# Early VP ellipsis: production and comprehension evidence

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## 1.   Acquisition of ellipsis and the syntax - discourse interface[1]

Ellipsis is a type of anaphora common in spontaneous speech. As Barss (2003: ix) puts it: "the term *anaphora* is used to cover a myriad disparate cases of a linguistic expression receiving part, or all, of its semantic interpretation via a dependency upon an antecedent, rather from its internal lexical content". This means that production and comprehension of ellipsis imply the ability to recover the reference of the elided material from a discourse antecedent.

The fact that ellipsis may be defined as a product of the syntax - discourse interface makes it an interesting topic for research in language acquisition. Several studies have suggested that, although children converge on adult syntax very early on ("Early Morphosyntactic Convergence", Wexler 1998), the development of the syntax-discourse or syntax–pragmatics interface happens later (Schaeffer 1997; Hoekstra and Hyams 1998; Avrutin 1999). For instance, Schaeffer (1997), who studied the acquisition of object scrambling in Dutch, suggests that two-year old children do not always take into account the discourse context and the knowledge of the interlocutor to the extent that it is needed to mark specificity. Given these hypotheses, we may think that possibly the child is not able to deal with some aspects of the syntax – discourse interface or, alternatively, that he cannot deal in general with this interface.

If the more general hypothesis is true, it has important consequences for the way we conceive the syntax - information structure interface in the first stages of language acquisition since the ability to deal with concepts such as *new* or *given* implies that we consider the discourse context. Therefore, if production and

comprehension of ellipsis implies the ability to establish an antecedent in preceding discourse, we might hypothesize that children cannot produce and comprehend VP ellipsis in the earliest language acquisition stages because they are not able to identify the elided material. On the contrary, if children can produce and comprehend VP ellipsis in appropriate contexts, this must mean that they are able to use the discourse context in order to determine the content of the elided material. This is the hypothesis pursued in the present study.

This paper aims at showing that the acquisition of VP ellipsis provides evidence in favor of early ability to deal with the syntax - discourse interface, to the extent that it is needed to determine the interpretation of elided material. In section 2, I define the type of syntactic and discourse knowledge implied in the production and comprehension of VP ellipsis. In section 3, I summarize previous research on the acquisition of VP ellipsis and show that the majority of this research agrees that 3 year-old children can produce and comprehend VP ellipsis. I also report the result of Grodzinky's (2005) study, which challenges this view and suggests that children (4 and 5 year-olds) do not always have an adult interpretation of VP ellipsis contexts. In section 4, I report the results of a comprehension experiment that uses Grodzinsky's (2005) methodology and show that children (4 to 6 year-olds) acquiring European Portuguese are able to understand VP ellipsis to the extent that they recover the interpretation of the elided material from a linguistic antecedent, in the same way as adults. These results are in agreement with previous findings showing that European Portuguese children spontaneously produce VP ellipsis in adequate contexts in very early stages of language acquisition (MLUw at or below 2.0).

## 2. VP ellipsis at the syntax - discourse interface

Let us define the syntax-information structure interface as it is implied in production and comprehension of ellipsis.

Work on VP ellipsis generally assumes that both a licensing condition and an identification condition operate in VP ellipsis. VP ellipsis is licensed in a specific configuration, in particular, in a configuration in which a verb c-commands the deleted VP. This

explains why in English only auxiliaries or the copula, which are the verbs that occur in I, license VP ellipsis. In European Portuguese, all verbs raise to I and all verbs license VP ellipsis; however, in French or Spanish there is V-to-I raising but no class of verbs licenses VP ellipsis. The licensing condition on VP ellipsis may therefore be defined in terms of a parameter that specifies the class of *nuclei* (i.e. the subclasses of verbs) that, in each language, licenses VP ellipsis; in some languages, such as French or Spanish, no class of *nuclei* qualifies as a VP ellipsis licensor (this is the approach taken in Matos 1992). Alternatively, the licensing condition on VP ellipsis may be conceived as a feature instantiated in a functional category dominating the VP (Merchant 2001).[2]

In acquisition terms, in order to acquire VP ellipsis, children must set a set of different parameters. They must acquire V-to-I raising, since it is generally true that there is VP ellipsis only when there is a verb in a functional projection dominating the VP; they must also set a parameter determining if the language has VP ellipsis / a parameter determining the class of *nuclei* that licenses VP ellipsis in the language or, alternatively, they must acquire a feature. This is the syntax work involved in the acquisition of VP ellipsis.

