Subordinate CP and pro-drop: evidence for degree-n learnability from an experimental study of Spanish and English

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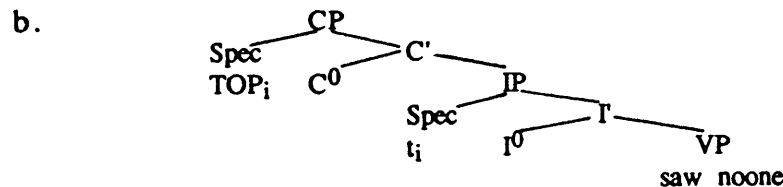
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I. Introduction

Recent research on the grammar of null subjects has led us to focus on subordinate structures (like 1 and 2) which show a well-known contrast with respect to subject-drop between English and Spanish:

1   a.   *John took off his coat when ___ walked in
    b.   Juan se quitó el abrigo cuando ___ entró

2   a.   *John said that ___ walked in
    b.   Juan dijo que ___ entró

We have chosen to study children's knowledge of the pro-drop property of their target language in subordinate domains because, for both the adult and the child, the null subject phenomenon in main clauses recently has been found to be subject to different analyses and, thus, its explanation is confounded. For example, the adult "diary register" (as in 3a) which was described in Haegeman 1990, led her to propose a topic-drop analysis for main clause subject omission, as shown in 3b.

3   a.   "A very sensible day yesterday. ___ saw noone. ___ took the bus to Southwark bridge... ___ walked along Thames St."
(V. Woolf, Diary, v.5:203-4; in Haegeman, 1990)

b.

```
                        CP
                Spec         C'
                TOP_i   C^0        IP
                            Spec        I'
                            t_i    I^0        VP
                                            saw  noone
```

Haegeman argues that, as in V2 languages like German and Dutch, the grammar of the diary register in non pro-drop languages allows for a discourse bound null operator (TOP) (cf. Huang, 1984) in the matrix Spec CP which binds a variable in subject position (its trace in Spec IP)[1].
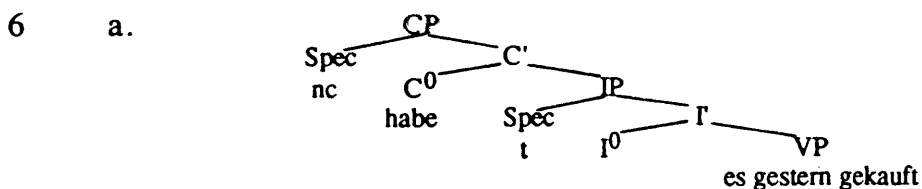
More recently, Rizzi (1992) has argued that instances of child language subject-drop, as in 4, are instances of the same phenomenon as null subjects in diary contexts.
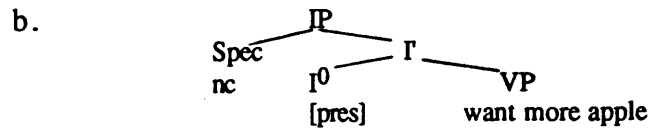
4   a.   ___ want more apple   (natural speech EricIII (22,0);
     b.   ___ not making muffins   in L.Bloom, 1970)

Rizzi has also assimilated the case of subject drop in colloquial German, as in 5, (which has been standardly analyzed as topic-drop) to subject drop in 'diary registers' and early child speech.

5   ___ habe es gestern gekauft
     '(I) have it yesterday bought'   (colloquial German; in Rizzi, 1992)

To account for these occurences of "root" null subjects, Rizzi has proposed an analysis which involves a null constant empty category[2]. 6a interprets the structure proposed for 'root' null subjects in the colloquial speech of V2 languages; 6b interprets his proposal to explain 'root' null subjects in early child speech[3]:

6   a.

```
                        CP
                Spec         C'
                nc     C^0        IP
                        habe   Spec        I'
                                t    I^0        VP
                                            es gestern gekauft
```

b.

These alternative grammatical accounts for null subjects, essentially confound the evidence for a 'pro-drop' parameter from main clause subjects (particularly utterance initial ones) for both child and adult language. The existence of main clause null subjects in the adult speech of non pro-drop languages confounds the empirical facts as well. We, thus, turn to subordinate domains.

