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A NULL THEORY OF PHRASE AND COMPOUND STRESS\*

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1. Introduction

Since Chomsky, Halle and Lukoff (1956), it is generally assumed that (surface) constituent structure is the fundamental determinant of phrase (and sentence) stress. A natural question that one may pose is whether, in addition to syntactic constituency and principles of Universal Grammar, we need some language-specific phonological rule as well.

The various generative treatments that have been proposed in the literature all have, either explicitly or implicitly, claimed that we do in assuming some form of Chomsky and Halle's (1968) Nuclear Stress Rule.

Here, I would like to explore the possibility that no language-specific proviso is necessary, and that the (unmarked) pattern of phrase stress can be entirely determined on the basis of (surface) syntactic constituent structure, given the word stresses and the general principles of grid construction as defined in Halle and Vergnaud's (1987) refinement of Liberman's (1975) metrical grid theory.

If correct, the argument will imply that there is no such thing as a Nuclear Stress Rule of English as distinct from a Nuclear Stress Rule of German; more generally, no such thing as a Nuclear Stress Rule. Any difference in the patterns of phrase (and sentence) stress between two languages should rather follow from their respective constituent structure, as determined by purely syntactic parameters such as the head-initial or head-final character of their phrases.<sup>1</sup>

The argument will be made on the basis of rather limited evidence, essentially a comparison of Italian, English and German. At this preliminary stage, a more careful analysis of few syntactically better known languages may be safer, and more revealing, than a superficial survey of several typologically different languages, even though some suggestive typological data will be cited (V. section 8).

Given the crucial role that the metrical grid theory plays in the argument, I begin by briefly sketching the theory in the form given to it in Halle and Vergnaud (1987).

## 2. The metrical grid theory

Within this theory, which develops an idea of Liberman (1975), stress is represented in a separate autosegmental plane, as tone. The autosegmental line for stress is a sequence of abstract positions (conventionally marked with asterisks) associated with the potentially stress-bearing positions on the central line of phonemes, as illustrated in fig.1.

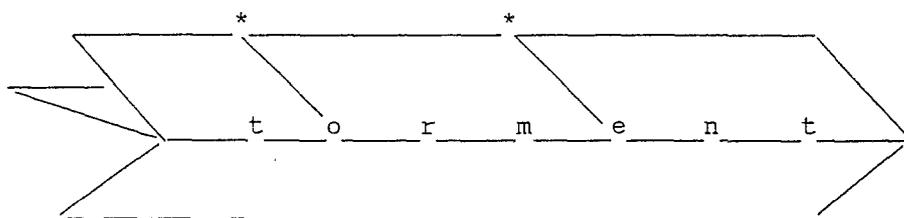


fig.1

As with other phonological entities, this formalism permits, among other things, a local computation of phenomena which appear non local on the phoneme line.

Not every potentially stress-bearing unit (e.g. a syllable nucleus) represents a stressed position, on the phoneme line. One way to mark

those that actually do is to set up an additional line on the stress plane where only these receive an asterisk, as illustrated in fig.2 with a word such as serendipity, whose first, third and fourth syllabic nuclei only are stressed.

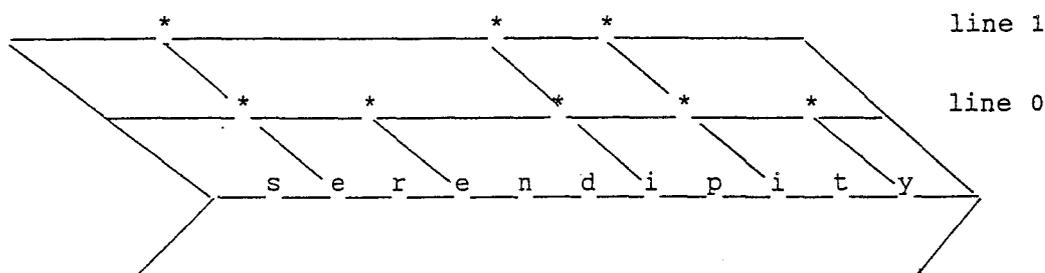


fig.2

If one of these carries a stress more prominent than the others ( as is the case with the third syllabic nucleus of serendipity), then it alone will receive an asterisk on yet a higher line 2 (not indicated in fig.2).

Since at most three degrees of stress (beside zero stress) are distinguished among stressed syllables in noncompound words, only three lines (besides line 0) will be needed to represent the main stress of individual words (cf. Halle and Vergnaud 1987).

Within this basic formalism, Halle and Vergnaud show that , by recognizing the existence of constituents on each line, and their heads (marked on the next higher line), it is possible to 'rationalize' the considerable variety and apparent capriciousness of the patterns of word stress in the languages of the world. These can, in fact, be seen as arising from different settings of the same, few, parameters and rules of constituent boundary construction : whether a

constituent on line L is bounded or unbounded (+/-BND); head terminal (in which case the further choice is between right headedness or left headedness) or not (+/-HT); constructed from left to right or from right to left.

Here, I give only a brief illustration of one of the various possibilities that follow from Halle and Vergnaud's parametric theory.<sup>2</sup> The stress pattern of Maranungku, where stress falls on all odd-numbered syllables counting from the beginning of the word, with the leftmost as the main stress, is obtained by means of the parameter settings in (1), in interaction with the general principles of grid construction (2):

- (1)a Line 0 parameter settings: +HT, +BND, left, left to right
- b Line 1 parameter settings: +HT, -BND, left
- (2)a Construct constituent boundary on line L
- b Locate the heads of line L on line L+1

The representative stress pattern of the language is thus the metrical grid (3) (where indication of the plane and the phoneme line is omitted):

```
(3) * . . . . line 2
    (* . * . *) line 1
    (* *)(* *)(*) line 0
```

The grid is obtained by means of the parameter settings (1)a-b and the rules that construct constituent boundaries (2)a-b in the following way: First, line 0 is constructed by marking with an asterisk all (potentially) stress-bearing elements in the word (taking a five syllable word as representative). Then, a constituent structure is imposed on this line applying rule (2)a in accordance with the parametric values indicated in (1)a. So bounded (binary) constituents are constructed left to right (with the last a defective constituent).

Given the positive value of the head terminal parameter and the "left" value of the headedness parameter, a head for each constituent is located via (2)b on the next higher line (line 1) over the asterisk adjacent to the left boundary of the constituent. Then, a constituent structure is imposed on line 1 by applying again rule (2)a in accordance with the parametric values indicated in (1)b. An unbounded constituent is thus built comprising all three asterisks on line 1. Given the positive value of the head terminal parameter and the "left" value of the headedness parameter, a head for the constituent on line 1 is located on line 2 over the asterisk adjacent to the left boundary of the constituent in line 1.

The correct representation of the stress pattern of Maranungku words, with the appropriate degrees of stress, is thus derived.

Different choices of the same parameters (in possible interaction with the further choices mentioned in fn.2, and others) give rise to the stress patterns found in the other languages. I refer to Halle and Vergnaud (1987), Halle and Kenstowicz (1990) for detailed discussion. In this approach, differences in degrees of stress are expressed in terms of the different heights of the associated asterisk columns, as seen.

Interesting evidence for this particular notation over potential alternatives (such as the use of different Arabic numerals) is provided by the phenomenon of Stress Shift, as found, for example, in the English Rhythm Rule cases (4) and (5):

(4)a	$\begin{array}{c} 2 \quad \boxed{0} \quad \boxed{3} \\ \text{Tennessee} \end{array}$	b	$\begin{array}{c} 3 \quad 0 \quad 2 \quad 4 \quad 0 \\ \text{Tennessee Williams} \end{array}$
(5)a	$\begin{array}{c} 2 \quad 0 \quad 3 \\ \text{Japanese} \end{array}$	b	$\begin{array}{c} 3 \quad 0 \quad 2 \quad 4 \quad 0 \\ \text{Japanese beetle} \end{array}$

Halle and Vergnaud (1987,39) note that if stress is marked with Arabic

numerals, as in (4) and (5), the rule can only be stated in an unperspicuous and unprincipled way ("Assign a highest stress number N in the lefthand constituent to the syllable with the highest stress number M on its left, simultaneously reducing the original N by one degree").

Under the metrical grid notation, instead, as observed by Prince (1983,33), the phenomenon can be expressed simply and naturally by allowing lateral movement of an asterisk on a line from one column to another (in appropriate contexts):

(6)		*		line 4 (Nuclear Stress Rule)
	. <-- *	*	.	line 3
	* . *	*	.	line 2
	* . *	*	.	line 1
	* * *	*	*	line 0
	Ja pan ese beetle			

More importantly, the major properties of the rule ((a) the fact that the position of the original main stress does not become stressless, but retains a stress weakened by one; (b) the fact that the new main stress has the same degree as the old main stress (3 in (6)); and (c) the fact that the main stress is shifted to the next highest peak to the left rather than simply to the next position to the left) now follow in a principled way. For the first two properties it is obvious how. Consider the third. It too follows if we assume that an asterisk can move to another column on a certain line L only if that column has an asterisk on the immediately lower line L-1.<sup>3</sup> If so, it is clear why the asterisk shifting to the left in (6) cannot stop in column with the second stress-bearing unit, but must proceed to the first. No asterisk is present in the second column on the next lower line.

To extend Halle's (1985) image, one could say that the grid is like a magnetic abacus. Beads can move within their respective rows, but are

forced by 'attraction' to stop in correspondence with the (first) head of the next lower row they encounter.

This condition will play a crucial role in the argument below.<sup>4</sup>

Having briefly sketched Halle and Vergnaud's (1987) theory of the stress contours of single words, let us now consider how they propose to extend the theory to the stress contours of phrases (and sentences).

### 3. The Nuclear Stress Rule: a metrical version

As is well-known, when words are combined into phrases, the stress contours of the individual words is largely unaffected, the effect of the combination merely being the assignment of greater prominence to the main stress of one constituent over that of the others. In both English and Italian, the constituent whose main stress is enhanced under normal conditions is the rightmost. This is essentially what Chomsky and Halle's (1968) Nuclear Stress Rule of English was meant to express.

Halle and Vergnaud (1987) propose to incorporate the rule in the formalism of their theory as follows (cf. their (80)):

#### (7) Nuclear Stress Rule

- a Parameter settings on line  $N$  ( $N \geq 3$ ) are [-BND,+HT,right]
- b Interpret boundaries of syntactic constituents composed of two or more stressed words as metrical boundaries
- c Locate the heads of line  $N$  constituents on line  $N+1$

The effect of this rule will be to add new lines to the metrical grid, one for each new phrase computed, from the most embedded one to the root sentence. The language-specific proviso of the rule is represented by the parameter settings in (7)a.

By way of illustration, consider the derivation of the stress contour of the sentence Jesus preached to the people of Judea (Halle and Vergnaud (1987,265)) :

```
(8)(.           .           * )   line 6
      .         ( .         .         * )   line 5
      .         .         ( .         * )   line 4
      *         *         *         *         line 3
      (Jesus   (preached to the (people of Judea))
```

The first metrical constituent built on line 3 on the basis of (7)b is that corresponding to people of Judea. In accordance with the principle of the cycle, (metrical) constituents which contain unerased brackets such as [preached to the [people of Judea]], cannot be computed until after the innermost constituent is computed (and its brackets erased).<sup>5</sup>

The head of the constituent is located on line 4 by applying (7)c. Then, a metrical constituent is created on line 4, and so forth.

Halle and Vergnaud (1987,265), noting that the procedure as such does not reflect the stress contour of the sentence correctly (with Jesus bearing more stress than preached, and the latter bearing more stress than people) propose to supplement it with the following convention

(9) Stress Equalization Convention

When two or more constituents are conjoined into a single higher-level constituent, the asterisk columns of the heads of the constituent are equalized by adding asterisks to the lesser column(s)

This has the effect of introducing asterisks in place of some of the dots of (8).<sup>6</sup>

In their theory, then, the stress contour of phrases (and sentences) is determined by means of the same rules and parameters utilized for

determining the stress contour of individual words.

#### 4. A null theory of phrase stress

Halle and Vergnaud's extension of their theory of word stress to phrase stress raises two conceptual questions:

- (10)a Are the phrase stress systems as numerous and diverse as the word stress systems, as the different settings of the [± BND, ± HT, left/right] parameters would lead one to expect?
- b Is it an accident that the Nuclear Stress Rule gives prominence to the rightmost constituent of a phrase in languages like English or Italian, which are essentially right branching (i.e., have increasing depth of embedding to the right)?<sup>7</sup>

Suppose, for the sake of the argument, that both questions receive a negative answer. Suppose, in particular, that it is no accident that the Nuclear Stress Rule gives prominence to the rightmost constituent of a phrase in right branching languages (the branching direction of the language actually implying the same direction in stress prominence).

If this is so, there is an immediate implication for the other question too. Only two general types of phrase stress systems should exist according to whether the language is left or right branching. Right branching languages should show the effects of the Nuclear Stress Rule, while left branching languages should show the reverse (essentially, the effects yielded by the Compound Stress Rule of English, which gives prominence to the main stress of the leftmost constituent). Languages with mixed branching should instead combine properties of the two 'pure' systems.<sup>8</sup>

But if the effects of the Nuclear Stress Rule (and of its reverse)

depend entirely on the direction in which depth of embedding develops, then the rules become redundant: They merely recapitulate what follows from purely syntactic parameters. Hence they should be eliminated, at least if a way exists to link the direction in which stress prominence is assigned within a phrase to the branching direction of the phrase. What I would like to suggest is that such a link is implicit in Halle and Vergnaud's procedure of grid construction: an additional distinctive advantage of the metrical grid notation over such alternatives as the metrical tree notation, which cannot derive the same result, so it appears (cf. below for some discussion).

What is apparently necessary and sufficient is the combination of (7)b, simplified as in (11)a, (7)c, repeated here as (11)b, the principle of the cycle, (11)c, essentially in its original formulation, and the condition that there be no gap in an asterisk column, (11)d.

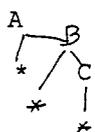
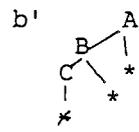
(11)a Interpret boundaries of syntactic constituents as metrical boundaries<sup>9</sup>

b Locate the heads of line N constituents on line N+1

c Each rule applies to a maximal string containing no internal boundaries

d An asterisk on line N must correspond to an asterisk on line N-1

Let us consider first a couple of simplified abstract cases to illustrate the working of (11); namely (12)a-b (or (12)a'-b' in tree format), where A,B,C are arbitrary syntactic maximal projections and the asterisks indicate the main stress of the words that constitute their heads :

(12)a [A \* [B \* [C \* ]]]      a'       b' 

b [A [B [C \* ] \* ] \* ]

(12)a-b (a'-b') represent right and left branching structures, respectively, with constituents each nested in the next higher one.