But we will be especially concerned here with the identification condition operating in VP ellipsis. Classically, the identification condition on VP ellipsis has been defined as a requirement of strict morpho-syntactic parallelism, i.e. a condition of structural isomorphism (see Hankamer and Sag 1976; for Portuguese, see Matos 1992 or Cyrino and Matos 2005). If seen as a requisite of morpho-syntactic parallelism, this condition could be defined in purely syntactic / morpho-syntactic terms. However, several authors have shown that such a condition fails to account for all the data (see Hardt, 1993 a.o.).

More recently, Merchant (2001) explores a hypothesis developed by Tancredi (1992): contexts of deletion (ellipsis) are a subset of deaccenting contexts. This captures the idea that elided material must be *given* (as deaccented material) but that it must obey another restriction. Therefore, Merchant (2001) suggests e-givenness (in 1) as a condition on ellipsis. In very general terms, the restriction in (1i) requires that elided material be given, to the extent that the antecedent must entail the elided material – this is the part of the

restriction on ellipsis that is common to deaccenting contexts; the restriction in (1ii) implies, in simplified terms, that the elided expression entails the antecedent. This second restriction is thought to derive contrasts such as the contrast in (2) and (3): the elided material in (2) must be interpreted according to this second restriction (it must be e-given) but the deaccented material in (3) – signaled by the small characters – must only be given, not necessarily e-given, and thus must only obey the first restriction.

(1) "e-GIVENness
An expression E counts as e-GIVEN iff E has a salient antecedent A and, modulo ∃-type shifting,
    (i) A entails F-clo(E), and
    (ii) E entails F-clo(A)"           (Merchant 2001: 26)

(2) Abby called Chuck an idiot after BEN did [-].
a [-] = call Chuck an idiot
b [-] ≠ insult Chuck               (Merchant 2001: 27)

(3) Abby called Chuck an idiot after BEN insulted him.

      In this work, we will not be concerned with the technical details of this analysis. However, these theoretical advances, and in particular Merchant's approach to ellipsis, have important consequences for the way we conceive work on the acquisition of ellipsis. By defining a condition on ellipsis as a condition that contains a "givenness" restriction common to deaccenting contexts, Merchant relocates ellipsis in the centre of the debate concerning the syntax / information structure / prosody interface. The concept of given is an information structure concept that has proved to have clear consequences for the syntax – prosody interface. The idea of "anaphoric destressing" is not new in the linguistics literature (see Selkirk 1984). Ellipsis can now be seen as another product of this interface.[3]
      In order to produce and comprehend ellipsis, a child must determine if the deleted material is given (the condition in 1i) and he must also determine if it is e-given (in which case it obeys the restriction in 1ii). The ability to produce and comprehend ellipsis is

therefore clearly an ability to operate at the syntax – information structure interface.

## 3. Previous studies on the acquisition of VP ellipsis

Ellipsis is not one of the topics that received a privileged amount of attention in language acquisition research. There are, however, some studies on the acquisition of ellipsis, most of them experimental work centered on VP ellipsis in English.

3.1. Work on English

Postman, Foley, Santelmann and Lust (1997) is, to my knowledge, one of the first works presenting data of early production of VP ellipsis. The authors show that children between 2;7 and 3;11 are able to produce VP ellipsis in English when responding to an imitation task. Importantly, the same children sometimes produce VP ellipsis when the stimulus-sentence does not contain ellipsis (see 4):

(4) E:  Bert wipes his nose and Mickey wipes his nose too.
    S:  Bert wipes his nose and Mickey <u>does</u>  too. (JS 2;10)