The observations from natural speech in 7 suggest that in English, German and French (non-pro-drop languages) children, like adults, correctly appear to avoid null subjects in subordinate clauses. In her extensive study of the natural speech of children acquiring English or Italian, Valian (1991) reported that, in English, null subjects very rarely occurred in subordinate clauses or after a fronted wh-phrase[4]. Observational data like that in 7 have led Roeper and Weissenborn to speculate that subordinate clauses constitute a "unique triggering domain" (147) for pro-drop and have led Rizzi to formulate the hypothesis that children are constrained by "...an early fixation of the Null Subject Parameter"(4).

7   a. __ know what I maked   (Adam 31, in Rizzi, 1992)
       b. lass mal gucken wo das das is
          'let PART see where that that is'   (B: 2;8;16, in R&W, 1990)
       c. si on fait pas de lumiere, ben on voit pas bien
          'if one makes not light, PART one sees not well'   (P: 2;8;8, in R&W, 1990)

This initial evidence for the child's early knowledge of pro-drop in subordinate domains bears on several current and fundamental debates. (See the introduction to Lust, Hermon and Kornfilt (eds.) for a review of these). First, it calls into question the need for postulating 'markedness' of the pro-drop parameter in the Initial State (see Hyams 1986, 1989; Valian, 1990). Second, it bears on widespread speculation in the literature that children's early grammars may be limited to juxtaposed or coordinate structures (see Lebeaux, 1988, Tavakolian, 1977, 1981; cf. Cohen Sherman and Lust, 1993, Lust, to appear). Third, it also bears on widespread speculation that children's early grammars lack functional projections, in particular the CP projection (see Lust, Suñer and Whitman, eds., to appear). Finally, this initial evidence also bears on the postulation that children's language acquisition is constrained by 'degree-zero' data, as proposed by Lightfoot (1991):

8   Degree-zero learnability: "... a restriction that only structurally simple data set parameters, viz. data of degree-0 complexity drawn from unembedded domains." (Lightfoot, 1991)

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This proposal in 8 has been debated by Roeper and Weissenborn (1990), as well as others (see Commentary to Lightfoot, 1991). Essentially, a principle of "degree-zero learnability" proposes that children consult only unembedded domains at early periods of language acquisition. If this were true, CP subordination would not be available to the child and thus it could not provide a critical domain for either demonstrating or triggering early pro-drop knowledge.

Natural speech data alone (such as in 7) do not provide sufficient evidence regarding the child's knowledge of the grammar of CP subordination. Thus they do not allow firm conclusions on the critical debates. In general, as is well known, young children in their early language appear to be under a length constraint and do not frequently produce complex sentences in their natural speech. In addition, arguments based on 7 rest on the premise that other utterances with null subjects do not exist elsewhere in child speech, which can never be clearly confirmed on the basis of observational data alone[5]. It is important to obtain evidence from more than a few children in order to generalize results and draw conclusions regarding the 'Initial State'. Experimental research is, therefore, required.

II.   Our Study

In this paper, we present results from a cross-linguistic experimental study of children's knowledge regarding pro-drop in subordinate clauses. We test 9:

9   Hypothesis:
         If the early child grammar of English differs significantly from the early
         child grammar of Spanish (reflecting the correct pro-drop setting in their
         adult grammar), then this difference should be reflected in the subordinate
         domain.

If the hypothesis in 9 were true, then even in the earliest measurable periods of language acquisition we would find knowledge of the constraint against null subjects in subordinate clauses in English (a non pro-drop language). This would contrast significantly with production of null subjects in the speech of children acquiring Spanish (a pro-drop language).

1.0   DESIGN

Our design compared matched samples of children acquiring English to children acquiring Spanish using identical experimental methods, and matched experimental sentences[6]. All children imitated a total of 16 sentences (8 experimental conditions) presented in randomized order (see Table 1).

