problem and the default focus problem are independent interpretation problems makes it possible that the two problems co-exist in the same child. In fact, Pattern 1 and Pattern 2 groups are not related to different age groups and therefore it is implausible that Pattern 1 and Pattern 2 correspond to different developmental stages. I would like to suggest that all the children in this study may have both interpretation problems, irrespective of

whether they perform according to Pattern 1 or to Pattern 2. To clarify the hypothesis, I outline children's interpretation of one of the test questions. My hypothesis is that all the children in our study take as an assertion the presupposition introduced by *só*, and hence interpret (13) as asking the two sub-questions in (13a and b).

- (13) *Só o porco quer a maçã?*
Only the pig wants the apple
'Does only the pig want the apple?'
- a. Does the pig want the apple?
 - b. Does the pig only want the apple?

In addition, the children are unable to interpret the preverbal subject as focused, and hence may formulate the sub-question in (13b) as a question in which *só* associates with the VP or the embedded object. Thus, if children choose to answer (13a) they manifest the presupposition difficulty, if they choose to answer (13b) they manifest the default focus strategy. The fact that there exists a group of three mixed children (cf. Fig. 3), i.e. children that interpret some questions according to default focus strategy and some others according to the Pattern 2 strategy is in agreement with the idea that the two problems may co-exist in the same child.

6. Conclusion

In this paper, I argue that children do not have adult knowledge of the interpretation of *só* "only". First, they start with a more limited set of possibilities as far as the definition of the scope of *só* is concerned: children start by restricting the scope of *só* to the constituents that are identified as focus according to the NSR. Second, I argue that children do not know that *só* introduces a presupposition (in the sense of Horn, 1969) and they can take as an assertion the presupposition introduced by *só*.

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