Application of (11) gives rise to the grids (13)a-b (lines below line 3 are omitted):

(13)a	*	b	*	line 6
( . . * )		( * . . )		line 5
( . ( . * ))		(( * . ) . )		line 4
( * ( * ( * )))		(( ( * ) * ) * )		line 3

Consider how. The combination of (11)a and (11)c, the principle of the cycle, imposes that the first metrical constituent to be computed is the innermost (to the right in (13)a, and to the left in (13)b). (11)b then requires us to locate the head of this constituent on the next higher line (line 4). Since the constituent has only one position, the asterisk on line 4 cannot but be in column with this position. When we pass to consider the next cycle, (11)b will again demand that the head of this constituent be located on the next line up (line 5). On line 4 there are two positions, but only one of them contains an asterisk. So, by (11)d, we have no choice. The head (on line 5) of the constituent on line 4 can only be in column with the single asterisk found on line 4. Reapplication of the same procedure gives rise to the complete grids (13)a and b.

In this fashion, stress prominence in a phrase is a mere reflection of depth of embedding. And the rightmost or leftmost location of the main stress is simply a function of the rightmost or leftmost location of

the most deeply embedded phrase (as determined by the direction of branching).

If, as I shall claim, the relation between two constituents of a phrase is always asymmetrical (in the sense that necessarily one of the two is more deeply embedded than the other), no direction of stress prominence, as in the Nuclear Stress Rule, need be stipulated. The first constituent to receive an asterisk, whether on the left or the right, will 'attract' all later asterisks.

The procedure of (11) would seem to suffer from the same deficiency as Halle and Vergnaud's Nuclear Stress Rule (7), which called for a Stress Equalization Convention to assign the appropriate degrees of stress to a sentence such as Jesus preached to the people of Judea, but this is not quite so.

It should be noted that the sentence has two non intersecting constituents, the subject NP and the predicate VP (for simplicity, I ignore now all functional and intermediate X' projections):

(14) [[<sub>NP</sub>Jesus] [<sub>VP</sub>preached [<sub>PP</sub>to [<sub>NP</sub> the people [<sub>PP</sub>of [<sub>NP</sub>Judea ]]]]]]

This means that the subject NP and the VP undergo two parallel cycles before joining at the sentence level. In particular, this means that the NP Jesus will receive a line 4 asterisk; one more than preached and people, which fail to receive one because of the innermost constituent [<sub>NP</sub>Judea], which receives it first (on line 4), thus attracting all later asterisks (those of line 5 and 6, as well as that of line 7, after the whole sentence is computed):<sup>10</sup>

(15) . . . . . \* line 7  
 ( . . . . . \* ) line 6  
 ( . ( . . . . . \* )) line 5  
 ( \* ( . ( . . . . . \* ))) line 4  
 (( \* ) ( \* ( . . . . . \* ))) line 3  
 ((Jesus) (preached ( to the people (of Judea ))))

The general consequence of this formal procedure is then that the first constituent to receive an asterisk will be the one to ultimately receive greatest stress within a phrase.

An immediate problem would seem to be posed by those cases where the subject NP has more layers of embedding than the predicate (e.g. in a sentence such as : [[the author [of many popular articles [on the effects [of senescence]]]] [[died]]]). Here the formal procedure would lead us to expect the most deeply embedded constituent of the subject NP to bear more stress than the verb in the VP. But this is not necessarily the case. I return to this problem below when discussing the relation between the proposed formal procedure and the effects of the focus and presupposition articulation of the sentence (its "information structure"). Also see the discussion at the end of section 7. Other problems stemming from predictions of this procedure that appear to fail (given certain assumptions about the constituent structure of English and Italian) will also be deferred until section 7, after some implications of this general approach have been considered in more detail.

As noted, in the hypothesis we wish to explore here, no language-specific rule (such as the Nuclear Stress Rule) should be postulated to determine stress prominence at the phrase level. Rather, phrase stress should be entirely determinable (given the word stresses) from

the independent principles (11) in interaction with such purely syntactic parameters as the head-initial or head-final parameter (responsible for the direction of embedding). As observed, the general prediction of this hypothesis is that in right branching phrases the stress prominence should fall on the main stress of the rightmost constituent (thus deriving the effects of the Nuclear Stress Rule of English), while in left branching phrases the stress prominence should fall on the leftmost (to yield, in essence, the same effects produced by the Compound Stress Rule of English).

Although some suggestive typological evidence in this direction does exist,<sup>11</sup> it may be useful to consider a specific case in some detail. German stands out as particularly appropriate to the task. Its mixed branching character allows one to test within a single language the opposed predictions of the hypothesis. Furthermore, its syntactic structure and its accentual system are both rather well known.<sup>12</sup>

In the next section, we begin with a brief excursus of the main features of German phrase stress, based in essence on the classical work of Kiparsky (1966). We will then compare the language-specific approach taken in this and subsequent works with the null approach developed above and consider a number of more subtle predictions afforded by the latter on the basis of what we now know about the syntactic structure of German.

##### 5. Phrase stress in German

Kiparsky (1966) distinguishes two different classes of phrases in German according to whether they receive stress prominence on their rightmost or leftmost constituent (p.81).<sup>13</sup>

His terms Nom and Satz, taken from Bierwisch's (1963) fragment of

German grammar<sup>14</sup>, correspond to NP and CP, respectively. The rendition of other terms is more problematic since some of them do not even seem to correspond to constituents in today's theory. So, for example, D essentially renders the notion of Mittelfeld of the German grammatical tradition.<sup>15</sup> This comprises all the constituents found between the head of CP and the head of VP; namely, the subject NP and the possible adjunct and argument XPs of the VP without the verb: a sequence that is not a constituent, apparently (but see fn.21 below). Analogously, Kiparsky's 'VP' is used for a verbal group comprising a verb plus an auxiliary (plus a complement CP if there is any), but excluding the rest of the verb's complements: again a non constituent under current assumptions, which analyse auxiliaries as heads (of an auxiliary VP) taking ordinary VPs (or AGRPs containing VPs) as their complements.

Assuming this partition of the German sentence and the fact that NPs, CPs and D receive final stress prominence, while the sequence S (=D+VP), corresponding to IP, and the verbal group 'VP' receive initial stress prominence, Kiparsky manages to derive the intricacies of German ordinary sentence stress with remarkable accuracy.<sup>16</sup>

Let us briefly consider how. The case of NPs is straightforward. They receive final stress prominence (Endbetonung):<sup>17</sup>

(16)a [Die dicke Émma]  
       the fat E.

      b [Der Mann aus Ríó]  
           The man from Rio

Concerning CPs , the stress contour of such simple root clauses as (17) is derived directly under the 'constituent' analysis in (18) (p.81):

(17)a Waldemar spielt Theater  
W. plays theater

b Die Katze lief weg  
The cat ran away

(18)a [satz[I Waldemar spielt] [STheater]]

b [satz[I Die Katze lief] [Sweg]]

S has only one word (Theater, weg, respectively); so that word will receive the primary stress of the S cycle. Although Kiparsky does not explicitly discuss the stress contour of I, it is reasonable to assume that in his system it would have left prominence. If so, the subject NP will receive the primary stress of the I cycle. When the Satz cycle, which is subject to the ordinary Nuclear Stress Rule, is reached, primary stress will be assigned to the most prominent stress to the right (namely, Theater and weg, respectively), all other stresses being reduced by one at the same time. Kiparsky's ingenious procedure will also derive the correct result in more complex cases such as (19), under the analysis indicated in (20):

(19) Hans wird einem Kind ein Buch geben können  
H. will be able to give a book to a boy

(20)[satz[IHans wird] [S[Deinem Kind ein Buch] [VPgeben können]]]

The verbal group 'VP' and I are subject to the 'Reverse Nuclear Stress Rule' so that the leftmost constituent (geben and Hans, respectively) will receive the primary stress of the cycle. D is subject to the ordinary Nuclear Stress Rule so that the rightmost constituent ein Buch will receive primary stress. When the S cycle is reached, which is again subject to the 'Reverse Nuclear Stress Rule', the most prominent stress of the leftmost constituent (namely, that of Buch) will receive primary stress, thereby causing all other stresses of that cycle to lower. Finally, when the Satz cycle is reached, which is

subject to the ordinary Nuclear Stress Rule, the most prominent stress to the right (namely, that of Buch once again) will receive the primary stress, with the concomitant weakening of all the other stresses.

In spite of its ingenuity and remarkable empirical success, Kiparsky's analysis raises, as noted, certain questions concerning the constituent structure it must assume.<sup>18</sup> But, even if all such questions could be satisfactorily answered, the fact that certain German phrases take left prominence while others take right prominence would still be treated as an accident. The theory could just as well accommodate the opposite arrangement of stress prominence. A more interesting theory, it seems, would be one which derived the right or leftmost prominence of a certain German phrase as a necessary consequence of general and independent principles.

The null theory sketched above appears to qualify as such a theory. This is because, as predicted, the leftmost or rightmost stress prominence of a German phrase appears to correlate exactly with the direction in which the phrase's depth of embedding develops.<sup>19</sup>

Let us see how, beginning with complements and delaying for a moment the examination of adjuncts and other modifiers.

Consider what value the head-complement parameter takes in each phrase.

NPs are head-initial. This means that their complements are found to their right :

(21)a Die [<sub>N'</sub>Entdeckung [<sub>NP</sub> des [<sub>N'</sub> Impfstoffs]]]  
The discovery of the vaccine

b Die [<sub>N'</sub>Landung [<sub>PP</sub> auf [dem Mond]]]  
The landing on the moon

Since the complement's head is more deeply embedded than the head N (in the sense that it is dominated by more projections than the head N), it will receive an asterisk on the first and second phrase cycles, the lower N' and NP, before the head N can at the higher N' cycle. This, in turn, will mean that the main stress of the complement will continue to attract all later asterisks, in accordance with principle (11d), ultimately bearing the strongest prominence within the largest phrase, as desired.

Except for a handful of cases (cf. (23) below), PPs are also head-initial, and in fact their stress properties are analogous to those of the NP just seen, with prominence on the main stress of the complement to the right :

- (22)a Auf den Tísch 'on the table'  
       b Durch die Zímmer 'through the room'  
       c Unter den Lín-den 'under the lime-trees'

The situation is reversed with postpositional phrases, as expected. Greater prominence is now on the left:<sup>20</sup>

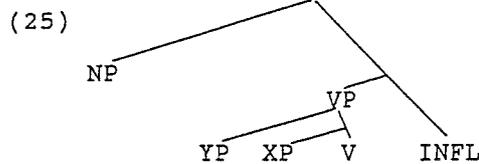
- (23)a Den Flúss entlang 'along the river'  
       b Den BÉrg hinauf 'up the mountain'

Next, consider VPs, which in German are head-final. The rough generalization is that the primary stress falls on the XP to the immediate left of the verb, or verbal group (cf. Stechow and Uhmman (1986,315), Grewendorf (1989,sect.4.3), among others).

- (24)a ..dass Hans [ ein Buch auf den Tísch gestellt ] hat  
       ..that H.       a book   on the table put       has  
       b ..dass Fritz [ einem Kind GÉld gegeben ] hat  
       ..that F.       to a child   money given   has  
       c ..dass Karl [ ein Buch mit Mühe lesen ] kann  
       ..that K. a book with difficulty read can

d' ..dass Hans [ein Buch interessánt findet]  
 ..that H. a book interesting finds

This is in fact what the null theory predicts, as, in a left-branching constituent whose head is V, the constituent to its immediate left is in each case the most deeply embedded constituent of the VP:



This is true even if (25) is not a base generated configuration, but a derived one, with YP moved from a position between XP and V.

Note that in (26)a, the direct object, and in (26)b both the direct and the indirect object have been moved to the left via Scrambling, thus leaving the indirect object and the adverbial phrase, respectively, as the most deeply embedded constituent of the VP:

(26)a ..dass Bruno sein Geld [ oft Kíndern gab ]  
 ..that B. his money often to the children gave

b ..dass Bruno sein Geld den Kindern [ óft gab ]  
 ..that B. his money to the poor often gave

If so, the basic stress contour of the VP is predicted with no need for a special version of the Nuclear Stress Rule.

The same predictions follow a fortiori if the verb raises to INFL, as is now standardly assumed: 21

(27)a ..dass Bruno sein Geld [ oft Kíndern ] gab

b ..dass Bruno sein Geld den Armen [ óft ] gab

Next, consider APs (not discussed in Kiparsky 1966). They can take prepositional complements on both sides, and Case-marked NPs to their left only:

(28)a Er ist [ über seinen Freund ungehalten ]  
He is at his friend angry

b Er ist [ ungehalten über seinen Freund ]  
He is angry at his friend

(29)a Er war [ dem Mann böse ]  
He was to the man nasty

b \*Er war [ böse dem Mann ]  
He was nasty to the man

This is generally taken to indicate their head-final character (with the head-complement order derived via the independent rule of extraposition - cf. Giorgi and Longobardi (1991,chapter 3), Tappe (1990)):

(30)a Er ist [AP [A' [pp über seinen Freund] ungehalten ]]

b Er ist [AP [AP [A' t ungehalten ]]] [pp über seinen Freund]

If this were the case, the null theory of phrase stress would face a serious problem, as it would predict the strongest stress to fall in (28)a-(29)a on Freund and Mann, the most deeply embedded constituents, rather than on the adjective, as is instead the case.

Interestingly, there is evidence that more is involved; in particular that preadjectival complements in German cannot stay under A', but must move out of it, to adjoin at least to AP, whatever is their D-structure source (also see Webelhuth (1989,chapter 6)). The evidence comes from the following peculiarity of the word order internal to the AP: when the complement precedes the head and there is a lexical specifier or some other pre-head modifier, one finds the order complement-specifier-head rather than the order specifier-complement-head. See:

(31)a Er ist über seinen Freund sehr ungehalten

b \*Er ist sehr über seinen Freund ungehalten

(32)a Er war dem Mann sehr böse

b \*Er war sehr dem Mann böse

The fact that the complement must precede the specifier sehr 'very' is evidence that it cannot stay under A', but that it must adjoin at least to AP. As Henk van Riemsdijk pointed out (p.c.), there is in fact evidence that the complement must adjoin to some projection higher than AP even, as the complement must precede the negation (which is outside the AP and is in fact taken to mark the left boundary of VP - cf. Webelhuth 1990,55):

(33)a ..dass er dem Mann nicht [<sub>VP</sub> [<sub>AP</sub>böse] t<sub>i</sub>] war<sub>i</sub>  
..that he to the man not nasty was

b \*..dass er nicht [<sub>VP</sub> [<sub>AP</sub>dem Mann böse] t<sub>i</sub>] war<sub>i</sub>  
..that he not to the man nasty was

((33)b is - irrelevantly - possible if nicht and dem Mann form a constituent).

The case of German APs is methodologically instructive. It shows how careful one must be in putting a hypothesis to test. Insufficiently analysed structures may easily lead to incorrect conclusions concerning the hypothesis to test.

When the functional categories IP (or rather AGRP<sub>S</sub>, TP, AGRP<sub>O</sub> - Chomsky 1989) and CP are taken into account, a more complete picture of German sentence stress can be given.