TABLE 1: Experimental Sentences

ENGLISH	SPANISH

COORDINATION

N-N

1. **Mickey** sneezes and **Mickey** whistles	1. **Mickey** canta y **Mickey** silba
2. **Big Bird** mumbles and **Big Bird** sneezes	2. **René** baila y **René** salta

N-p

3. **Bunny** jumps up and **he** falls down	3. **Donald** viene y **él** baila
4. **Oscar** stands up and **he** dances	4. **Oscar** entra y **él** juega

SUBORDINATION

adjunct postposed

N-N

5. **Pluto** sneezes when **Pluto** wakes up	5. **Pluto** tose cuando **Pluto** llora
6. **Oscar** whistles when **Oscar** jumps up	6. **Oscar** silba cuando **Oscar** salta

N-p

7. **Mickey** stands up when **he** dances	7. **Mickey** juega cuando **él** viene
8. **Big Bird** stretches when **he** lies down	8. **Ernie** grita cuando **él** habla

adjunct preposed

N-N

9. when **Mickey** comes in, **Mickey** whistles	9. cuando **Mickey** entra, **Mickey** silba
10. when **Ernie** listens, **Ernie** sits up	10. cuando **Ernie** corre, **Ernie** suda

N-p

11. when **he** listens, **Bunny** sits up	11. cuando **él** duerme, **Donald** ronca
12. when **he** falls down, **Oscar** cries out	12. cuando **él** juega, **Oscar** grita

complement postposed

N-N

13. **Bunny** says that **Bunny** dances	13. **Donald** dice que **Donald** baila
14. **Big Bird** says that **Big Bird** sneezes	14. **René** dice que **René** corre

N-p

15. **Pluto** says that **he** goes out	15. **Pluto** dice que **él** sale
16. **Ernie** says that **he** comes in	16. **Ernie** dice que **él** habla

Testing the hypothesis in 9 requires testing children's knowledge of subordinate structures. Our experimental design, thus, must provide evidence that chidren are analyzing the subordinate structure. For this reason, we contrasted children's performance (within both Spanish and English) on subordinate structures to closely matched coordinate structures (summarized in Table 1).

Data from adult English and Spanish show that subordination and coordination differ structurally in both languages[7]. The following examples show that the connectives and and when (y and cuando in Spanish) cannot occupy the same position:

10   a. i. I know that John came in late **and that** he missed the talk
         ii.*I know that John came in late **when that** he missed the talk

      b. i. Sé que Juan llegó tarde **y que** se perdió la conferencia
         ii.*Sé que Juan llegó tarde **cuando que** se perdió la conferencia

The examples in 11 show that, in both languages, the connective and/y (unlike the complementizer when/cuando) is not within the CP which constitutes the sentential subject:

11   a.   i.   [**That** John will be late] is uncertain
            ii.   [**When** John will arrive] is uncertain
           iii.   *[**And** John will arrive] is uncertain

      b.   i.   [**Que** Juan llegará tarde] es incierto
            ii.   [**Cuándo** Juan llegará] es incierto
           iii.   *[**Y** Juan llegará] es incierto

This difference between coordination and subordination is linked to the possibility for a null subject, as shown in 12 and 13:

12   a. John is feeling better and ___ soon will come back to work
      b. Juan está sintiéndose mejor y ___ pronto regresará al trabajo

13   a. John said [that he was feeling better] and [that *___ soon would come
                                                            back to work]
      b. Juan dijo [que estaba sintiéndose mejor] y [que ___ pronto regresaría al
                                                            trabajo]

In coordinate structures, like 12, null subjects are optionally allowed; in contrast, in subordinate clauses, like 13, only Spanish allows null subjects[8].

If the hypothesis in 9 is true, we should find a higher production of null subjects in coordination than in subordination in English and a higher production of null subjects in Spanish than in English in subordinate sentences, although not necessarily in coordinate sentences.

As Table 1 shows, we tested two types of subordinate clauses: adjunct clauses (examples 5 through 12) and complement clauses (examples 13 through 16). This allowed us to test children's knowledge of different subordinate C^0 types. It also allowed us to test whether the early child grammar of English allows *that*-complementizer omission (as the adult grammar of English does) and whether this would affect the type of subject used in the subordinate clause.

The adjunct clauses were tested both in postposed and preposed position (as in examples 9 through 12). This was for two reasons: first, if children do correctly analyze subordination in terms of the lexical C^0 head, then even when the subordinate clause is preposed, children should continue to block a null subject in the subordinate clause, while for the Spanish child it could still be an option. Second, when the subordinate clause is preposed, the main clause is no longer initial. Thus although our study was not specifically concerned with main clause subjects, this design allowed us to test the role of the utterance-initial effect on main clause null subjects.