Other studies present results concerning children's capacity to comprehend VP ellipsis. Foley, Prado, Barbier and Lust (1997, 2003) present results of act-out and truth value judgment tasks and show that children between 3;0 and 7;11 are able to understand VP ellipsis.[4] Thornton and Wexler (1999) confirm that children between 4;0 and 5;1 are able to recover the syntactic structure of the elided material. Their work focuses on the interpretation of pronouns in VP ellipsis contexts and shows that children are sensitive to a "structural parallelism" restriction on VP ellipsis, which is defined as following: "NPs in the elided and antecedent VP must both be bound variables or both be referential pronouns" (Thornton and Wexler, 1999: 117). Trying to explain why children are sensitive to this restriction, the authors suggest that it may be innate. Matsuo and Duffield (2001) present results of a grammaticality judgment task and confirm that children are sensitive to a morpho-syntactic parallelism restriction operating on ellipsis. If we take a morpho-syntactic parallelism restriction as a formulation of the identification condition on ellipsis

and if this identification condition implies identifying a linguistic antecedent for the elided material, these results are in agreement with the results presented by Wijnen and Roeper (2004, 2005), who suggest that ellipsis, in particular nominal ellipsis, is one of the first types of discourse integration that children can deal with.

However, not all researchers agree that children are capable of adult understanding of VP ellipsis. Grodzinsky (2005) suggests that possibly the success that children obtained in Thornton and Wexler's study is due to the particular experimental conditions. Grodzinsky observes that, when children are presented the sentence in (5) in Thornton and Wexler's study, in a situation in which the caveman kissed the dinosaur and Fozzie Bear kissed his own hand, in order to accept the sentence they would have to accept a transitive action in the antecedent and a reflexive action in the ellipsis site.

(5) [$_A$ The caveman kissed the dinosaur] and [$_E$ Fozzie Bear did, too].

Grozinsky (2005) develops a Truth Value Judgment Task in which children must assess the correspondence between sentences and situations (given by images) in which two transitive actions took place. The images always present three characters, all mentioned in the test sentence. As an example of a mismatch situation, children evaluate the sentence in (6) relative to an image where a girl kicks a tiger and the same girl kicks a boy.

(6) The girl kicked a tiger and the boy did too.

The results obtained suggest that children (4;9 – 5;9) sometimes accept this type of sentence in mismatch situations, a fact that challenges the idea that children have adult-like ability to understand VP ellipsis. However, the majority of the children gave adult answers and no age effect was found in results.

The results obtained by Grodzinsky are preliminary (two out of five children gave non-adult answers), but they clearly show that more (and more detailed) work is needed to determine pre-school children's ability to comprehend VP ellipsis.

3.2. A production study on European Portuguese

In Santos (2006, 2007), I evaluated the spontaneous production of three children between 1;5.9 and 3;11.12. The details of the corpus are presented in Table 1.

Table 1 – Santos (2006) corpus[5]

| Child | Age | MLUw | Number of files | Number of child's utterances |
|-------|-----|------|-----------------|------------------------------|
| Inês | 1;6.6 – 3;11.12 | 1.527 – 3.815 | 21 | 6591 |
| Tomás | 1;6.18 – 2;9.7 | 1.286 – 2.954 | 16 | 6800 |
| InêsM. | 1;5.9 – 2;7.24 | 1.315 – 2.370 | 15 | 5101 |

In this corpus, all contexts of affirmative answer to yes--no questions were analysed. European Portuguese displays different types of answers to yes-no questions (verbal answers, *sim* 'yes' answers and *ser* 'be' answers, as in 7 and 8):

(7)     Q:      Tens            lido o    jornal?
                have[2nd sg]     read the   newspaper
                'Have you been reading the newspaper?'
        A: a.   Tenho.   – Verbal answer (VP ellipsis)
                have
                'Yes.'
            b.  Sim.     - *sim* 'yes' answer
                yes
            c.  É.       - *ser* 'be' answer
                is
                'Yes.'

(8)     Q:  Deste   o    jornal ao professor na biblioteca?
                gave   the  newspaper to+the teacher at+the library
                'Did you give the newspaper to the teacher at the library?'
        A: a.   Dei.   – Verbal answer (VP ellipsis)

          gave[1$^{st}$ sg]
          'Yes.'

    b.   Sim.    - *sim* 'yes' answer
          yes

    c.   É.   / Foi.   - *ser* 'be' answer
          is     was
          'Yes.'