German AGRP<sub>S</sub>, T and AGRP<sub>O</sub> take their complements to the left, while C takes AGRP<sub>S</sub> to its right (cf. Grewendorf 1988, den Besten 1989,274, among others):

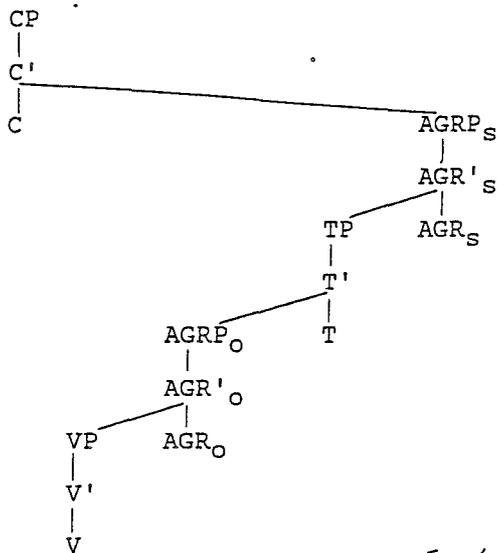


Fig. 4

In root clauses (and in embedded clauses selected by certain predicates - Bader and Penner 1990, Vikner 1990, Cinque 1989), the V raises to C, while a maximal projection must fill the SPEC of CP (in declaratives). In non V/2 subordinate clauses, instead, the finite V raises just to AGR<sub>S</sub> (cf. the references of fn.21).

This gives rise to a variety of different cases, all sharing the property that apparently the greatest prominence falls on the most deeply embedded (lexical) constituent, as predicted by the null theory. See (when not crucial, we conflate AGRP<sub>S</sub>, TP and AGRP<sub>O</sub> into IP): 22

(34)a [<sub>CP</sub> Waldemar<sub>i</sub> [<sub>C'</sub> spielt<sub>k</sub> [<sub>IP</sub> t<sub>i</sub> [<sub>VP</sub> Theater<sub>k</sub> ] t<sub>k</sub> ]]]

W. plays in the theater

b [<sub>CP</sub> Das Buch<sub>i</sub> [<sub>C'</sub> findet<sub>k</sub> [<sub>IP</sub> er [<sub>VP</sub> interessant<sub>k</sub> ] t<sub>k</sub> ]]]

The book he finds interesting

c [<sub>CP</sub> [Trinken wollen]<sub>i</sub> [<sub>C'</sub> wird [<sub>IP</sub> sie ihn nicht VP<sub>i</sub> ]]]

want to drink he will not

(35)a. [CP Hans<sub>i</sub> [C' hat<sub>k</sub> [ t<sub>i</sub> nie gelesen ] t<sub>k</sub>]]<sup>23</sup>.

H. has never read

b [CP Den<sub>i</sub> [C' hat<sub>k</sub> [ Hans [t<sub>i</sub> gelesén ] t<sub>k</sub>]]

That has H. read

(36)a Weil [IP Fritz [VP [NP viele Tórtén ] backen ] kann ]..

Because F. many pies bake can..

b Weil [IP Fritz [VP gut [V' kóchen ] ] kann ]..

Because F. well cook can..

Such contrasts as (37)a-b connected to the (in)definite character of the object (Kiparsky (1966,91f) fall into place if one assumes that only indefinite objects can remain in VP, definite ones being necessarily scrambled to some projection of INFL (perhaps, SPEC of AGRP<sub>0</sub>), as argued for on independent grounds by Brugger (1990) (Also see Moltmann's (1990) discussion):<sup>24</sup>

(37)a [CP Der Arzt [C' wird [AGP [VP einen Patientén untersuchen]]]]  
The doctor will visit a patient

b [CP Der Arzt [C' wird [AGRP den Patientén<sub>i</sub> [VP t<sub>i</sub> untersúchen]]]]  
The doctor will visit the patient

I close this section by briefly considering the position of a number of specifiers and other modifiers in relation to the positioning of stress.

In noun phrases with prenominal genitives and adjectives the main stress goes on the head N (Kiparsky 1966):

(38)a Peters Áuto 'P.'s car'

b Die dicke Émma 'The fat E.'

Recent work on the structure of the noun phrase indicates that its internal structure is more complex than previously assumed, with a

projection for the determiner and at least two functional projections intermediate between D and the NP (cf. Ritter (1990) and Cinque (1990) for evidence based on Hebrew and Romance, respectively). If prenominal adjectives are located in the SPEC position of these intermediate functional projections (possibly, of agreement - Cinque 1990), the head N will qualify as the most deeply embedded constituent, thus bearing primary stress according to the null theory (the case of prenominal genitives requires, instead, a refinement which will be discussed in section 7 below):

(39) [DP Die [FP [FP\* dicke F\* [NP [N' Emma ]]]]]

When a postnominal subject genitive or an adverbial modifier is present the main stress of the noun phrase is located on it:

(40)a Die Ankunft von Karl 'the arrival of John'  
 b Der Mann aus Rio 'the man from Rio'

This again follows from their being more deeply embedded than the head N under current assumptions (Giorgi and Longobardi 1991):

(41)a [DP Die [NP [N' Ankunft ] [pp [p' von [DP Karl ]]]]  
 b [DP Der [NP [N' Mann ] [pp [p' aus [DP Rio]]]]]

Similar considerations hold for adjectival and verbal specifiers ([AP sehr [A' böse ]] 'very nasty' ; [weil [IP er [vp gut [v' kochen ]] kann]] 'because he well cook can').<sup>25</sup>

No doubt, other aspects of German phrase and sentence structure would deserve attention. The cases so far reviewed, however, constitute some evidence for the null theory of phrase stress.

Dutch appears to provide analogous evidence, at least to judge from the inventory of Dutch phrase and sentence types given by Baart (1987, 83-103) with an indication of their unmarked, non contrastive,

stress.

In the next section, we turn to some of the questions hitherto ignored concerning the information structure of the sentence. Before that, a brief comparison may be worthwhile between the metrical grid theory which, as seen, permits the derivation of phrase stress from the word stresses and surface syntactic structure via asterisk addition to each phrase ( in conformity with certain general conditions), and the metrical tree theory. The formalism of the latter appears unable to derive the same result. This is because it is a purely interpretive procedure which marks the two branches of a binary structure weak (W) and strong (S) in relation to each other, and independently of the manner of its application (cyclic or not). Thus, it leaves no way to link the assignment of S to the most deeply embedded constituent. Even if assignment of S were to be somehow linked to depth of embedding, the link would not be principled. That is, it would not follow as a necessary consequence of the formalism, it seems.

This approach, if correct, also shows that at least certain phonological phenomena may be directly syntax driven, without recourse to prosodic theoretic notions such as phonological phrase or intonational phrase. Nespor and Vogel (1989, p. 10)

#### 6. The Focus and Presupposition Articulation of the Sentence

The study of phrase and sentence stress is not complete without considering the 'information' articulation of the sentence into Focus and Presupposition (Chomsky 1970), a distinction that recalls that found in other traditions between 'new' and 'old' information (Halliday 1967/68), 'rheme' and 'theme' (Firbas 1964 and references

cited there), or 'comment' and 'topic' (Chomsky 1965,221, Dahl 1969).<sup>26</sup>

Such distinctions pertain to discourse grammar in that they determine "the relation of the utterance to (...) utterances to which it is a possible response, and to other sentences in the discourse" (Chomsky 1970,205). For example, in the context of a question like (42)a, which introduces John in the discourse and shows ignorance of his actions, an appropriate answer will have John as part of the 'presupposition' (or 'old' information, or 'theme', or 'topic') and the VP as the focus (or 'new' information, or 'rheme', or 'comment'):

(42)a What did John do ?

b [ John ] [ left ]  
P F

Conversely, in (43)b, the answer to (43)a, John will be the focus and the VP the 'presupposition':

(43)a Who left ?

b [ John ] [ left ]  
F P

The absolute prominence of the sentence falls in both cases on the phrase which constitutes the focus, the VP left in (42), and the subject NP John in (43)b. Note that in either case no contrastive or emphatic stress is necessarily involved. For this reason the stress contour of (43)b has occasionally been taken to be an exception to Chomsky and Halle's Nuclear Stress Rule (cf. Schmerling 1976).

But this is not really so. One must distinguish the sentence grammar formal procedure which determines where the prominence of a phrase will be located (the Nuclear Stress Rule or the null alternative discussed above) from the discourse grammar procedure which determines

that the prominence of the phrase in focus will win out, in relative terms, over that of the 'presupposed' phrase.<sup>27</sup>

That the two procedures are indeed different, and have to be distinguished, is shown by the fact that the formal procedure is at work both in the phrase constituting the focus and in that constituting the presupposition, as we see from cases slightly more complex than (42) or (43):

(44) (Any news of John ?)

Well, [<sub>NP</sub>the poor f<sup>^</sup>ellow] [<sub>VP</sub>is in bed with a 'flu']

(45) (Who's giving him a hard time?)

[<sub>NP</sub>The candidate that he f<sup>^</sup>ailed] [<sub>VP</sub>is apparently giving him a hard t<sup>^</sup>ime ]

Both the presupposition (the NP in (44) and the VP in (45)), and the focus (the VP in (44) and the NP in (45)) have a detectable prominence, determined by the formal sentence grammar procedure, which applies blindly to each phrase.

The fact that in both cases the prominence of the phrase in focus will ultimately be higher than the prominence of the phrase constituting the presupposition is a different matter.<sup>28</sup>

In this light, the sentence grammar procedure of phrase stress assignment can be conceived of as a formal means for locating the main stress of a phrase (the most deeply embedded constituent under the null theory), and for marking the relative degree of prominence of the various stresses in the phrase (in terms of the respective number of asterisks in the metrical grid).

The discourse grammar procedure instead may be taken to impose the

requirement that the main stress of the phrase in focus be more prominent than the main stress of the presupposition (in absolute terms).

The well-known ambiguity in focus of a sentence like (46) (Chomsky 1970), where , as shown by the variety of answers in (47), any of the phrases indicated can be focus, is a direct consequence of the interplay of the two procedures:

(46) Was he [warned [to look out for [an ex-convict [with a red [SHIRT]]]]]]

(47)a No, he was warned to look out for an ex-convict with a red [TIE]

b No, he was warned to look out for an ex-convict [with a CARNATION]

c No, he was warned to look out for an [an AUTOMOBILE salesman]

d No, he was warned [ to expect a visit from the FBI ]

e No, he was [ simply told to be more CAUTIOUS ]

The ambiguity arises from the fact that the most prominent stress of a phrase will be located by the formal procedure on the most deeply embedded constituent of the phrase , and the fact that the noun shirt qualifies as the most deeply embedded constituent of all of the phrases indicated in (46), each one potentially qualifying as focus.<sup>29</sup> If the main stress were on red, the ambiguity would disappear, since that is the most deeply embedded constituent only of the dominating AP, not of the NP containing it, nor of any other more comprehensive phrase. So, main stress on red would be compatible only with the AP being in focus.

Depending on context, the most deeply embedded constituent of a focus

phrase (where the formal procedure would predict the main stress to fall) may happen to be 'old information', thus qualifying as part of the presupposition rather than of the focus. See:

(48)a I'd give the money to Mary, but I don't TRUST Mary (Schmerling 1976,59)

b Has John read Tristram Shandy? He doesn't READ novels.

In this case, the constituent is 'destressed', the main stress falling on the most deeply embedded constituent left in the phrase which qualifies as focus. Such destressing is possibly a consequence of the 'marginalization' of the presupposed constituent (Antinucci and Cinque 1977, Calabrese 1990), whereby this is removed from its base position and adjoined to some higher node, thus ceasing to be the most deeply embedded constituent of the phrase.

Certain elements, such as anaphoric pronouns and epithets, are inherently 'old information', so to speak; hence 'marginalized' ((49)a), unless specially contrasted ((49)b):

(49)a I'd give the money to JOHN, but I don't TRUST him/that bastard (Schmerling 1976,71)

b John insulted Mary, and then SHE insulted HIM (Lakoff 1968)

Other possibilities exist but the few remarks just made should be sufficient to justify the postulation of the two different procedures for stress assignment. Failure to distinguish them has led certain authors to deny the existence of a formal means to predict the location of the most prominent stress of a phrase based on structural principles.<sup>30</sup> But we have just seen that their conclusion is not warranted.

Their work, nonetheless, provides important insights on the not always easy task of determining what counts as focus in a certain discourse,

and in out-of-the-blue contexts.

Concerning the latter, for example, from Schmerling's (1976,41f) interesting discussion of the minimal pair of out-of-the-blue sentences in (50), one can surmise that determination of focus and presupposition may depend on knowledge of the world's events:

(50)a Truman DIED

b JOHNSON died

As Schmerling recalls, when (50)a was uttered Truman had been on the news media for some time because of his critical health conditions; so it was appropriate to consider him as part of the presupposition, while the news was the termination of his critical state.

Johnson, instead, died somewhat unexpectedly. He was not on people's mind as Truman had been; so it would have been inappropriate to take him as part of the presupposition.

Given that the entire event was new, one may wonder why (50)a could not have served as the unmarked stress pattern in this case too in which the entire CP is in focus. After all, V is more deeply embedded than the subject N, in the CP of (50)a, as it is dominated by its own projections plus at least the projections of T and AGR (Pollock 1989, Chomsky 1989, Belletti 1990).

An answer may come from a comparison with those languages, like Italian, in which the subject may remain in situ in its D-structure position. In Italian the sentences appropriate to the above contexts are (51) for (50)a, and (52)b for (50)b, not (52)a, the word-by-word translation of (50)b. Also cf. Dezsó (1982,118f) for Russian.

(51) Truman e' MORTO

(52)a (\*)JOHNSON e' morto

b E' morto JOHNSON

(52)b, as a report for a totally new event, is expected if the subject is in the D-structure object position. This is because it qualifies there as the most deeply embedded constituent of (the VP and ) the entire CP.<sup>31</sup>

The inappropriateness of (52)a in the same context would follow if a preverbal subject (in the SPEC of AGR) were necessarily part of the presupposition. This is in fact just what Guéron (1980) suggests on partly similar grounds. See, in particular, her distinction between predication sentences (like (50)a), in which the preverbal subject is presupposed, and presentation sentences (like (50)b), most common with verbs of appearance, in which "the subject is the (unmarked) Focus" (p.659). Also see Firbas (1964), Allerton and Cruttenden (1979), Culicover and Rochemont (1983,fn34), Faber (1987).

Given that no postverbal subject is possible in English (\*Died JOHNSON), the subject must move to the SPEC of AGR. This, however, would give rise to a predication sentence in which the subject is presupposed and the predicate is focus; an inappropriate state of affairs in such contexts where the entire event is new. The way out consists apparently in marking the least predictable element in the event (the subject) as focus while treating the predicate as presupposed (dying is one of the possible accidents that may occur to someone), in a kind of weighing of relative predictability.<sup>32</sup>

Other well-known minimal pairs, possibly susceptible of similar treatment via computation of relative predictability are (53)a-b or (54)a-b, from Bolinger (1972):

(53)a I have a POINT to make

b I have a point to EMPHASIZE

- (54)a The end of the chapter is reserved for various PROBLEMS to solve  
b The end of the chapter is reserved for various problems to  
COMPUTERIZE

Indeed, Bolinger notes: "In phrases like [...] work to do, clothes to wear, [...], the verb is highly predictable: [...] clothes are to wear, work is to do, [...]. Less predictable verbs are less likely to be de-accented. Where one has lessons to learn, one will probably have passages to memorize" (1972,633-634). For remarks along similar lines, see Berman and Szamosi (1972,312).<sup>33</sup>

In this context, the stress properties of a sentence like [[the author [of many popular articles [on the effects [of senescence]]] [[died]]], mentioned in section 4 as a potential difficulty for the null theory, ceases to be problematic. The most prominent stress will either fall on the subject (in which case it will be located on its most deeply embedded constituent senescence) or on the predicate (died) depending on which one of the two constitutes the focus position of the sentence. In this connection, also see the discussion at the end of section 7.