We tested two types of possibilities for subject reduction: either the main clause subject was repeated in the second clause (marked as 'noun-noun' (N-N) sentences) or the stimulus sentence contained a pronoun in the second clause (identified as 'noun-pronoun' (N-p) sentences). For example, in a subordinate clause like 6: "Oscar whistles when Oscar jumps up", a lexical pronoun would be the only possibility for subject reduction in English; while, in Spanish "Oscar silba cuando Oscar salta" would allow further reduction to a null subject. The examples were designed so that a coreferential interpretation of the pronoun would be favored.

The reason for using nominal redundancy was to trigger children's 'reduction' of a noun subject. The child will tend to avoid redundancy by using a pronominal form (lexical or null), in accord with her/his grammar (cf. Chien & Lust, 1985). As in the adult grammar, we assume that the constraint on coreference between two R-expressions in a c-commanding relation (Condition C of the Binding Theory) may be also operative in children's grammars (cf. Lust, Eisele & Mazuka, 1993)[9]. Redundancy will be avoided for pragmatic reasons in any case.

If hypothesis 9 is true, in subordinate structures, we would expect English and Spanish to differ. In English we would expect to find reduction to a lexical pronoun but not to a null subject in subordinate clauses although this constraint need not apply to coordinate structures. In Spanish, in contrast, we would expect

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reduction, either to a lexical pronoun or to a null subject in the subordinate domain. In coordinate structures, across the two languages, we would expect possible reduction to a lexical pronoun or to a null subject[10].

2.0   SUBJECTS

As Table 2 shows, we tested 105 subjects, in closely matched developmental samples of Spanish (a paradigm pro-drop language) and English (a paradigm non pro-drop language) monolingual children. The English children were tested in the US, the Spanish children in Puerto Rico. Their ages ranged from 2,2 to 4,5 (yrs,mos.). Children were tested as early in their process of overt syntactic language development as was possible with our experimental methods.

Table 2: Subject Information

Group	Age Range	SPANISH		ENGLISH	
		#Subjects	mean age	# Subjects	mean age
1	2,2-2,11	5	2.8	9	2.7
2	3,0-3,5	17	3.1	8	3.2
3	3,6-3,11	28	3.9	14	3.9
4	4,0-4,5	13	4.2	11	4.3
TOTAL	2,2-4,5	63	3.5	42	3.5

3.0   METHODOLOGY

To test the hypothesis in 9, we used an elicited imitation task according to standardized experimental methods. It is known from previous research that children analyze and reconstruct the stimulus sentences in their imitation (e.g. Lust, Chien and Flynn, 1986).

4.0   RESULTS

In this paper, we present a selection of our results. Tables 3a and 3b show that the Spanish and English groups were closely calibrated in their general performance.

Table 3a: Overall Calibration of the English and Spanish Groups (% of items)

	No Change	Types of Change		
		2 Clause	1 Clause	Other
ENGLISH	43.60%	34.82%	17.86%	3.27%
SPANISH	38.10%	33.04%	24.50%	3.17%

Table 3b: Calibration of the English and Spanish Groups (% of items)

	Amount of Change	
	from Noun-noun	from Noun-pronoun
ENGLISH	64.58%	47.32%
SPANISH	73.61%	50.20%

Table 3a essentially evaluates whether the child did or did not change the stimulus sentences when imitating them. It shows that children made changes to a similar degree in Spanish and English. Table 3b shows that the percent for amount of change was greater for the noun-noun sentences than for the noun-pronoun sentences in both languages. This shows children were responding to the redundancy in the stimulus sentences.

4.1 Coordination vs. Subordination

In the coordinate structures, we found that the English and Spanish children produced a null subject to a similar degree: 5.88% reduction to a null subject from a redundant noun in English vs. 9.28% in Spanish; 17.81% reduction to a null subject from a pronoun in English vs. 12.50% in Spanish (% of 2 clause responses).