Verbal answers are generally analyzed as VP ellipsis (see Matos 1992 and, in particular, Martins 1994), which in European Portuguese may be licensed by an auxiliary, as in (7), or by a main verb, as in (8). Since Raposo (1986) and Matos (1992), it has been assumed that main verbs license VP ellipsis, what is explained by the fact that all verbs raise to I in EP and therefore may license a deleted VP in its c-command domain. Given the fact that main verbs license VP ellipsis, all verbal answers may be derived through VP ellipsis, even though a subset of those answers involving a main verb may be ambiguous between VP ellipsis and null object (when only a DP internal argument is omitted) or VP ellipsis and null complement anaphora (when a sentential internal argument is omitted). Santos (2006) argued that unambiguous VP ellipsis cases include VP ellipsis licensed by an auxiliary (as in 7), cases of copula verbs licensing VP ellipsis, cases in which more than an internal argument is omitted (as in 8) and cases in which a VP modifier is omitted.

The analysis of the spontaneous production corpus shows that children acquiring European Portuguese produce unambiguous cases of VP ellipsis in the context of answers to a yes-no question (see 9 to 11). In (9) and (10) VP ellipsis is licensed by an auxiliary, in (11) it is licensed by a copula verb.

(9)    INI:   (es)tá (a)     dai [: dar] e [: lhe] colo.
               is    PREP    give     him     lap
               'Inês is putting him in her lap.'
    MAE:  estás lhe       a      dar  colo?
               are   CL-DAT  PREP give lap
               'Are you putting him in your lap?'
    INI:   (es)tou.
               am
               'Yes.'                      Inês 2;1.10

(10)     MAE: o   cavalo vai   papar?
                the horse   goes eat
                'Is the horse going to eat?'
         TOM:  vai.
                goes
                'Yes.'                                    Tomás 1;9.14


(11)     MAE:  está      sujo ?
                is         dirty
                'Is it dirty?'
          INM: (es)tá .
                is
                'Yes.'                                    Inês M. 1;7.6


Moreover, it was determined that children frequently produce verbal answers (1060 verbal answers were found in the corpus) and that a relevant subset were unambiguous cases of VP ellipsis: 20.6% (218 out of 1060 cases) if all verbal answers are included; 43.7% (218 out of 499 cases) if we exclude cases of question-answer pairs involving the forms *é* 'is', *foi / era* 'was' of the verb 'to be', which may also occur as *ser* 'be' answers (see examples 7 and 8).

Unambiguous VP ellipsis cases are found in the spontaneous production at the earliest stages of multiword production: before 2 years and at a stage in which the MLUw is at 2.0 or below 2.0. These facts show early morpho-syntactic convergence between the adult and the child grammar, showing that the child fixed the parameter determining VP ellipsis in the language or acquired the feature related to VP ellipsis (the licensing condition on VP ellipsis). But these facts also leave open the possibility that children in these early stages are able to deal with the identification condition operating on VP ellipsis. If this condition is defined as e-givennness (see section 2), this means that children have an early ability to deal with the syntax – information structure interface. Santos (2006, 2007), based on the learnability problems posed by ambiguous input data, assumed that the e-givenness restriction may be derived from innate principles, namely, (i) following Merchant's (2001) suggestion, a universal restriction establishing that deaccented material must be Given and (ii) the Full Interpretation Principle (Chomsky 1986).

3.3. A prediction: comprehension of VP ellipsis

The hypothesis that the e-givenness restriction may be derived from innate principles is compatible with the spontaneous production data discussed in Santos (2006, 2007), as well as with the elicited production results presented by Postman, Foley, Santelmann and Lust (1997).

But this is a hypothesis that makes clear predictions about comprehension. The analysis assumed here for VP ellipsis, along the lines of Merchant (2001), includes an identification condition defined in terms of e-givenness and is an analysis that takes ellipsis as deletion. Therefore, an elided VP is a fully projected VP that gets deleted at PF. The possibility of deletion depends on the condition of e-givenness being verified, and this means that the possibility of deletion depends on the ability to recover the interpretation of the elided material from a linguistic antecedent. If we hypothesize that early (apparent) VP ellipsis is not adult VP ellipsis but a *pro* in complement position,[6] the interpretation of the omitted material would not be equally constrained: a *pro* could have its reference established in the situational context and not necessarily by a linguistic antecedent, as happens with null complement anaphora (see Hankamer and Sag 1976 and Depiante 2000, 2001 for the analysis of null complement anaphora as a *pro*).