Other cases would deserve specific discussion. Many English stress patterns are still poorly understood or unanalysed, as are a number of crosslinguistic differences.<sup>34</sup> It seems, however, that, whatever the ultimate results will be, they should not affect the main point of this section, namely that a sentence grammar formal procedure of phrase stress assignment should be carefully distinguished from a discourse grammar procedure which privileges the main stress of the phrase in focus over the main stress of the phrase constituting the presupposition.

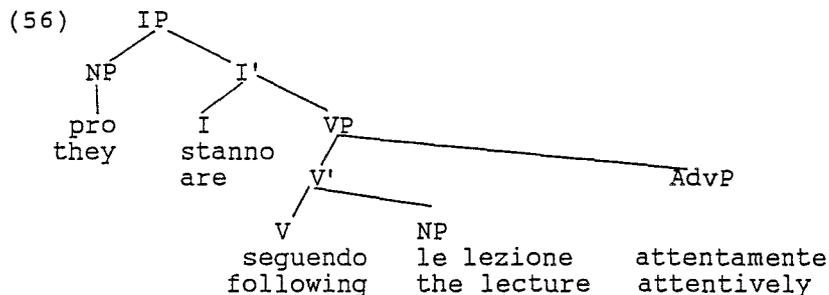
7. Some residual questions and a refinement

In this section I will firstly consider certain structures displaying a stress pattern that is at first sight problematic for the null theory. In each case, we shall see that alternative analyses exist in the literature, or appear to be plausible at a closer scrutiny, which are indeed compatible with the null theory. One residual class of cases will also point to a particular refinement of the system proposed above. Consider, to begin with, (55)a-b:

(55)a Loro stanno seguendo la lezione attentamente

b They are following the lecture attentively

In both Italian and English, the greatest prominence of the sentence is, under normal conditions, on the adverbial phrase (AdvP), the rightmost constituent. This is unexpected if the sentence structure is that shown in (56), the one assumed traditionally:

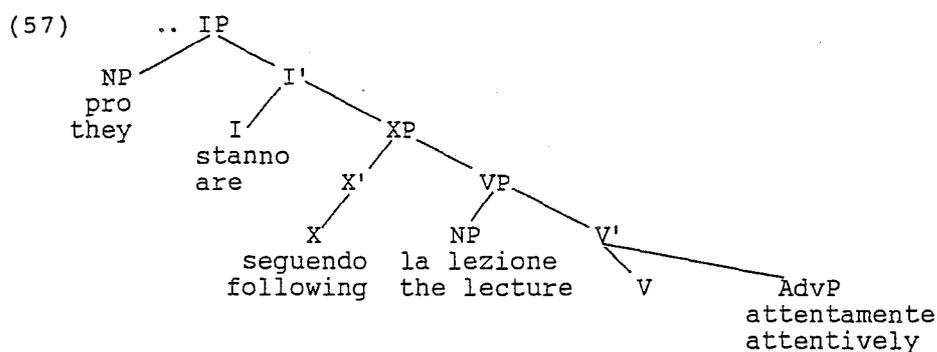


For, here, the object N is the most deeply embedded constituent (even abstracting from the extra DP projection) and consequently it, of all the VP constituents, should receive the greatest prominence. Given this structure, the only way for the AdvP to bear greatest prominence would be for it to be the only constituent in focus, with stanno seguendo la lezione/they are following the lecture constituting the presupposition (as is the case in the context of a question like How

are they following the lecture?). But this is not necessary, clearly. (55)b can be an answer to What are they doing?, with the entire VP as focus.

Fortunately, there is evidence that the traditional syntactic analysis of such cases is incorrect.

Larson (1988, fns. 11 and 49) and Stroik (1990), extending Barss and Lasnik's (1986) analysis, provide evidence that objects asymmetrically c-command VP adverbials (at least) at S-structure. Hence a more accurate representation of (55)a-b would be something like (57), where the AdvP indeed qualifies as the most deeply embedded constituent of the VP:<sup>35</sup>



If so, the unmarked stress pattern of (55) with main stress on the VP adverbial is precisely what the null theory predicts.<sup>36</sup>

Comparable evidence exists, as noted, that the first object of the double object construction in English (the 'dative') asymmetrically c-commands the second (cf. Barss and Lasnik (1986), and Kayne (1984) and Larson (1988)). So, the fact that the second object bears greatest prominence in the VP is expected under the null theory.<sup>37</sup>

Another potentially problematic case is represented by Heavy NP Shift. Consider the following alternations:

- (58)a Loro ricordarono l'appuntamento a Carlo  
 (lit.) They reminded the appointment to C.
- b Loro ricordarono a Carlo l'appuntamento (che gli avevano dato)  
 (lit.) They reminded to C. the appointment (that they had given  
 him)
- (59)a Gianni incontro' il figlio arrabbiato  
 G. met his son angry
- b Gianni incontro' arrabbiato il figlio  
 G. met angry his son
- (60)a Carlo parlo' a Maria di noi  
 C. spoke to M. about us
- b Carlo parlo' di noi a Maria  
 C. spoke about us to M.

In such cases too the greatest prominence is on the rightmost constituent, whatever that is.

This would follow once again from the null theory if we were to adopt Larson's (1988,1990) general approach, with its uniform rightward downward branching (".. elements appearing on the right [...] are typically lower in the phrase marker than elements to their left" - Larson 1990, 591); hence, we expect, will bear greater prominence.<sup>38</sup> For such cases, Larson suggests a rule of 'Light Predicate Raising', which moves the V + XP sequence, reanalysed as V, around the object. This particular analysis faces a problem in Romance, where finite Vs raise to AGR, across temporal and aspectual adverbs. These adverbs, unexpectedly, can separate the V from the XP, and moreover cannot intervene between the putatively reanalysed V + XP sequence and the heavy NP shifted object, again contrary to what one would expect:

- (61)a Maria non ricorda mai a Carlo gli appuntamenti di lavoro  
 (lit.) M. does not remind ever to C. business appointments
- b \*?Maria non ricorda a Carlo mai gli appuntamenti di lavoro

(62)a Gianni non incontra piu' arrabbiato il suo direttore  
G. does not meet anylonger angry his boss

b \*Gianni non incontra arrabbiato piu' il suo direttore

All this suggests that the V rises alone across such adverbs and cannot in fact be treated as part of a complex V including the XP.

If it is the case that the Heavy NP Shifted element must be the only constituent in focus (cf. Rochemont's (1978,33) term Focus NP Shift), then there is no problem for the null theory even if the NP is right adjoined to VP (hence is not the most embedded constituent). This is because, as noted, the main stress of the focus constituent is the most prominent stress.

A possible alternative, compatible with Larson's general approach, would be to assume a 'Light XP Shift', which adjoins the oblique complements (or adjuncts) leftward across the NP object, much as is generally assumed for German, which would thus look more similar to English and Italian, modulo the rightward raising of the V to AGR.<sup>39</sup>

It may be that such PP alternations as (60)a-b are not to be treated as cases of Heavy NP Shift (or Light XP Shift). Cf. Larson (1990), for discussion.

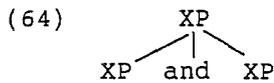
Another question is raised by coordinate structures. As is occasionally noted (Kiparsky 1966,82ff, among others), the last conjunct of a coordinated structure usually bears greatest prominence:

(63)a [<sub>2</sub> [ Kafkas Werke ] und [<sub>3</sub> [ die moderne Novelle ] ] ]

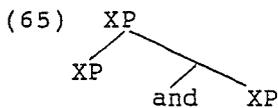
b [<sub>2</sub> [ Kafka's works ] and [<sub>3</sub> [ the modern short story ] ] ]

c [<sub>2</sub> [ Le opere di Kafka ] e [<sub>3</sub> [ la novella moderna ] ] ]

This is unexpected under the null theory if coordination is symmetric, as often assumed:



In this case too, there is, however, some evidence for an asymmetric representation of coordination in which the last conjunct is more deeply embedded than the others. Ross (1967,162-167) presents both syntactic and phonological evidence that the coordinating conjunction forms a constituent with the following conjunct, so that a more appropriate representation of (63) above would be (65) rather than (64) (also see Gazdar 1981,158):



Kayne's (1984) binary branching requirement for syntactic structures provides an additional conceptual reason to prefer (65) over (64). He has, in fact, explicitly argued (in Kayne 1983) that coordinating conjunctions should be treated as heads (in X-bar terms) of a maximal projection.<sup>40</sup>

If so, coordinate structures are entirely compatible with, and in fact support, the null theory of phrase stress.

Admittedly, other questions remain open that would deserve attention. Should the null theory resist at a wider and deeper scrutiny, then it would not be unreasonable to use it to question certain syntactic analyses that do not conform with its predictions.

There is still one class of facts that are apparently not reconcilable with the assumptions granted so far, and which point to a particular refinement of the present analysis. In the previous section we saw how the unexpectedly possible stress prominence of the predicate in a sentence like [the author [of many popular articles [ about the

effects [of senescence]]]] [died]] could be rendered compatible with the null theory by taking into consideration an independent dimension of the sentence: its articulation into focus and presupposition. The same account is not available, however, for the comparable situation found in NPs. Consider the following examples, pointed out by Richard Kayne and Morris Halle, respectively:

(66)a [The [man [from [Philadelphia]]]]'s há

b[Der [[von sieben [jungen [Italienern]]] entdeckte] ímpstoff]

The latter are not internally partitioned into a focussed and a presupposed part. Rather, they are usually themselves part of the focus or the presupposition of the sentence in which they appear.

Yet, in spite of the specifier's complexity, the main stress falls on the head.

It could be suggested that given the more articulated structure of the noun phrase, comprising at least two functional projections between DP and NP, and the fact that genitives rise to the SPEC of DP, the head would end up being more deeply embedded. But this appears dubious for the cases at hand, and more generally. For one thing, the most prominent stress falls on the head no matter how complex the specifier is:

(67) [[the [man [from [the apartment [ next to [ your sister's [former husband]]]]]]]]'s há

Secondly, and more significantly, in such cases as (66)a-b and (67) the articulated structure of the DP is replicated in the SPEC of the matrix DP, so that the genitive DP will contain in any case one layer more of embedding when it meets with the matrix D':

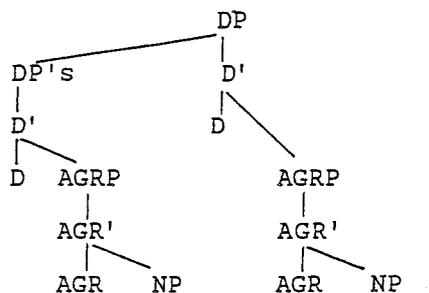


Fig. 5

All of this suggests the need to refine the procedure of grid construction utilized above (see (11)).

One way of drawing a principled distinction between heads and complements on one side and specifiers on the other would be to capitalize on how the property of 'recursion' (namely, the property of having a certain category dominated by a category of the same type, ad infinitum) is realized within a phrase.

It is well-known that the complement, not the specifier, introduces recursion, so that depending on the relative position of the complement and the head a language will be right recursive (say, Italian), or left recursive (say, Japanese).<sup>41</sup>

That there is a real asymmetry between the recursive and the non-recursive sides is shown by the fact that the side opposite to that of the complement has only limited, or selective, recursion, at least for the lexical phrases NP, AP, AdvP, VP and PP, as often noted (Cf. Zwarts (1974), Emonds (1976,19;1985,130ff), Williams (1982) and Longobardi (1991a,95-100)). The asymmetry in question can be roughly characterized as follows: when on the recursive side, recursion is possible both to the recursive or to the non-recursive side. When on the non-recursive side, recursion is possible only to the same non-

recursive side.<sup>42</sup>

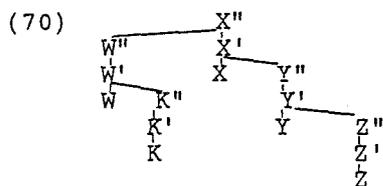
The latter property is exemplified by the following cases, simplified for convenience:

- (68)a He is a [<sub>NP</sub>proud (\*of his children) father]
- b He was [<sub>AP</sub>less (\*than us) sympathetic]
- c He walks [<sub>AdvP</sub>more (\*than us) rapidly]
- d He [<sub>VP</sub>specially (\*for us) made the cake]
- e The boat was [<sub>PP</sub>three miles (\*further than Sue's) off the coast]

As noted by Emonds and Longobardi, this restriction does not hold for (certain) functional projections, free right recursion being allowed in the specifier positions of CP, AGRP and DP. Cf.:

- (69)a On which day of the week are they coming?
- b The destruction of the documents was deliberate
- c The man from Philadelphia's hat

Now, according to the null theory, a consequence of the general principles of grid construction is that location of the main stress is simply a function of depth of embedding. Qualifying this notion, suppose we take it to involve consideration of the 'recursive side' of a phrase. This would limit the relevant notion of embedding to the continuous path uniting from the bottom all and only the nodes found on the recursive side and on the X' projection line of a phrase up to the node which is expanded on the non-recursive side. A simple example will illustrate this idea:



One path of embedding is that which unites Z to X" (Z,Z',Z",Y',Y",X',X"). It is a well-formed path since all the nodes which it connects are either on the X' axis (Z,Z',Z";Y',Y",X',X"), or expanded on the recursive side (now, assuming it to be fixed to the right). Another is the path uniting K to W". In this context, the path uniting K to X" is instead an ill-formed path of embedding as it contains at least one branch (W",X"), which is neither on the X' axis nor on the recursive side.

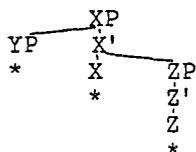
It is also possible to define the main path of embedding as that path which has the root of the constituent as one of its extremities (in (70), the path connecting Z to X").

Qualifying the notion of embedding this way, we obtain, as a consequence, that the somewhat exceptional free recursion of the specifier of CP,AGRP and DP be considered a separate path of embedding.

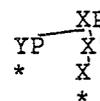
If so, it is not unreasonable to take the principles of grid construction to operate on it on a separate cycle. Assume, further, that when a 'peripheral' path of embedding joins the main path (i.e., when the minor cycle joins the main cycle), only the end result of the former is visible in terms of a single asterisk (much as happens in compound structure, as discussed in sect.9 below).

This implies that no matter how complex the specifier of CP,AGRP and DP, it will never win over a complement, or, in the absence of one, the head. Consider the simplified structures(71)a-b:<sup>43</sup>

(71)a



b



In (71)a, where the complement is present, the complement will prevail over the head (and the specifier) as its head will be the first to receive an asterisk (it being the most deeply embedded constituent on the main path of embedding).