When we contrasted amount of reduction to a null in Noun-noun and Noun-pronoun sentences in coordination (e.g. 1-4) and in postposed adjunct subordination (e.g. 5-8), we found that children reduced to a null significantly more often in a coordination than in a subordinate clause in English (t = 1.983, p=.017 in a two-tailed t-test for unequal n-values) but not in Spanish (t = 1.971, p=.134).

These results contrasted with the subordinate domains. Figure 1a shows the amount of conversion to a null or to a pronoun from noun-noun subordinate sentences; i.e., whether the child generated "Bunny says that he dances" or "Bunny says that ø dances" for a sentence like "Bunny says that Bunny dances".

Figure 1a. Subordinate Postposed Adjunct (N-N): conversion to null or to pronoun (% of 2 clause responses)
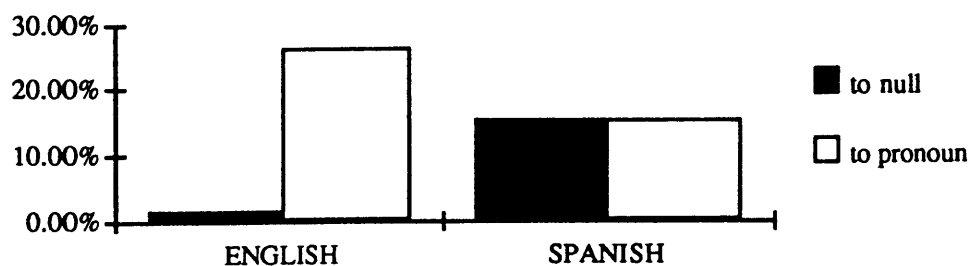
There was a significantly higher amount of null subjects in Spanish than in English subordinate adjunct clauses: $t = 1.997$ ($p=.007$) in a two-tailed t-test for unequal n-values. In contrast, we found a similar rate of amount reduction to a lexical pronoun across the two languages in these subordinate domains. Figure 1b shows these results broken down into the different age groups:

Figure 1b. Subordinate Postposed N-N Sentences (Complement or Adjunct): conversion of the subordinate subject to null or to lexical pronoun per age group (% of 2 clause responses)
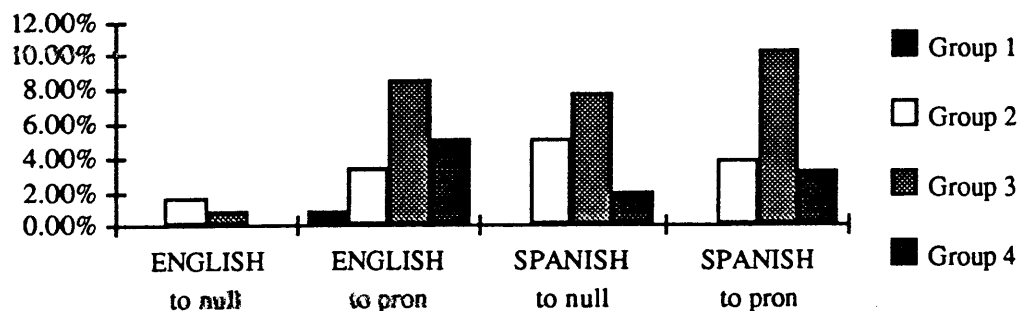
4.2   Preposed structures: main non-initial subject

The constraint on use of null subjects found in subordinate clauses for the child acquiring English was also found in main non-initial clauses. For a sentence like "When Ernie listens, Ernie sits up", children acquiring English would only reduce redundancy with a lexical pronoun, never with a null in either main clauses or subordinate clauses. In contrast, in Spanish, the child would produce "cuando Mickey entra, ø silba" or "cuando Mickey entra, él silba" to the stimulus sentence "cuando Mickey entra, Mickey silba".

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4.3 Structural Conversions

Our results also show that, in both languages, children convert both from subordination to coordination and from coordination to subordination, showing that they are not limited to coordination alone. These conversions appeared to be structure-dependent in specific ways. For example, children distinguish the different C^0 types. In both languages we found more conversion to coordination from an adjunct clause than from a complement clause, showing a non-random relation between coordination and subordination.