Some of the results obtained until now on VP ellipsis comprehension suggest that children have the adult interpretation of VP ellipsis and would be in agreement with a hypothesis maintaining that the e-givenness restriction operating in VP ellipsis is derived from innate constraints or in place very early in the acquisition process. However, the results obtained by Grodzinsky are a challenge to this hypothesis, since they suggest that children do not completely understand VP ellipsis contexts. In the following section, I show the results of a comprehension test that focuses on VP ellipsis in European Portuguese and which is developed along the lines of Grodzinsky (2005).

## 4. Comprehension evidence

4.1. Methodology

The test that I report here consists of a Truth Value Judgment Task (TVJT) (Crain and Thornton 1998) and was applied to a group of 44 children between 4;5 and 6;7.[7]

Table 2- subjects: number and age

| 4 year-olds (mean: 4;8 ) | 5 year-olds (mean: 5;6) | 6 year-olds (mean: 6;4) |
|---|---|---|
| 8 | 25 | 11 |

The test was administered by two experimenters, one acting out the stories with small toys and props and the other manipulating a puppet who said the sentences that should be evaluated. A third experimenter recorded children's answers, which were also audio-taped. Each child was tested during two separate sessions of 30 minutes each. Filler trials were presented between the test items, which also allowed to detect any "yes" or "no" bias and, in the first session, a warm-up trial ensured that children understood the task. Before the test sessions, one of the experimenters went to the school to tell a story to children and to present them the puppet that would interact with them during the test sessions.

Test conditions were defined according to Grodzinsky's (2005) model, even though the methodology used was not exactly the same. First, Grodzinsky's task was a TVJT in which children evaluate the correspondence between sentences and images; the task reported here is a TVJT in which children evaluate the correspondence between stories acted out with props and sentences (see Crain & Thorton 1998 for an overview indicating advantages of experimental designs that include stories told in a dynamic fashion). Moreover, in Grodzinsky's

task, as far as I understand it, there was no plausible dissent / assent (see Crain et al. 1996 for the definition of this condition; the difficulty in satisfying the plausible dissent / assent condition is one of the problems pointed out by Crain & Thornton 1998 to experimental designs based on pictures). In the test reported here, the stories respect the condition of plausible dissent.

Secondly, as mentioned before, VP ellipsis in Portuguese may be licensed by main verbs as well as by auxiliaries. Therefore, both test items with main verbs and test items with auxiliaries were included, as it will be explained in detail.

Finally, since we also evaluate comprehension of sentences in which VP ellipsis is licensed by main verbs, it was necessary to restrict test items to sentences that are not ambiguous, i.e. sentences that could only be derived through VP ellipsis. As mentioned before, in Portuguese there is VP ellipsis but there are also other types of null anaphora, such as null objects. For instance, the omitted material in (12) may be derived as VP ellipsis but it could also be derived as a null object, since only a direct object is missing.

(12)    O   tigre magoou o  leão e    o   porco também magoou [-].
        the tiger hurt    the lion and the pig     also       hurt
        'The tiger hurt   the lion and the pig did too.'
        [-] =    o leão
                 the lion

In order to avoid this type of ambiguity, test sentences were sentences with ditransitive verbs, which cannot be interpreted as null object cases (see Santos 2006, in which it is argued that these cases can only be derived through VP ellipsis) – except in one of the conditions, in which only a test item with an auxiliary was included and in which there was therefore no ambiguity.

In (13), I present the six conditions that were considered. For ease of exposition, I exemplify the test with a unique sentence considered in the six situations corresponding to the six conditions. In some test conditions, there was a test item with ellipsis licensed by a main verb and a test item with ellipsis licensed by an auxiliary, as is explained in greater detail below.

(13)
a. Test sentences

|  | A | B | C |
|---|---|---|---|
| *O tigre deu comida ao leão e o porco* |  |  |  |
| the tiger | gave food to+the lion | and the | pig |

*também deu.*
also    gave
'The tiger gave food to the lion and the pig did too.'