When no complement is present, as in (71)b, the head of the phrase will qualify as the most deeply embedded constituent. Receiving an asterisk at the X' level, it will also attract the asterisk of the XP level, the internal structure of YP being 'invisible', as it were, at the level of the main cycle.

This refinement appears thus to have the correct empirical consequences for the stress contour of the apparently problematic cases (65)a-b above.<sup>44</sup>

This may also shed some light on the observation made in sect.5 above (after much tradition) that a sentence with a preverbal subject cannot count as a single focus constituent (as opposed to one with a postverbal subject in an unaccusative structure). Either the subject is focus and the predicate presupposition or viceversa.

In this frame, what prevents the entire sentence from counting as a single focus is the fact that it is made up of two distinct paths of embedding. The case of an unaccusative structure with an inverted subject in situ is instead different, as it is in fact made up of a single path of embedding

#### 8. Some typological evidence for the null theory

As seen, according to the null theory, a phrase's main stress is located on the phrase's most deeply embedded constituent. This is ordinarily the innermost complement of the phrase head; so, one

expects the location of the main stress to co-vary with the location of the innermost complement, as determined by the head-complement parameter. Thus, in a VP, it should be to the right of V in VO languages and to its left in OV languages.

As observed, one must be cautious, as this is one of a number of simplifications. In sect. 5, we noted, for example, that the D-structure innermost complement of a head can be moved higher up in the tree so that another constituent ends up as the most deeply embedded constituent, consequently receiving the main stress.

The responsible way to proceed in checking the correctness of the correlation would be to reach a perfect understanding of the S-structure constituency of the language, and then consider its stress patterns. A hardly feasible task.

This notwithstanding, it is possible to find in the literature some (at least) suggestive evidence going in the direction of what the null theory predicts.

Maling (1971) observes that a version of the Compound Rule (which gives prominence to the leftmost element of a constituent) "applies to all categories and nodes (except prepositional phrase)" in Old English (p.382), and that this appears to be connected to the verb-final nature of the language (p.382,fn.1).

McCawley (1977,273) notes that the Nuclear Stress Rules of English and Japanese are "mirror images" of each other ("the rule that the first accent in a constituent predominates is the Japanese analogue to the English 'nuclear stress rule' (Chomsky and Halle 1968), according to which the last accent in a constituent predominates"). Also see McCawley (1968). The correlation with the head-final character

of Japanese phrases (Kuno 1973) and the head-initial character of English phrases seems hardly accidental.

In a more comparative vein, Donegan and Stampe (1983,337), contrasting typologically the Munda family of languages with the Mon-Khmer family, make the important observation that phrase stress correlates with constituent order, to the effect that in the Munda languages, whose phrases are head-final ("operator-first", in their terminology), the phrase accent is phrase-initial (e.g. ['O V]), whereas in the Mon-Khmer languages, whose phrases are head-initial the phrase stress is phrase-final ([ V 'O]).

Similar general observations are also found in the more traditional typological literature, in particular in László Dezső's work on the typology of theme-rheme structure and sentence stress. Cf. Dezső (1974,1977,1982). Basing himself on data of Uralic, Altaic and some Indo-European languages, Dezső suggests that in SOV languages "the usual place of sentence stress and hence of rheme is the position immediately preceding the verb", whereas in SVO languages "the usual place of sentence stress is after the verb either in an immediately postverbal position or after an unstressed element" (1977,7). Also see Dezső(1982, 149f). Although in his theoretical framework sentence stress is determined by theme-rheme structure (and only indirectly by word order), in actual practice Dezső relates accentuation typology to word order directly; a revealing insight.

Dezső's results are confirmed and further extended in Kim's (1988) study, where Dezső's word order / stress correlation is found to obtain in other language families. The SOV languages examined there in which the unmarked focus (and sentence stress) falls in the position immediately preceding the V, are Telugu, Laccadive Malayalam and Tamil

of the Dravidian family, Dogri, Bengali, Gujarati and Hindi-Urdu of the Indo-European family,<sup>45</sup> Sherpa of the Sino-Tibetan family, Mongolian and Turkish of the Altaic family, and Japanese and Korean. For work along the same lines, devoted to mixed languages (Hungarian, German, etc.) also see Harlig and Bardovi-Harlig (1988). Another case of mixed language, apparently, is that of Afghan Persian as discussed in Bing (1980).

#### 9. On the Stress Pattern of Compounds

Since the dependence of compound stress on the internal constituency of the compound is even more striking (if anything) than that of phrases, it is tempting to try and extend the null hypothesis of phrase stress to compounds as well.

Ideally, one should be able to derive the stress pattern of compounds from the stresses of the component words, the internal constituent structure of the compound, and the metrical grid theory, without recourse to any language-specific rule.

As with the stress of phrases, any crosslinguistic difference should reflect the different structural relations in which the component words enter within the compound, possibly subject to parametric choices (cf. fn. 49 below).

In what follows, I will try to show that this appears to be possible for our three languages under a finer grained analysis of the constituent structure of compounds.

Should the analysis prove correct more generally, then no language-specific Compound Stress Rule would be needed anymore; undoubtedly, a desirable result.

In English two word compounds, the classical Compound Stress Rule "assigns primary stress to the first of the two peaks, reducing all other stress levels by one." (Chomsky and Halle (1968,92)).<sup>40</sup>

(1)a [[ ki<sup>4</sup>tchen ] [ to<sup>3</sup>wel ]]

b [[ to<sup>4</sup>wel ] [ ra<sup>3</sup>ck ]]

c [[ tea<sup>4</sup>chers ] [ u<sup>3</sup>nion ]]

More interesting is the case in which one of the two component words is itself a binary compound. See (73)a and b:

(73)a [[[ kitchen ] [ towel ]] [ rack ]]

b [[ kitchen ] [[ towel ] [ rack ]]]

Here, depending on the direction of branching ( leftbranching in (73a) and rightbranching in (73b)), the stress contour changes.<sup>47</sup>

In the first case, the most prominent stress falls on kitchen, the leftmost subcomponent of the leftmost element of the compound. In the second case, it falls on towel, the leftmost subcomponent of the rightmost element of the compound.

The stress pattern of (73a) requires no particular modification of the classical rule handling two word compounds. It follows from a cyclic application of the rule. In the innermost constituent, prominence is assigned to the leftmost peak kitchen, and in the outer constituent it is once again assigned to it, as kitchen also is the leftmost peak of the outer cycle.

Matters are not as simple with the stress pattern of (73b). Rightbranching compounds like (73b) require in Chomsky and Halle's

(1968,93) system a special qualification, and have called for some special statement in all treatments of compound stress thereafter.

In Liberman and Prince (1977), the iff clause of their Compound Stress Rule (8b), repeated here as (74), is motivated by just such cases:

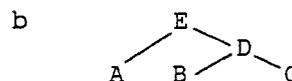
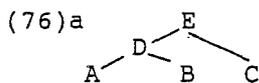
(74) In a configuration [<sub>C</sub> A B C], if C is a lexical category, B is strong iff it branches

In Halle (1985) and Halle and Vergnaud (1987), Liberman and Prince's iff clause is rephrased as a condition on the retraction of stress (our underlining):

(75) In a constituent C composed of two or more words, retract the right boundary of C to a position immediately before the head of C, provided that C is dominated by a lexical category and that the head of C is located in the last word of C

Although both (74) and (75) derive the correct stress pattern of (root) compounds, one cannot help wondering why the rule should contain those very conditions and not others. No principled reason appears to exclude that the condition for (74) be "iff A branches", or that of (75) "(provided) that the head of C is located in the penultimate word of C".

It seems that the correct theory of compound stress should derive as necessary the fact that the most prominent stress falls on A in the leftbranching structure (76)a, and on B in the rightbranching structure (76)b:



The null theory of phrase stress appears to have precisely these consequences under an analysis of the internal structure of compounds which modifies in part the standard analysis along lines which can be independently motivated.

The standard analysis recognizes for compounds the existence of a head (the rightmost constituent in English -Allen 1978, Williams 1981), and of a modifier, but takes the two constituents to be of equal bar level,  $X^0$  (the same level, in fact, as the compound itself):<sup>48</sup>

(77) [<sub>N</sub> [<sub>N</sub> towel ] [<sub>N</sub> rack ]]

Suppose, however, that Universal Grammar uniformly forbids such symmetric relations in the lexicon (in word-syntax), as it does in the syntax proper, by requiring that the relation between a head (the governor) and its complements or modifiers (the governees) be asymmetric, with the head an  $X^0$  category and its complements or modifiers XP categories (Stowell (1981), Muysken (1982), Chomsky (1986), Baker (1988)).

This amounts to saying that the head status of a constituent is singled out structurally rather than assigned by rule (as with the Righthand Head Rule of Williams (1981)).<sup>49</sup>

In this light, a more accurate representation of a compound such as towel rack would be as shown in (78):

(78) [<sub>N</sub> [<sub>NP</sub> towel ] [<sub>N</sub> rack ]]

This modification, prompted by conceptual considerations, also has an empirical payoff. As often noted in the literature, the modifier constituent of a compound can be phrasal (with certain restrictions):<sup>50</sup>

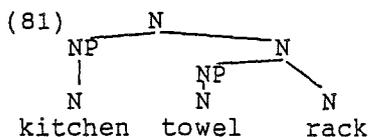
- (79)a a [[ ground to air ] [ missile ]]  
 b a [[ green vegetable(s) ] [ shelf ]]  
 c an [[ ate too much ] [ headache ]]  
 d an [[ over the fence ] [ gossip ]]  
 e [[ every day ] [ life ]]  
 f an [[ I turn the wheel of the universe ] [ air ]]

All such cases would be excluded if a word formation rule like (80) were assumed (as in Williams (1981), Toman (1982), Selkirk (1982)):

(80)  $X^0 \rightarrow [X^0 X^0 X^0]$

But if we have to admit a structure like  $[X^0 [Y^P] X^0]$  for at least some compounds, then uniformity considerations would suggest extending it to the simple case of towel rack as well (Also see Hoeksema (1988) for arguments that the modifier of a compound is a maximal projection).

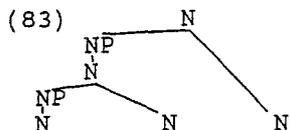
Although I introduce in a moment two further important refinements of the structure of compounds, this analysis, in interaction with the null theory of phrase stress, already proves able to derive the stress patterns of the basic left- and right-branching compounds (76)a and b as a necessary consequence. Consider how. In (81) below, equal to (73b) with labels added in conformity with the previous discussion (and ignoring intermediate bar levels), the most embedded constituent is towel, not kitchen; hence its more prominent stress. The corresponding metrical grid is given in (82):



(82)

	.	*	.	line 6						
(	.	*	)	line 5						
(	*	(	*	)	line 4					
(	(	*	)	(	*	)	line 3			
[	[	kitchen	]	[	[	towel	]	rack	]	]

Consider now (73a), with labels added :



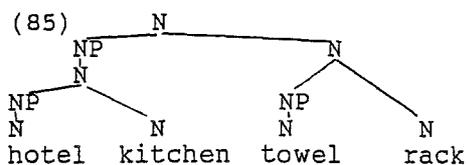
kitchen towel rack

Here, the most embedded constituent is kitchen. Hence it is this element which attracts more asterisks. Cf. the corresponding metrical grid (84):

(84)

	.	*	.	line 7							
(	.	*	)	line 6							
(	(	*	)	.	)	line 5					
(	(	(	*	)	)	)	line 4				
(	(	(	(	*	)	)	)	*	)	line 3	
[	[	[	[	kitchen	]	towel	]	]	]	rack	]

As it stands, the above analysis of compound structure raises one conceptual problem and, related to it, a more serious empirical problem, in connection with more complex cases such as (85) below, in which the most prominent stress is on the leftmost subcomponent of the rightmost constituent (towel), as in the more basic case (81):



This structure, and the procedure followed so far, would seem to predict an incorrect stress contour, as the most embedded constituent

appears to be the N hotel, not the N towel.

At an intuitive level, just as we would like to say that the topmost N counts as a line 3 (word) asterisk when the first syntactic cycle is reached, like any other non compound word (the hotel kitchen towel rack's size), we would like to say that the N hotel kitchen in (85), irrespective of the internal derivation of its stress, begins with a line 3 asterisk at the point where it combines with towel rack, so that (85) reduces in effect to the more basic (81) above.

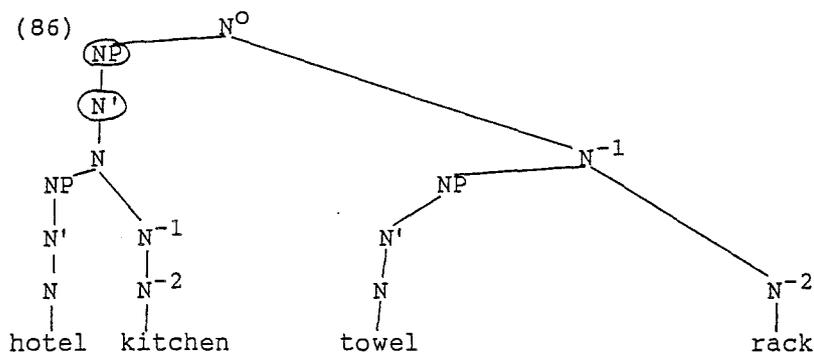
Even if right, this intuition runs into a technical problem if the structure of (85) is the one indicated. The reason is that also towel rack would count as a single line 3 asterisk when it combines with hotel kitchen, since it too is dominated by N in (85). We would thus get the wrong result once again, since the most prominent stress should now go on the modifier hotel kitchen (ultimately on hotel), as this is the more deeply embedded constituent of the two (being dominated by the extra node NP).

The discussion so far has, however, failed to note an important categorial difference between the two constituents hotel kitchen and towel rack. This difference suggests a way to begin to solve the conceptual problem and derive the correct empirical generalizations.