4.4 Complementizer Omission

Figure 3 shows that, in English, a child would predominantly generate "BigBird says ___ BigBird sneezes" for "BigBird says **that** BigBird sneezes". In Spanish, in contrast, children almost never generated complementizer omission: "*René dice ___ René corre" for "René dice **que** René corre"; where adult Spanish does not allow this. This result evidences a sensitivity on the part of the child to C^0 itself, in a way which reflects the adult grammar[11].

Figure 3: Complementizer Omission (% of 2 clauses)
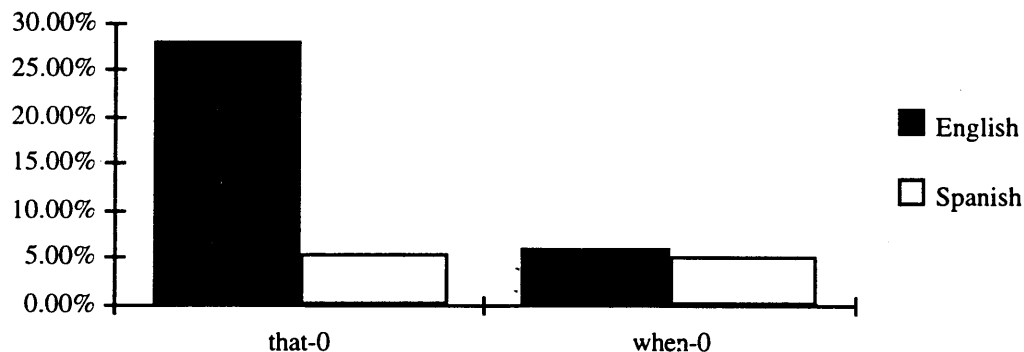
4.5 One-Clause Data

Figure 4 shows the percentage of single clause responses with null subjects from adjunct, complement and coordinate Noun-pronoun stimulus sentences. Most of these data come from the youngest age group and reflect a 'recency effect' where the child gave the second clause.

Figure 4: Null Subjects in One-Clause Data from Adjunct, Complement and second conjunct in Coordination (% of One-Clause Responses)

	ENGLISH	SPANISH
ADJUNCT	0.00%	22.73%
COMPLEMENT	10.53%	25.59%
COORDINATE	25.00%	29.17%

These results indicate that, even in the most primitive responses, children appear to be constrained by the rules of adult grammar showing significant cross-linguistic differences. In English, single clause responses from subordinate stimuli yield very few null subjects. However, in Spanish, as well as in English coordinate sentences, children respond with a greater percentage of null subjects in their single clause responses. It appears, then, that children process the stimuli as two clause sentences, even distinguishing subordination and coordination when they respond with only single clauses.

4.6   Qualitative Data

Table 4 exemplifies spontaneous structural conversions that children gave: from subordination to coordination and from coordination to subordination. These data basically show, in accord with our group statistical data, that English children know about the constraints on subject reduction, since they restrict the occurence of nulls to the coordination domain, even when spontaneously generated. Children acquiring Spanish, also avoid redundancy but, contrary to what the English child does, they produce both pronouns or null subjects in all domains. This is true even for the youngest ages.

5.0   DISCUSSION OF RESULTS

These experimental results provide strong evidence in favor of the hypothesis in 9. In general, they provide evidence in favor of what we have called elsewhere the 'Strong Continuity Hypothesis' of UG (Lust, to appear; Whitman, Lee and Lust, 1991; Boser, Santelmann, Lust & Whitman, 1991). Specifically, these results support very early knowledge of the correct grammar for pro-drop, which is reflected in significant differences across our matched Spanish and English samples with regard to this phenomenon. It is reflected in the nearly absolute 'constraint' against allowing pro-drop (that is, null subjects) in several forms of subordinate clauses we have tested in the English sample, even though children acquiring English do more freely allow subject reduction in coordinate sentences. The fact that children make this distinction (and several others) between subordinate and coordinate domains provides evidence for early knowledge of subordination where the subordinating connective occupies C^0 position in a CP projection, in

Table 4: Qualitative Data

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A. ENGLISH

Conversions to Coordination

Experimenter:	Child: null subject
when Mickey comes in, Mickey whistles	(2,5) **Mickey come in and ø whistles**
Pluto sneezes when Pluto wakes up	(2,8) **Pluto wakes up and ø sneezes**