*O tigre está   a      dar comida     ao     leão e o        porco*
the tiger is       PREP   give food             to+the lion and the       pig
*também está.*
also     is
'The tiger is giving food to the lion and the pig is too.'

b. Conditions

Condition 0     A => B C => B
The situation matches the adult interpretation of the sentence.

Condition 1     A => B B => C
    Sit: The tiger helped the lion by giving him food and then the lion helped the pig by giving him food.

Condition 2     A => B C => A
    Sit: The tiger helped the lion by giving him food and then the pig helped the tiger by giving him food.

Condition 3     A => B A => C
    Sit.: The tiger helped the lion by giving him food and then the tiger also helped the pig by giving him food.

Condition 4     A =>x => B     C => y => B
    Sit.: The tiger helped the lion by giving him food and the pig also helped the lion, but by giving him something else.

Condition 5     A => B
    Sit.: The tiger helped the lion by giving him food but the pig didn't.

Let us now justify the different conditions considered. Conditions 0 and 5 simply allow us to assess children's ability to give an adult reading, but they do not exclude the availability of other possible readings. The exclusion of other readings is allowed by the other conditions.

Following the format in Grodzinsky's test, each sentence mentioned three different characters that were also mentioned in the stories. In conditions 1, 2 and 3, the lack of correspondence between the context and the sentence is determined either by the interpretation of the elided indirect object (included in the elided VP) or by the interpretation of the entire conjoined clause, including the elided VP. In condition 4, the interpretation of the direct complement in the elided VP was enough to determine the lack of correspondence.

Condition 2 raises a particular problem, particularly in the case of ellipsis licensed by main verb. In this condition, when VP ellipsis is licensed by a main verb, the test sentence (in 14) may be interpreted as true if the omitted material is interpreted as corresponding only to the object – this is the interpretation in (14a). We think of the interpretation in (14a) as a null object interpretation and of the interpretation in (14b) as VP ellipsis interpretation.

(14)
Situation: The tiger gave food to the lion and the pig gave food to the tiger.
Test sentence: *O     tigre    deu     comida ao     leão*
the   tiger   gave    food     to+the lion
*e     o   porco também deu.*
and the  pig     also     gave
a. [-] = comida
          food
b. [-] = comida   ao     leão
          food      to+the lion

Although the majority of the adults interpreted the test sentence in condition 2 according to a VP ellipsis reading (14b), as expected, the two possibilities for interpretation were made explicit by one of the adult subjects, who finally chose the reading (14a).

But, interestingly, some speakers agree that it is also possible to admit
a similar interpretation when the sentence includes VP ellipsis
licensed by an auxiliary, as in (15). This means that, if the reading in
(15a) is accepted, the sentence may be judged true.

(15)
Situation: The tiger is giving food to the lion and the pig is giving
food to the tiger.
*O   tigre está   a       dar comida      ao       leão e  o      porco*
the tiger is      PREP   give food        to+the lion and the    pig
*também está.*
also     is
'The tiger is giving food to the lion and the pig is too.'
a. [-] = a        dar       comida
        PREP    give     food
        'giving food'
b. [-] = a        dar       comida ao      leão
        PREP    give     food     to+the lion
        'giving food to the lion'

In this case, however, it seems that the reading in (15a) still is a case
of VP ellipsis, since we have a stranded auxiliary licensing ellipsis. To
a certain extent, (15a) would be similar to VP ellipsis examples in
English presented by Johnson (2004), such as (16) below. In (16) not
all material in the VP gets deleted.

(16) Because someone had given money to politicians, we did __ to
charities.