The key is in the notion 'head'. Suppose that the notion 'head' is one and the same in the lexicon and in the syntax, any apparent difference between the two being a function of the different level of representation in which it is employed.<sup>51</sup>

Within X'-theory, a head is such only in relation to a maximal phrase which it projects. For example, the N [hotel kitchen towel rack] is a syntactic head only if it projects to a NP (ultimately a DP) as in [a

[cheap [hotel kitchen towel rack ]]]. This means that if rack is the head of the compounds (81) and (83) (both compounds designate kinds of racks, locate any inflectional ending on rack, etc.), it will have to project to a maximal phrase, which in turn implies that the topmost N is maximal (lexiconwise) with respect to the N immediately dominating rack. Since the topmost N is an  $X^0$  syntaxwise, we can agree to express its maximality by noting lower level nodes on the lexical side with progressive negative integers (-1, -2,..). This gives (86) as a more accurate lexical representation of (85) above:<sup>52</sup>



Besides expressing in a more perspicuous way the notion 'head of a compound', this analysis gives the correct empirical results, in interaction with the hypothesis that hotel kitchen starts with one (line 3) asterisk at the topmost N cycle. Towel will receive the most prominent stress as it will collect one asterisk more than the higher modifier hotel kitchen, i.e. one at the N' level, one at the NP level, and one at the  $N^{-1}$  level (=3). Toy kitchen will instead receive two only, at the circled N' and NP levels, so that when the common  $N^0$  cycle is reached the final asterisk will be attracted in correspondence with the column over towel:

(87)