	Child: pronoun
Oscar whistles when Oscar jumps up	(2,8) **Oscar sits up and he whistles**
When Ernie listens, Ernie sits up	(3,0) **Ernie listens and he sits up**

Conversions to Subordination

Experimenter:	Child: pronoun
Oscar stands up and he dances	(2,10) **Oscar stands up when he dances**
Big Bird mumbles and Big Bird sneezes	(3,4)**BigBird mumbles when he sneezes**

B. SPANISH

Conversions to Coordination

Experimenter:	Child: null subject
René dice que René corre	(3,3) **René salta y ø corre**
Pluto dice que él sale	(3,0) **Pluto entra y ø sale**

	Child: pronoun
cuando Ernie juega, Ernie grita	(3,0) **Ernie juega y él grita**
Oscar silba cuando Oscar salta	(3,3) **Oscar salta y él silba**

Conversions to Subordination

Experimenter:	Child: null subject
Mickey canta y Mickey silba	(3,0) **cuando Mickey canta, ø silba**
Oscar canta y él baila	(3,7) **cuando ø canta, Oscar baila**

René baila y René salta	(2,6) **cuando él baila, él salta**
René corre y René salta	(3,0) **René dice que él salta**

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distinction from the coordinating connective. Taken together, the results support the hypothesis that the knowledge of cross-linguistic variation in pro-drop is more transparently evidenced in subordinate clause domains, thus according with the speculations raised by Roeper & Weissenborn, 1990 and Rizzi, 1992, and with the results of Valian, 1991 concerning Italian-English comparisons.

These results do not accord with a 'degree zero' limitation on child grammars, hypothesized in 8 above. In fact, they (like other evidence, e.g, Lust, to appear) support a subtle sensitivity to the CP subordination domain in child grammars. Since this domain is recursive, we conclude that there is no need to limit child grammars to any 'degree-below-n' in the child, just as there is none in the adult[12]. It might be counterargued here that simply showing that children control grammatical knowledge in subordinate CP domains does not confirm that this knowledge has not been 'learned' on the basis of the main clause, and generalized to subordinate clauses. As we have shown, however, given the empirical variation and theoretical confounds which characterize the null subject in main clauses, it is not clear how this learning could be achieved; especially not how the 'obligatory' character of the constraint against null subjects in the non pro-drop English sample could have been so achieved and so generalized in distinction from the Spanish, and in distinction from coordinate structures[13].

Finally, it may be counterargued that although these data do not evidence any discontinuity in child grammars down to the youngest ages we tested, i.e., 2yrs, 2months, it is still possible that some grammatical discontinuity does exist at even younger ages. This, of course, remains an *a priori* possibility. Notice, however, that if this is the case, the hypothesis for this restricted discontinuity hypothesis may not be subject to experimental test[14];thus it may not be testable for disconfirmation. This is particularly serious, given the indeterminacy of interpretation of anecdotal observations of children's natural speech utterances, which we noted above.

Finally, it must be recognized that the data we have reported have included 'one clause' responses from children; presumably reflecting the fact that the youngest children we tested included those at a very primitive level of language, one wherein complex sentence formation (in their production) was still difficult for them. Even these very primitive data reflected cross-linguistic differences, continuous with results from the 2-clause data across Spanish and English samples with regard to pro drop[15].

In the face of these arguments, we must conclude that the null hypothesis is the "strong continuity hypothesis" of UG, and it includes degree-n 'learnability' with regard to first language acquisition.

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Endnotes

1.   This analysis is not without problems, as Haegeman herself notes. In 'diary registers', only null subjects are found; however, in V2 languages, not only subject topic-drop but also object topic-drop is possible. The apparent constraint against object topic-drop in diary contexts is, therefore, left unexplained.

2.   This proposal too is not without problems. In Rizzi's proposal, a null constant empty category can be bound or unbound. It will be bound if the grammar makes available a non-quantificational null operator that will bind its trace (the nc) in Spec IP, from Spec CP. It will be unbound in a structure like that in 6a and 6b, where the nc empty category, in each case, occupies the highest A-position in the structure. The licensing requirement of the ECP does not apply to the unbound nc, if restricted to the case in which a head intervenes between a null element and its identifier (see fn11, Rizzi 1992). The unbound nc is also exempt from the identification requirement of the ECP. With respect to how the unbound nc empty category would, then, be interpreted, "the unbound null constant can survive in the Spec of the root (...)and receive its referential value in discourse". The precise mechanism which would allow this to happen is left without explanation. The status of Spec CP in V2 languages is also debated given that it is also the landing site for *wh*-phrases, for example.