(Johnson 2004: 10)

A detailed discussion of the ellipsis structure that would allow (15a)
or (16) is beyond the scope of this paper, but it may be considered that
in these cases only a low vP in a VP shell is deleted (for a discussion
of this type of proposal, see Johnson 2004).[8]
       The evaluation of results in this test item may thus indicate
preferences in interpretation.
       The discussion of the particular problems raised by Condition
2 shows that the interpretation of test results are not always the same
in cases of ellipsis licensed by a main verb and ellipsis licensed by an

auxiliary. Therefore, both test items with main verbs and test items with auxiliaries were included, in those conditions were this is relevant for the interpretation of the results (see condition 2) and in the other conditions were the interpretation of subjects and indirect objects in the second conjoined clause was relevant (conditions 1 and 3) as well as in condition 0 (the match case). In condition 4 only a test item was included in which VP ellipsis was licensed by a main verb; in condition 5, only a test item was included, with VP ellipsis licensed by an auxiliary. This design allowed an overall comparison between ellipsis licensed by auxiliaries and ellipsis licensed by main verbs, as well as a special attention to the interpretation preferences in Condition 2. At the same time, since only in two cases the test condition was split in two sub-conditions, one with an auxiliary and another with a main verb, this design allowed the number of test conditions and sub-conditions to remain at a reasonable level.

The subjects were divided in two sub-groups, each of them including children of all age levels considered (sub-group A: 26 subjects, 4;7.10 – 6;7.26, mean 5;9; sub-group B: 18 subjects, 4;5.28 – 6;6.4, mean 5;4). Each sub-group answered a sub-test containing test items for conditions 1 to 5 and all the sub-conditions defined in these cases; as for condition 0, the match condition, the sub-group A answered the version with a main verb and the sub-group B the version with the auxiliary verb. The order of presentation of the test items corresponding to the different conditions and sub-conditions was different in the two sub-groups. Five non-linguist adults were tested as a control group.

As usual, when the subjects evaluated the test sentence as false, the experimenter asked for a justification. Also as usual, all unclear answers were disregarded.

## 4.2. Results

The results from the five adults showed that adults interpreted the test sentences as expected, except in three cases, two of them answers presented by the same subject. One of the answers is given in

condition 2 with a main verb licensing ellipsis and was commented on in the last section; the other unexpected answers occurred in condition 1 and in condition 0. Overall, 93.3% adult answers are expected answers.

Importantly, children's results (table 3) show that children are generally able to interpret VP ellipsis. In all conditions the results show more than 70% expected answers, with a global result of 82.3% expected answers. The results also show that conditions 1, 2 and 3, which implied the evaluation of the elided indirect object (included in the elided VP) or the entire conjoined clause, are more difficult for children. However, even in these cases there are more than 70% correct answers, showing convergence with the adult grammar.

Table 3 – Comprehension results (breakdown by condition)

| Cond | 0 | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Non-adult answer | 0 | 18 22.8% | 20 25.3% | 21 27.3% | 2 5.4% | 1 2.9% | 62 17.7% |
| Adult answer | 44 100% | 61 77.2% | 59 74.7% | 56 72.7% | 35 94.6% | 33 97.1% | 288 82.3% |

Another obvious fact is that there is an effect of condition in the results, in the sense that Conditions 1, 2 and 3 have higher error rates than Conditions 4, 5 or 0. Taking into account only conditions 1 to 5 (in Condition 0 the expected answer is *yes*, in Conditions 1 to 5 the expected answer is *no*), we obtain a significant association between the condition and success in the answer ($\chi^2(4) = 15,271$, $p = .004$).[9] This difference between conditions is not the major fact discussed in this paper and should probably be left for future research. However, it is interesting to notice that the three conditions with lower results are the three conditions where recovering the indirect object was crucial to get the adult meaning; this contrasts with condition 4, where the problem was to recover the direct object. It seems that children can sometimes accept the sentence by not recovering the indirect object in the ellipsis site (and also misinterpreting the overt

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subject in conditions 1 and 3) but they cannot accept the sentence if the direct object is not recovered. This recalls the discussion about condition 2 (see section 4.1.).

Another relevant set of facts comes from the comparison of different age groups. The breakdown of the results by age group (4, 5 and 6 year-olds) shows that in all groups correct answers correspond to at least 77%, allowing to assume adult knowledge in all groups (see table 4). This is the major fact discussed in this paper. The same table shows increase of accurate answers, even though this effect is not significant ($\chi^2(2) = 1,995$, $p > .05$).