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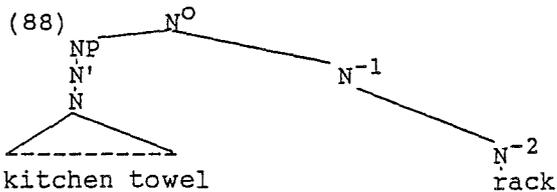
      .                               *                               .           line 7
(      .                               *                               .           line 6
(      *                               (      *                               ) ) line 5
( (      *                               ) ( (      *                               ) ) line 4
( ( (      *                               ) ) ( ( (      *                               ) ) ) line 3
[ [ [ [hotel kitchen ] ] ] ] [ [ [ [ towel ] ] ] ] [ rack ] ] ]

```

As indicated in (87), the fact that syntactic heads (Ns projecting a NP) count as single words, starting with one (line 3) asterisk, implies that the cyclic derivation which has derived the stress contour of hotel kitchen is 'invisible' in (87) (except for its end result in the form of a line 3 asterisk).

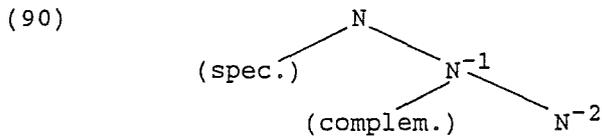
This implies that there will be a 'round' of stress assignment for each branching (compound) N. In (86), one at the N dominating hotel kitchen, responsible for the relative prominence of hotel over kitchen, and one at the matrix N, responsible for the relative prominence of towel over hotel kitchen (and rack).

The previous account of the stress pattern of left branching compounds ([[kitchen] [towel]] [rack]) must be slightly altered accordingly, but the outcome is unaffected by this refinement. Although [kitchen towel], as a syntactic head projecting a NP will merely count as one (line 3) asterisk located over the first syllabic nucleus of kitchen in the first round of stress assignment, it will nonetheless be more deeply embedded than the head rack, thus ultimately receiving the most prominent stress. See the structure (88), and the corresponding metrical grid (89):<sup>53</sup>



(89) .  
 ( \* . line 6  
 ( \* ) line 5  
 ( ( \* ) ) ( \* ) line 4  
 ( ( ( \* ) ) ) ( \* ) line 3  
 [ [ [ [ kitchen towel ] ] ] [ [ rack ] ] ]

There in fact appears to be evidence for a further refinement of the structure of compounds; one involving a more literal extension of X'-theory, which exactly parallels the one familiar in syntax. Under this interpretation, one must recognize a complement dominated by the first projection dominating the head and a specifier dominated by the maximal projection (modulo, in English, the different value of the head-complement parameter at the two levels):



So far, we have focussed on N N compounds in which prominence falls on the non-head, a very widespread (perhaps, the majority) pattern, but certainly not the only one. As documented in the literature there are many cases where the most prominent stress falls on the head.<sup>54</sup> Here are some representative cases (also see the examples in (79) above):

- (91) N N
- a kitchen <sup>/</sup>table
  - b town <sup>/</sup>hall
  - c woman <sup>/</sup>doctor
  - d police <sup>/</sup>investigation

The generalization which emerges from the three works cited in the last footnote (in fact, made explicit in Selkirk 1984) is that in N N compounds, as well as in other types of compounds, stress falls on the non-head if this is an argument of the head. Otherwise, it falls on

the head (cf. Selkirk 1984, 244ff).

This is particularly clear in N A compounds as shown by the following contrasts:

(92)a	fro <sup>ˈ</sup> st bitten	vs	b	lily whi <sup>ˈ</sup> te
	de <sup>ˈ</sup> sease prone			waist hi <sup>ˈ</sup> gh
	bloo <sup>ˈ</sup> d thirsty			dirt chea <sup>ˈ</sup> p
	ger <sup>ˈ</sup> m resistant			crystal clea <sup>ˈ</sup> r

As Selkirk puts it "what differentiates the (a) and the (b) cases, aside from the prominence patterns, is the semantic relation holding between the head and its sister. In [the (a) cases], the head has an argument to its left: bitten by frost, prone to disease, thirsty for blood, resistant to germs. In [the (b) cases], the head's sister has either the character of an adjunct modifier (e.g., as white as lily, as high as (the) waist, as cheap as dirt) or a locative force [..]" (Selkirk 1984, 245).

The same generalization is apparently at work in such well-known prominence contrasts in N N compounds as:<sup>55</sup>

(93)a	appre <sup>ˈ</sup> ntice welder	b	apprentice we <sup>ˈ</sup> lder
	to <sup>ˈ</sup> y factory		toy fáctory
	wi <sup>ˈ</sup> ne drinker		party drí <sup>ˈ</sup> inker

If the non-head is interpreted as a complement of the head as in (93)a ('one who welds apprentices', 'a factory producing toys',..), stress prominence falls on it. If it is interpreted as an adjunct/specifier ('a welder who is an apprentice', 'a factory which is a toy',..), stress prominence falls on the head. This conclusion is reinforced by an examination of the careful classification of stress prominences in compounds in Zwicky (1986). According to Zwicky's material, whenever

the non-head bears a possessive (government commission), locative (kitchen table, town hall), temporal (summer holiday), attributive (woman doctor), material (wood chest) relation to the head, i.e. a specifier relation to it, the non-head never bears main stress.

To take another example, this time from A A compounds, consider the contrast between (94)a and b (from Selkirk 1984,245ff; Bates 1988, 176ff):

(94)a	síck looking	b	good loóking
	níce seeming		hard híttíng
	stráñge sounding		long súfferring

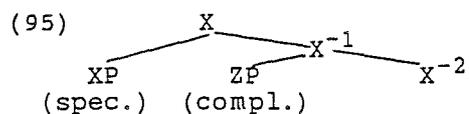
If the first adjective is interpreted as a complement of the following deverbal adjective ('he looks sick', 'he seems nice', 'it sounds strange', etc.), it bears main stress. If its interpretation is instead that of an adjunct, as in the b cases ('he looks well', 'he hits hard', 'he suffered for a long time', etc.), stress falls on the head, the deverbal adjective.

Of course, as Selkirk (1984,246) notes, work must be done to render the notion 'complement' relevant to compounds more precise. For example, it must be that the lefthand N in such cases as steel warehouse 'a warehouse for steel', towel rack 'a rack for towels', wheat flour 'flour (made) from wheat', coaltar product 'product (made) from coaltar' counts as a complement (bearing a goal, or source, theta-role) of the righthand N. What is relatively surer is that "when the lefthand element clearly has adjunct status (as a modifier, for example), the head is prominent and the adjunct may not be" (Selkirk, op.cit., p.247).<sup>56</sup>

Despite certain idealizations and open questions, Selkirk's insight is illuminating. It captures what appears to be the fundamental

generalization governing stress prominence within compounds (although there may also be lexical idiosyncracies).

Suppose, then, (in fact, departing from Selkirk's further conclusion that "the location of prominence [in compounds] cannot be explained in purely structural terms", p.245), that we assign a structural correlate to the semantic complement/adjunct distinction (just as we do in syntax).<sup>57</sup> In other words, suppose we assume that compounds are no different from phrases in the relevant respect, with complements generated as sisters of the head, and specifiers as daughters of the maximal projection as in (95):

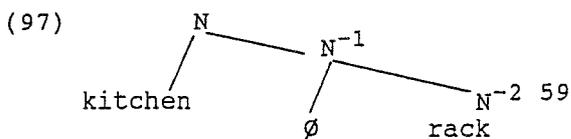
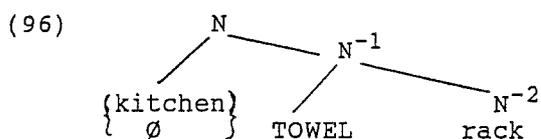


The analysis appears to derive as a necessary consequence a generalization about compound structure noted in Selkirk (1982, 36ff) and still in need of a principled explanation. In her words "all [non subject] arguments of the head of a compound must be satisfied within the compound immediately dominating the head". A compound like tree eater is ambiguous between a locative interpretation ('eater in a tree') and a theme interpretation ('eater of the tree'). But a compound like tree pasta eater is no more ambiguous, tree having only the locative interpretation, and a compound like pasta tree eater with the complement higher than the locative adjunct is impossible. This follows from imposing an X' structure to the compound as this forces internal arguments to be under X' (X<sup>-1</sup>) and non arguments to be in the specifier position under X" (X). Since pasta cannot receive a locative interpretation, it must occupy the complement position, closer to the head.<sup>58</sup>

The single structure (95), with the recursive possibility for ZP and YP to contain a head which is itself a compound, appears to subsume all the different possibilities discussed in the literature while bringing out the perfect identity of compounds and phrases in the pattern of stress prominence.

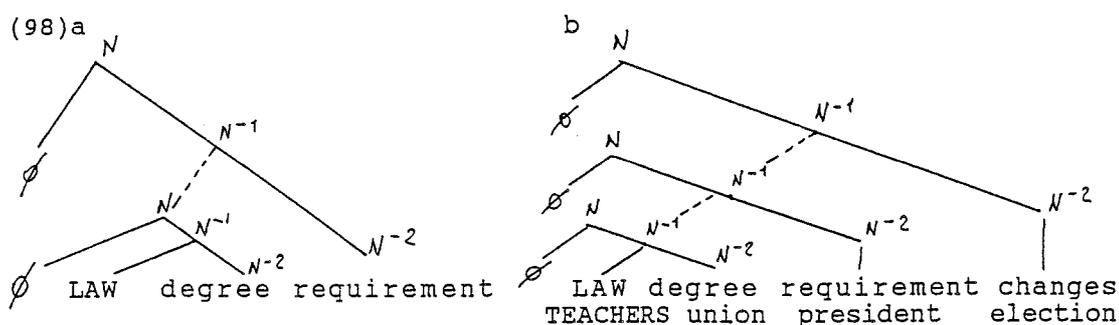
Recall the particular refinement of the principles of grid construction for phrases motivated at the end of sect.7, according to which only elements embedded on the recursive path are visible in their entirety for the principles of grid construction. The net effect of such a refinement was that a complement wins over the head (and the specifier) and, in the absence of a complement, the head wins over the specifier, with specifiers counting only as a single asterisk, due to their being on a non recursive branch.

We see that compounds are no exception to this generalization. In compounds too acomplement wins over the head (and the specifier) (cf.(96)), and, in the absence of a complement, the head wins (over the specifier), in this case giving righthand prominence (cf.(97)). This grounds Selkirk's generalization in purely structural terms, thus avoiding the problem noted above of a semantically based stress assignment:

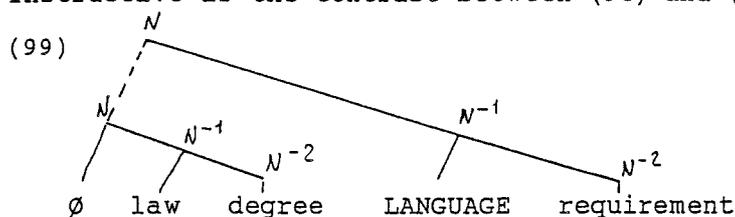


More complex cases are instantiations of the same single structure; with its recursivity potentials realized in different ways.

This can be seen by inspecting a few cases, some of which are already well-known from the literature (as above, the constituent receiving the most prominent stress is set in boldface. The dotted lines are meant to make conspicuous the fact that what is at stake in each case is a recursive expansion of either the complement or the specifier of the same basic structure):<sup>60</sup>



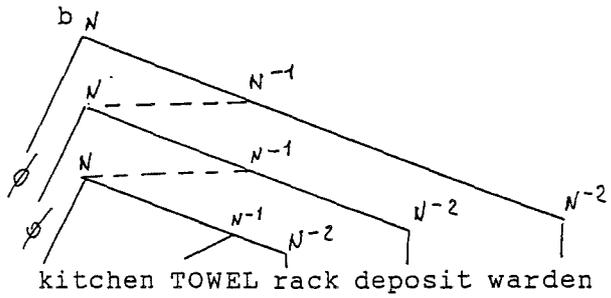
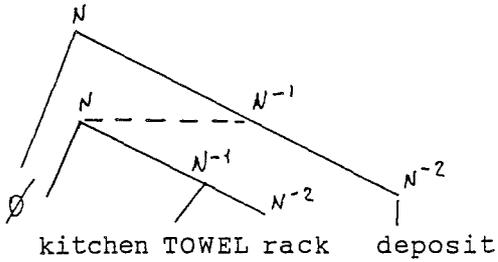
In (98)a and b each N appears to stand in a complement relation to the N to its right ('degree in law', 'requirement for (a degree in law)', 'changes of ..'). Hence the prominence on law, the most deeply embedded element of the compound in each case. Similar remarks hold for cases such as teachers union president election, and the like. Instructive is the contrast between (98) and (99):



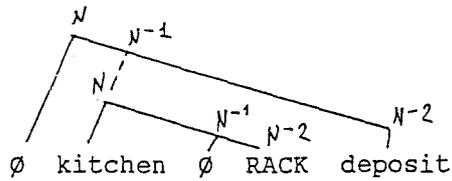
Here, law degree is not a complement of language, itself complement of requirement. So, it is no more part of the recursive path of

embedding, as it was in (98b). It can only be related to the head requirement in a more indirect way, as a specifier of language requirement. Consequently, it will be language which qualifies as the most embedded element of the compound and gets stress prominence.<sup>61</sup>

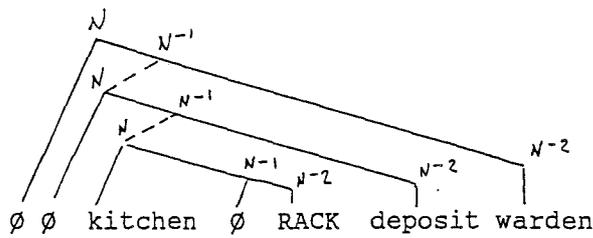
(100)a



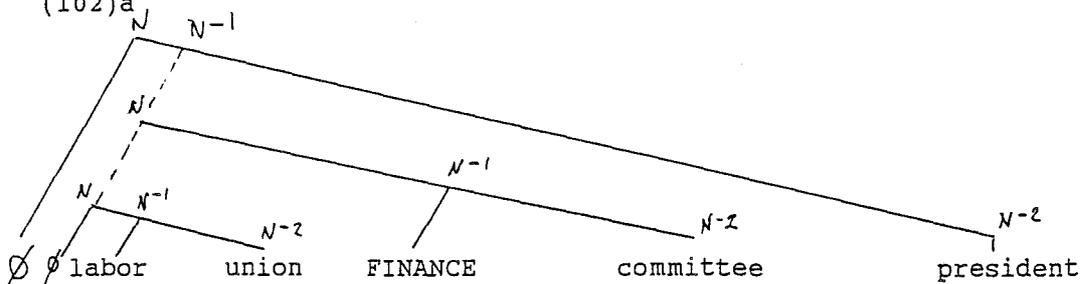
(101)a

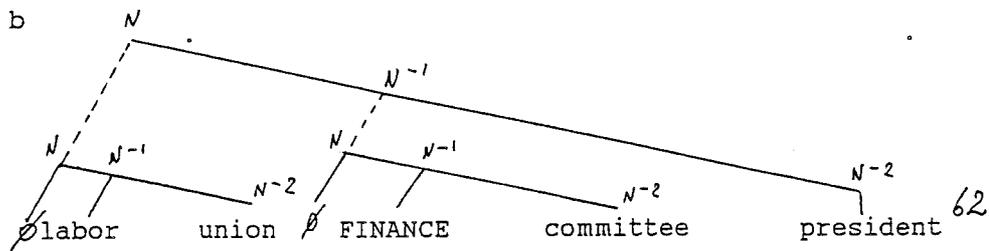


b



(102)a





A potential problem is provided by such A N compounds as (103) below, in which stress falls on the head even if the adjective apparently introduces a complement of the head:

- (103) lunar explor<sup>1</sup>ation (exploration of the moon)  
 stellar observ<sup>1</sup>ation (observation of the stars)  
 presidential elect<sup>1</sup>ion (election of the president)

If the adjective, as a consequence of that, were generated in the complement position of the compound, then it should receive stress prominence, but it doesn't.

Such cases as (103) differ from the cases discussed above, in which an adjective stood in a complement relation to a deverbal adjective and indeed received stress prominence within the compound (sick looking, etc.). But the two cases differ. In (103), for the adjective to stand in a proper complement relation to the N it would have to receive the theta-role theme from the N. We know, however, from the syntax of NPs, that adjectives cannot receive a theta-role by being generated in complement position, though they can in SPEC (cf. Kayne 1984, 63). If an analogous property holds for compound structure, then such adjectives will only be generable in the specifier position of the compound, and will possibly bear a general relation to the head similar to the R-relation holding between a genitive and the N in NPs. This appears indeed plausible given such cases as nuclear protest,

where the relation between nuclear and protest is more similar to an R-relation than to one of theta-role assignment.

In sum, if such adjectives are generated in the specifier rather than in the complement position, then expectedly stress prominence will go to the head. A(P)s would thus differ from N(P)s precisely in not being able to absorb a theta-role via government in complement position. It is interesting to note, then, that substituting a N(P) for the A(P) in (103), stress prominence changes systematically, in the expected way. (Bates 1988,80f):

- (104) <sup>/'</sup>cave exploration  
          <sup>/'</sup>star observation  
          <sup>/'</sup>officer election

In NN compounds, there is a class of cases in which the head receives stress prominence in the apparent presence of an argument. V. (105):

- (105) student <sup>/'</sup>rebellion  
          government <sup>/'</sup>funding  
          consumer <sup>/'</sup>spending  
          enemy <sup>/'</sup>movements  
          state <sup>/'</sup>hiring

At first sight the argument would seem to be an 'external' one (in Williams's (1981) sense), hence, if anything, generated in specifier rather than in complement position of the compound. It is however dubious that the non head Ns in (105) are genuine (external) arguments of the head. A genuine external argument cannot in general appear in the specifier position of compounds: \*girl swimming, \*kid eating - Selkirk (1982,34). Furthermore, as Bates (1988,111ff) notes, the head still retains the capability of assigning the external theta-role (a

student rebellion by Cambridge undergraduates). So, as he indeed suggests, the non head is interpreted more as a modifier ('typical of students') than as an argument.

In either case, at any rate, stress prominence is expected on the head.

In the present analysis, the stress contour of phrases and compounds is determined in one and the same way, and merely depends on constituent structure, above or below the word, according to the case. So, whenever two sequences of two (or more) words differ in stress contour, we are led to assign to them two different constituent structures, implausible as it may seem in certain cases as with such well-known pairs as apple cake (with stress on apple) and apple pie (with stress on pie).<sup>63</sup>

The present theory, in this case, must analyse the first with apple in complement position and the second with apple in specifier position:

(106)a



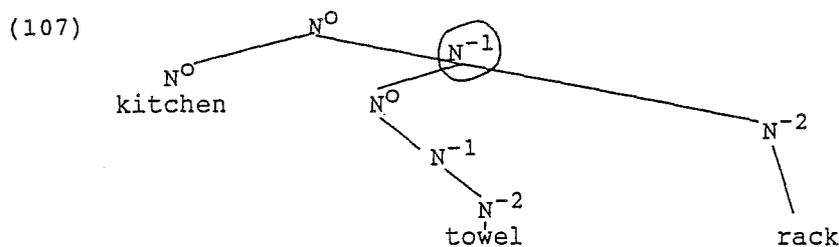
b



Possibly, even such contrasts as Madison Avenue vs. Madison Street differ structurally (pace Lieberman 1978, 165), though one should not exclude the possibility that there exist lexical idiosyncracies.<sup>64</sup>

Although we have assumed throughout that phrases can enter into compounds (both as specifiers and complements), our analysis does not crucially rest on this assumption, which is in any event controversial. While Sproat (1985), Waliska de Hackbeil (1986) argue for its correctness, others have questioned it (cf., among others, Selkirk (1982), Bates (1988)). A critical examination of this question is beyond the scope of this paper. We merely note here that the

correct compound stress patterns may follow from the metrical grid theory even if phrases are excluded from compounds. Ignoring specifiers, which, as noted, are computed on a different cycle, complements still count as more embedded than heads even if they are Ns rather than NPs. If the process of asterisk addition uniformly starts from  $N^{-2}$  for constituents found on the recursive path (complements and heads), complements will win, collecting an asterisk at  $N^{-1}$  and  $N^0$ , before the common cycle <sup>(the circled  $N^{-1}$ )</sup> is reached:<sup>65</sup>



Many questions concerning English compounds have not been addressed here, nor has the important question concerning parametrization, which deserves a separate treatment. Others have been addressed only briefly. I nevertheless hope that the present analysis was phrased clearly enough to suggest possible ways to solve the remaining issues.

Footnotes

\* For comments and suggestions to an earlier version of this article I am indebted to Werner Abraham, Josef Bayer, Paola Beninca', Gerhard Brugger, Andrea Calabrese, Anna Maria Di Sciullo, Guenther Grewendorf, Morris Halle, Richard Kayne, Michael Kenstowicz, Joan Mascaro, Marina Nespor, Petr Sgall.

1. By the same token, no language-specific Compound Stress Rule exists either if the null theory of phrase stress extends to compounds, as I indeed suggest in sect. 9 below.

2. Abstracting from a number of further choices and refinements required by some languages, such as whether the initial (or final) segment of the word is extrametrical; whether the heads of the constituents in a lower layer are 'predetermined' (e.g. all the vowels of closed or long syllables, as in Koya), or simply determined by the parameters and rules of constituent boundary construction (as in Maranungku); etc.

3. This condition on asterisk movement is nothing but Prince's (1983,33) "requirement that a column must have entries at every level up to its peak", which is instrumental in accounting for why stress retracts in antique chair (< antique chair) but not in antique dealer.  
As far as I can tell, it entails, though it is not equivalent to, Halle's (1985) Landing Site Constraint ("When an asterisk is moved it lands on the highest column of asterisks that is in its domain. If there is more than one such column it lands on the nearest of these"). This condition also appears to account for the curious exception to the Rhythm Rule noted in Halle and Vergnaud (1987,235,270) according



peculiar to this type of collocation, but not others and that stress shift applies to the base contour (thus giving the correct result within a restrictive theory of asterisk movement). The correct order results if the Rhythm Rule belongs to the cyclic stratum of the word-sequence phonology and the reduction rule to the noncyclic stratum.

5. Also note that constituents one of whose elements is a stressless word, such as a preposition or article, are systematically skipped (Halle and Vergnaud (1987,264)). In certain cases prepositions can be accented. Cf. Cruttenden and Faber (1991).

6. There being no upper bound on depth of embedding, no upper bound exists on the number of stress distinctions either. As speakers may "make fewer distinctions than are provided by this procedure", Halle and Vergnaud (1987) suggest a Grid Simplification Convention (cf. their p.266). On this question, also see Chomsky and Halle (1968,23).

7. Question (10)b in fact is not particular to Halle and Vergnaud's theory, but to any theory comprising (some version of) the Nuclear Stress Rule.

8. One may note, incidentally, that some of the parametric options which seem appropriate at the word stress level may in fact turn out to be irrelevant at the phrase stress level. So, for example, if Kayne's (1984) strict binary branching hypothesis is correct, as seems likely, the +BND parameter can be dispensed with, along with the +HT parameter.

9. (11)a differs from Halle and Vergnaud's (7)c in that it makes reference to constituenthood, irrespective of whether the constituent

contains only one or more than one stressed word (the most general interpretation, in any case). As will become clear, this simplification is crucial to obtain the correct results.

One may also note that this formulation is entirely consonant with the notion of head and projection discussed by Halle and Vergnaud themselves on pages 8 and 9.

10. Halle and Vergnaud (1987,265) claim that preached has more stress than people. If this is a clear and perceptible intuition, then the procedure in (11) will need to be amended. The corresponding facts of Italian seem to me not to be particularly sharp. Perhaps, "supplementary principles of prosodic realization" (Prince 1983,24) superimpose themselves on the effects of the present procedure. On rhythmic principles also see Selkirk (1984), Dell (1984).

11. See section 8 below.

12. The syntactic literature on German produced in the last decade is quite extensive, and a large consensus has now been reached on the fundamental structure of the German sentence (to be reviewed below). See, among others, Den Besten (1989), Thiersch (1982,1985), Grewendorf (1988,1989), and various papers in Abraham (1983,1985), Toman (1985), Haider and Prinzhorn (1986), and Grewendorf and Sternefeld (1990). Works on German phrase and sentence stress include Kiparsky (1966), Bierwisch (1966,1968), Loetscher (1981,1983), Bresson (1983). On the relation between stress and focus in German, also Fuchs (1976), Höhle (1982), Jacobs (1982), Selkirk (1984,225-230), Stechow and Uhlmann (1984,1985), Grewendorf (1989, chapter 4).

13. A similar approach is taken in Jacobs (1982).

14. (i)a-l represent (part of) the fragment of German grammar presupposed by Kiparsky:

- (i)a Satz --> (I) S
- b I -->  $\left\{ \begin{array}{c} W \\ \text{Imp} \end{array} \right\}$
- c S --> D VP
- d D --> Nom (Nom) (Nom) (Adv)
- e VP --> (Satz) Vb Aux
- f Vb --> (Adv) V
- g Nom --> d (Satz) N
- h Aux --> (Md) Fin
- i d --> determinant
- l Md --> modal verbs (sollen, wollen,..)