3.   In this paper we will not discuss the suggestion made by Rizzi that early child grammars lack the functional projection CP (or that it is not obligatory but, instead, is only triggered by a fronted element such as a wh-phrase; cf. Grimshaw, to appear). However, we believe there is convincing evidence that the CP projection is in fact present in the earliest grammars of children (see Boser et.al., 1991 and Lust, to appear); as our evidence in this paper will also show.

4.   The fact that in at least these two contexts null subjects are not found, suggests that subject omission raises a more general issue, which could be related to a constraint on government of the subject by a 'filled' C^0 head. This, would obviate parameterization and reduce pro-drop to UG principles, instead. We leave this speculation for future research.

5.   In addition, absence of a null subject in a particular utterance may result from a number of reasons particular to that utterance. It need not result from a grammatical constraint.

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6.   These sentences were controlled for a number of factors, including number of syllables, range of words and same structural format in each language.

7.   The following examples concerning verb-raising in German also provide evidence for a structural difference between coordination and subordination (Santelmann, pc).

i. Coordination:	a. und/aber wir haben den Film nicht gesehen	
		and/but we have the film not seen
	b. *und/aber wir den Film nicht gesehen haben	
		and/but we the film not seen have
ii. Subordination:	c. weil/daß/ob wir den Film nicht gesehen haben	
		because/that/if we the film not seen have
	d. * weil/daß/ob wir haben den Film nicht gesehen	
		because/that/if we have the Film not seen

In coordination (a and b), we find the V2 effect (the verb raising to second position). In contrast, in subordinate clauses (c and d), the complementizer prevents verb-raising to C^0 position. Again, the connective cannot be in C^0 for coordination; for subordination, it must be.

8.   Notice that it is the subordinate status of the clause and not the fact that it is the second clause that is responsible for the constraint on null subjects in English, when the complementizer is overt.

9.   Lust, Eisele & Mazuka actually provided evidence with respect to the form of Principle C, wherein a pronoun c-commands a noun. They raise an issue regarding the possible non-universality of the form of Principle C involving two nouns.

10.   If a principle such as the 'Avoid Pronoun Principle' (see Chomsky, 1986, Montalbetti, 1984) were also operative in children's grammars, then we could find a higher reduction to a null subject whenever either lexical pronoun subjects or null subjects were an option. This would also apply to reduction of redundancy in subordinate structures in Spanish.

11.   Despite the general constraint against subordinate clause null subjects in the early grammar of English, the few cases of null subjects that did occur in our data mainly came from complement clauses. In English NN complement clauses, reduction of a redundant noun to a null subject was 3.77% (% of 2 clause responses) when the *that*-complementizer was overt; and 5.66% when the complementizer was dropped. Further research is required to determine the possible effect of complementizer drop on the type of subject produced.

12.   We note that the original hypothesis of limiting the child's access to data in terms of degrees (e.g., Wexler and Culicover, 1980) was based on an earlier model of linguistic theory, in which the syntactic 'cycle' could and did insinuate several levels of representation in a derivation between deep and surface structure. Current Minimalist theory (Chomsky, 1992) would obviate this restriction. The original hypothesis was also based on an earlier model of 'error driven' learning in the child. Current learnability theory also obviates this assumption (e.g., Kapur, to appear).

13.   We argue that data from embedded clauses is crucial; we are by no means arguing against degree-0 data as being relevant. It simply isn't a unique triggering domain.

14.   Our sample reaches down as young as possible with experimental methods which can be continuously applied to the child during early stages of overt language acquisition.

15.   The occurrence of null subjects in these data indicated that at least some of these involved children who would be providing occasional natural speech utterances with null subjects, like that reported in the observational literature; thus indicating intersection and continuity between the

youngest ages (not testable by experimental method) and slightly older children, beginning at 2,2 in our sample.

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