Table 4 – Comprehension results (breakdown per age group)

| Age | 4 | 5 | 6 |
|---|---|---|---|
| Non-adult answer | 14 | 35 | 13 |
| | 22.6% | 18% | 13.8% |
| Adult answer | 48 | 159 | 81 |
| | 77.4% | 82% | 86.2% |

Another relevant comparison should be the rate of correct answers in items with VP ellipsis licensed by an auxiliary and in items presenting VP ellipsis licensed by a main verb. The results in table 5, which represents the number of correct answers in both cases across the different age groups, show that in both cases, and in the three age groups, children maintain an adult interpretation of the test items, i.e. a VP ellipsis interpretation.

Table 5 – Main verbs vs. auxiliaries

| Age | Main verb | Auxiliary |
|---|---|---|
| 4 | 25 (em 31) | 23 (em 31) |
| | 80.6% | 74.2% |
| 5 | 80 (em 101) | 79 (em 93) |
| | 79.2% | 84.9% |
| 6 | 44 (em 51) | 37 (em 43) |
| | 86.3% | 86% |

Finally, let us look at the results obtained in condition 2. As shown before, this condition allowed different readings. In the case of sentences with a stranded main verb, the sentence could be interpreted either as VP ellipsis or null object; in the case of sentences with a stranded auxiliary, two VP ellipsis were available, one where the entire VP is deleted (the standard one) and other where only a low vP in a VP shell is deleted (see section 4.1). It was therefore possible to use condition 2 results to investigate preferences in readings. The results show that children, as well as adults, prefer the VP ellipsis reading. When the test sentence presented ellipsis licensed by a main verb, children gave 83.8% (31 out of 37) answers according to a VP ellipsis reading (i.e. a 14b reading); when the test sentence presented a stranded auxiliary, children still preferred a canonical VP ellipsis reading (66.7% of the answers, 28 out of 42), although in this case the preference was not so clear.

## 5. Conclusion

The results obtained in the comprehension experiment do not support the suggestion, as in Grodzinsky (2005), that children do not constrain their interpretation of VP ellipsis contexts in the same way as adults. On the contrary, they indicate that children are able to use the discourse context to determine the interpretation of the omitted material and they thus must know that an elided VP has a linguistic antecedent.

However, the fact that children do not perform at the same level in different conditions opens the possibility of further discussion. More research is needed to determine the exact factors that make some conditions more difficult than others. Another relevant discussion concerns the comparison between the methodologies used in Grodzinky's task and in this task: it is possible that the picture selection task is more difficult than the task used in this case (see Crain & Thornton 1998); it is also expected that in a task where plausible dissent is not respected the error rates increase (see Crain et al. 1996; Crain & Thornton 1998) – this would mean that at least part of the error rates found in Grodzinsky's task would be an effect of the methodology used.

Generally, the experimental results show that the children tested are able to operate at the syntax – discourse interface. As suggested by Wijnen, Roeper & van der Meulen (2004) and Wijnen and Roeper (2005), ellipsis may well be one of the first types of discourse integration that children master. And Portuguese, a language in which VP ellipsis is generalized to all verbs and used in frequent contexts, such as answers to yes-no questions, may well be a good language to study this phenomenon.

## Notes

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2. As noticed by an anonymous reviewer, this is indeed not very different from a parameter: if we admit that there are several features E ($E_{VP}$, $E_{IP}$ $E_N$ ), children must determine which ones are available in their language.
3. See Reinhart (2006) for an approach to anaphoric destressing which is particularly relevant, since it explains how anaphoric destressing and stress shift interact.
4. Guo et al. (1996) obtains the same results by testing Chinese children (3;5 – 6;11) in an act-out task.
5. Inês was videotaped by Maria João Freitas for her PhD research (Freitas, 1997) and for the project PCSH/C/LIN/524/93 developed at Laboratório de Psicolinguística da Faculdade de Letras da Universidade de Lisboa.
6. Santos (2006) argues against this hypothesis, based on learnability arguments and crosslinguistic comparisons.
7. The test was also applied to five other children, whose results were excluded. In one case, we identified a 'yes bias' case; in the other cases, all the experimenters agreed that the children were not paying attention.
8. Kayne (1984) argued that some PPs occur in the configuration [$_{v'}$ V NP] PP. This would create a configuration that would allow a lower vP not containing the PP to be elided.

9.  There was no child effect (only two children among the 44 that were tested gave a significant number of non-adult answers).

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