In addition to (i), Kiparsky, again following Bierwisch, assumes two rules applying to root clauses, one moving an arbitrary constituent to first position (corresponding to current XP movement to the SPEC of CP), and another moving the finite verb to second position (corresponding to current head-movement of V (to I) to C).

15. Cf. Drach (1940<sup>3</sup>). For recent critical comparisons of this tradition with current generative analyses of German, see Olsen (1982), Scherpenisse (1986, chapter 1), Grewendorf (1988,20), among others.

16. Phrased in other words, NPs, CPs and Ds would be subject to the (German analogue of the) Nuclear Stress Rule, while IPs and the verbal group 'VP' would be subject to a 'Reverse Nuclear Stress Rule', identical in effects to the English Compound Rule, modulo the word-

external vs. word-internal domain of application.

17. To remain neutral now between the numerical convention utilized by Kiparsky and the one used in Halle and Vergnaud (1987) and below, I use either a single, acute ('), accent for primary stress, or the convention of setting in boldface the constituent with primary stress.

18. It also faces certain empirical problems. So, for example, given that subjects are included in D and that D receives greater prominence in S (=D + 'VP'), the subject rather than the verb would be expected to bear primary stress in the following cases, contrary to fact:

- (i) Da hat das Kind mit gespielt  
With it the child has played

19. Further evidence in favor of the null theory may come from considering the general properties of the acquisition of German as a second language by English speakers. As noted in Schmerling (1976,84), if the stress contour of English and German phrases were determined by language-specific rules like the Nuclear Stress Rule, then one would expect that English speakers might have difficulties in learning the German version of the rule. Some speakers at least would commit errors such as that of stressing the verb rather than the object (weil ich Hans sah. 'because I saw H.'). But this seems never to happen (cf.p.117,fn6). "[O]nce the English speaker masters the correct order, the correct stress comes automatically"(p.84).

This is just what the null theory of phrase stress (which contemplates no language-specific rules) leads us to expect.

20. It also follows under Riemsdijk's (1990) interesting analysis of

post- and circumpositional PPs in German. According to this analysis lexical Ps are always head-initial, although their maximal projection is selected by a functional head-final head ( $[_{FP} [_{PP} P NP] F ]$ ). Postpositions then are prepositions raising to F, while circumpositions are cases of base generated Ps in both P and F.

For certain speakers, prepositions can apparently carry the most prominent stress when their object is pronominal (Komm mal zu mir 'Come to me' - Fuchs 1976,310), but not when they are stranded (cf. (i) of fn.18 above).

21. Cf. Giusti (1986,1990), Den Besten (1989), Webelhuth (1989), among others. Note that raising of the verb leaves a constituent essentially corresponding to Kiparsky's D constituent, which thus looks less ad hoc, retrospectively.

22. We abstract for the moment from such cases as Ein Brief kam an ('a letter arrived'), Otto kommt ('O. is coming'), which have primary stress on the subject (in the SPEC of CP) in the unmarked case (cf. Kiparsky 1966,89, Stechow and Uhmann 1984,253). A comprehension of such cases requires a discussion of the focus and presupposition articulation of the sentence, which we undertake in the next section. On the stress properties of separable prefixes in German see fn. 25 below.

23. For the apparently unexpected stress contour in (i), due to Josef Bayer (p.c.), I refer to the discussion in sect.7 below, where it is suggested that right branching structure on a left branch constitutes a separate cycle, 'invisible' to the main cycle:

- (i) Man hat den Mann<sub>i</sub> [ohne zu zögern] hingerichtet  
 One has the man without hesitating to death sentenced

24. The same conclusion is reached for Hindi in Mahajan (1991). The contrast reproduces itself with indefinite subjects, (which in German can remain within VP), but apparently not with indefinite indirect objects. See (i)a-b provided by G.Brugger (p.c.) and G.Grewendorf (p.c.), respectively:

- (i)a ..dass diesen Baum ein Förster fällte  
 ..that this tree a forester cut
- b ..dass diesen Baum der Förster fällte  
 ..that this tree the forester cut
- (ii)a ..dass das Buch dem studenten gehört  
 ..that the book to the student belongs
- b ..dass das Buch einem studenten gehört  
 ..that the book to a student belongs

Quantified NPs seem to go together with definite rather than indefinite objects, as G.Grewendorf (p.c.) pointed out:

- (iii) ..dass der Arzt bereitwillig jeden Patienten untersucht  
 ..that the doctor willingly every patient examined

25. A separate interesting case is provided by German 'separable (verb) prefixes', one of whose characteristics is to bear greater prominence than the verb (Helbig and Buscha 1984, Bresson 1983, vol.1, p. 562). Since they separate from the verb, they cannot be treated as being part of a complex lexical unity. A plausible analysis, which captures both properties, consists in analysing them as heads of intransitive PPs selected by the V (Riemsdijk's 1988):

- (i)a Wann werden wir [vp [pp [p<sub>an</sub>]] [v<sub>k</sub>kommen]] ?  
 When will we arrive?
- b Wann kommen wir [vp [pp [p<sub>an</sub>]] [v<sub>t</sub>]] ?  
 When do we arrive?

In this case, the 'prefix' would be more deeply embedded than the V in the VP (especially if this moves to INFL even in infinitival clauses -



29. Certain languages appear to be able to disambiguate cases like (46). In Polish, if the most deeply embedded constituent is stressed on the initial syllable rather than regularly on the penult, only that constituent may be focus. See the contrast between (i)a and b, from Dogil (1980,225f), who points out that only in the latter case can any of the phrases<sup>indicated</sup> be focus:

(i)a [waznosc [komunikacji [SAMochodowej]]]  
the importance of traveling by car

b [waznosc [komunikacji [samochoDowej]]]

30. Bolinger (1972), Schmerling (1976), Ladd (1980), to some extent, Bardovi-Harlig (1986), Bing (1979c), Erteschik-Shir and Lappin (1983), Gussenhoven (1984), among others.

31. Note that nothing changes even if proper names, as definite NPs, cannot remain in situ, but must rise to the postverbal VP subject position of transitive and unergative verbs (Belletti 1988) (see, however, the relative wellformedness of Ad un certo punto entro' Gianni dalla finestra 'At a certain point entered G. from the window', and Beninca' (1990) for evidence that proper names behave more like indefinite than definite NPs, hence can remain in situ).

This is because the V (whether finite or participial) moves out of VP, to the respective AGR position (Chomsky 1989, Belletti 1990), thus leaving the subject as the most deeply embedded constituent any way.

This can be seen with sentences containing unergative verbs denoting types of ordinary happenings. (i), for example, can be uttered in out-of-the-blue contexts where the entire event is new (not just Gianni):

(i) Ha telefonato GIANNI 'G. called'

(ii), instead, is possible only if Gianni alone is in focus and V plus

object is the presupposition:

(ii)a Ha telefonato a me GIANNI

b Ha telefonato la notizia IL NOSTRO CORRISPONDENTE

This is because the inverted subject, which is chomsky-adjoined to VP, in this case, is no more the most deeply embedded constituent. So it can receive primary stress only if it is the only element in focus (or is contrasted).

32. The focus/presupposition structure of intransitive sentences with unaccusative verbs in English appears to be preserved under embedding. See (i):

(i)a I just heard that Truman DIED

b I just heard that JOHNSON died

The impossibility in Italian of the word-by-word translation of JOHNSON died in the same context is presumably related to the existence of the less marked option (52)b. It is possible that such unmarked stress patterns as (ii), reported in Schmerling (1976,21f) should fall under the same generalization:

(ii)a There is a CAR coming

b I don't know what I'm going to do - I don't have any money and  
the RENT's due

c You left the WATER running

Interestingly, the corresponding Italian sentences cannot have the same contour, but rather have rightmost prominence (or inversion).

33. It is however not inconceivable that such contrasts have a structural basis. I leave the question open. (53)a is of the same type of cases, originally observed by Newman (1946), which led Bresnan (1971, 1972) to propose that the Nuclear Stress Rule applies at the

end of each syntactic (NP and S) cycle rather than on surface structure. Quite apart from the difficulty of translating some of Bresnan's assumptions in the present theory, her suggestion is not without empirical problems, as Lakoff (1972) and Berman and Szamosi (1972) pointed out. Bresnan (1972,332f) in fact acknowledges one such problem. Another problem is provided by the Italian facts discussed in the next footnote. For further critical discussion of Bresnan's proposal, see Schmerling (1976,88), Selkirk (1984,239ff).

All in all, it seems that there is no real motivation to abandon Chomsky and Halle's (1968,15) insight that "[stress] contours are determined in some manner by the surface structure of the utterance". Of course, what interferes is the discourse grammar procedure, sensitive to the focus and presupposition articulation of the sentence.

34. It appears, for example, that Italian differs systematically from English in generally not allowing primary stress in non final position (in non emphatic contexts). Many of Bresnan's contrasts appear thus to be neutralized in Italian. Cf. e.g.:

(i)a Ho istruzioni di PARTIRE 'I have instructions to LEAVE'

b Ho istruzioni da LASCIARE 'I have INSTRUCTIONS to leave'  
(also possible: Ho da lasciare ISTRUZIONI)

(ii)a John chiese che cosa Helen avesse SCRITTO  
J. asked what H. had WRITTEN

b John chiese quali libri Helen avesse SCRITTO  
J. asked WHAT BOOKS H. had written

(iii)a George ha trovato qualcuno che vorrebbe che tu INCONTRASSI  
G. found someone he'd like you to MEET

b George ha trovato degli amici che vorrebbe che tu INCONTRASSI  
G. found SOME FRIENDS he'd like you to meet

35. Stroik (1990) derives this particular c-command relation between

objects and VP adverbials on the basis of object -adverbial asymmetries such as the following (p.656):

(i)a Negative polarity

John saw noone anywhere vs. \*John saw anyone nowhere

b Superiority

Who did you see where? vs. \*Where did you see who?

c Bound pronouns

I saw everyone the day before he did vs. \*I see a man who plays  
on it every Xmas

etc.

A similar result would follow if the object moved necessarily to a higher position for Case reasons, followed by movement of the V, as in Sportiche (1990).

36. If speaker-oriented adverbs like probably, etc. are not under VP, but under some higher functional projection (cf. Belletti 1990), then the null theory predicts that they will not bear greatest prominence, even when rightmost in the sentence. A correct result. V.:

- (i)a Giorgio e' uscíto, probabilmente (vs. \*G. e' uscito probabilmente)  
b Giorgio léft, probably (vs. \*Giorgio left probably)

37. Larson (1988) argues that direct objects asymmetrically c-command prepositional objects, with the consequence that the latter will be more deeply embedded than the former (hence, we add, will bear greatest prominence). In this case, the same result would also seem to follow under the more traditional [<sub>VP</sub> [<sub>V'</sub> V NP ] [<sub>PP</sub> [NP ]]] structure, since prepositional objects are embedded under two nodes, P' and PP, while the direct object is only embedded under one, V'.

38. As R.Kayne noted (p.c.), the prediction is not always fulfilled, though. For example, particles, in some contexts, cannot bear the greatest prominence of the VP (and sentence), even if they are the rightmost constituent:

(i) John threw a book away

This cannot be due to their inability to bear main stress, as shown by the following cases:

(ii)a John threw it away

b What did John throw away?

Kayne (1985) provides evidence that these constructions involve a 'small clause' particle phrase, where the object is in fact the subject of an intransitive particle :

(iii) John [vp threw [partp [ a book] [part' [part<sup>away</sup>]]]

If this is so, the possibility arises of extending to these cases the focus/presupposition analysis of English intransitive clauses with verbs of 'appearance', discussed in fns.32, 34 and relative text. The systematic difference with Italian noted there is, suggestively, found here too: \*John ha buttato un libro via (unless un libro is contrasted) vs. John ha buttato via un libro.

Other cases where the rightmost constituent cannot bear the greatest prominence of the sentence are , as already noted, sentence final speaker-oriented adverbs (\*John left probably), and other types of adjuncts. The well-known ambiguity of John doesn't beat his wife because he loves her, where the adjunct can either be within the scope of the negation inside VP, or outside it, appears to correlate systematically with two different stress patterns, consistent with the null theory.

38. Note that the German VP is not a perfect mirror image of English and Italian VPs. As a matter of fact the three languages essentially show the same domain asymmetries, with direct objects higher than complement PPs, locative PPs and adverbials -cf., for German, Lenerz 1977). This is due to the fact that specifiers are on the left in the three languages. The only genuine asymmetry appears to be represented by the location of datives. These are higher than accusative objects in German, but lower in Italian and English (at least in the prepositional variant). A possibility is that German datives, which are bare NPs, are more like the first object of the English double object construction than of the English and Italian prepositional dative object. Though, it remains mysterious why datives in German cannot bind an anaphor found in the accusative object (Haider 1987):

- (i) \*Er hat den Gästen einander vorgestellt  
 He has the guests each other introduced  
 ↗  
 to

40. Similar claims are made in Munn (1987), Larson (1990, 595f), Collins (1988), cited by Larson.

41. We ignore now the case of mixed languages where the position of the complement w.r.t. the head is not the same for each phrase.

42. Emonds (1985) refers to this restriction as the "Recursion Restriction", Longobardi (1991b) as the "Consistency Principle". (Cf. also Zwart 1974, Emonds 1976, Williams 1982).  
 The notion of "recursive side" is Emonds's (1976, 19) ("A consequence of [this] surface restriction is that either all freely recursive phrase nodes [...] appear to the left of a given head of a phrase in surface structure, or else all appear to the right of the head. Thus it makes sense to speak of the "recursive side of (the head of) a

phrase" as that side of a head which exhibits the freely recursive nodes [...]).

43. This refinement of the null theory has both some points in common (in enhancing the role of complements) and some points of divergence (in allowing heads to win over specifiers) with Duanmu's (1990, chapter 4) notion of "non-head stress" ("whereby in a head-nonhead relation, the stress is assigned to the non-head", p.174). In the present system, the cases cited by Duanmu where a specifier appears to have more prominence than the head could perhaps be interpreted as compounds, as suggested by Selkirk (cf. Duanmu 1991).

44. The refinement just introduced appears to make the correct prediction for the stress contour of conjuncts under the X' analysis of coordination discussed above. According to that analysis, the conjunction is the head of an X' projection taking (as a first approximation) the two conjuncts as its specifier and head respectively ([XP [and XP]]). In head-initial languages, this will imply, then, that however complex the first conjunct is, the main stress will fall on the second, as the former is on the non recursive side. This appears indeed to be true:

(i) [[il primo [dei due autori [del libro [di poesie]]]] e [Mario]]  
The first of the two authors of the book of poems and M.

45. For a different picture of Bengali phrase stress, see, however, Hayes and Lahiri (1991, sect.3).

46. I assume here, as above, that 3 represents the highest degree of word stress.

47. The different direction of branching, which implies in one case

that kitchen and towel form a unit and in the other that towel and rack form a unit, correlates with a predictable semantic difference: "rack for kitchen towels" vs. "towel rack in the kitchen" (Cf. Chomsky and Halle (1968,93).

In this, and similar cases, syntactic (subword) structure mediates the correlation between stress patterns and semantic interpretations. We come back to this question later.

48. See for example Toman (1982), Silkirk (1982,1984), Di Sciullo and Williams (1987), among others. This is true of Chomsky and Halle's (1968) analysis as well, except for the fact that they also appear to admit cases like [N [NP ] N ], e.g. [N [NP American history] teacher], [N [NP black board ] eraser ] (p.21f).

49. This is not to say that William's insight (for compounds) is superfluous. One needs in any event to specify whether the structurally represented head is the rightmost or leftmost constituent of the compound , a matter of parametric choice, given that English and the Germanic languages in general locate it to the right whereas the Romance languages locate it to the left. For some discussion, see Giorgi and Longobardi (1991, chapter 3) and Di Sciullo (1991).

50. I have already mentioned Chomsky and Halle's (1968,22,fn9) [N [NP American history] teacher]. Also see Fabb (1984,136,145,190), Sproat (1985,199ff), Roeper (1988,205f), Hoeksema (1988,124ff), Lieber (1988), from which some of the examples in (79) are drawn, and Visch (1990, Appendix 1).

On the basis of the illformedness of cases like (i)a-b below, it is sometimes claimed that modifiers of compounds may be of category N'

(X', more generally), but never maximal projections (Fabb 1984, but see his p.143, and Sproat 1985,202ff). Within the DP hypothesis, (i)a-b do not warrant this conclusion anylonger. If "this suggests that a referential noun phrase may not occupy this in-compound position" (Fabb 1984,143) (also see Lieber (1988,206), Giorgi and Longobardi (1991,chapt. 3, sect. 4)), it could simply be that only the D projection is missing, owing to its role in the referential status of a noun phrase (Stowell (1989), Longobardi 1990), not the maximal projection NP, D's complement:

(i)a \*A [[the Bible] lover]                      b \*An [[every animal] eater]

51. In the spirit of Borer's (forthcoming) notion of Parallel morphology.

52. This recalls similar proposals made in the literature (cf. Selkirk (1982), among others), but differs from them in that  $N^{-1}$  and  $N^{-2}$  are not taken here as sub-word entities (e.g., 'stem'and 'root').  $N^{-2}$  and  $N^{-1}$  constitute, with  $N^0$ , the projection line of the compound head ( $N^{-2}$ ) which dominates a fullfledged word.

Alternatively, one could utilize the usual X' schema [ $N^n$  [ $N^i$   $N^0$ ]] and convene that in compound structure  $N^n$  counts as  $N^0$  in the next higher (compound or syntactic) cycle. For evidence that a more literal extension of X' theory to compounds is in order, hence that X' theory should perhaps be generalized across levels (word structure, compound structure, syntactic structure,..), see below.

53. One can imagine various interpretive algorithms which, from the metrical grids constructed at each round (cycle) compute the relative prominence of the constituents of the entire compound. Cf. the

discussion in Liberman and Prince (1977). Since not much is at stake here, I will leave open here the determination of the best such algorithm.

54. See, in the more recent literature, Selkirk (1984), Zwicky (1986), Bates (1988), and Booij and Dogil (1986) for Dutch examples.

55. Another possibility would consist in claiming that the b cases are not compounds but phrases, hence patterning in the expected way. This claim is occasionally made (cf. Bloomfield 1933,228), Bates (1984), among others), but it runs counter the evidence that they indeed behave like compounds, for example, in taking prefixes (an ex apprentice welder vs. \*an ex nice person. See Levi (1978), Zwicky (1986), and especially Bates (1988,chapter 3) for in-depth discussion. In any event, it does not seem possible to treat all collocations with 'afterstress' as phrases. As Zwicky (1986) points out, following Lees (1960), a sequence like legal document is ambiguous between the two readings: "a document which conforms to the law", and "a document employed within the context of the legal profession", where the first is a phrasal compositional reading and the second a compound reading. *Prominence is on document in both cases.*

56. The stress pattern of certain compounds appears to be indeterminate "within and among speakers" (Bates 1988, 177). Variation seems to exist in such cases as: slave built, hand washed, pan fried, hand <sup>d</sup>mae, etc. Perhaps, this is due to the possibility of analysing the lefthand member as either a complement ("built by slaves", "washed by hand",etc.) or an adjunct ("built with the help of slaves", "washed with hands",etc.). Cf.Zwicky (1986,55) for another case possibly interpretable in this manner.

57. There are reasons to reject an approach which institutes a direct link between the semantics of the compound and its stress pattern without having structure mediate between the two. For one thing, such an approach makes it arbitrary that complements rather than heads or specifiers should receive stress prominence. Nothing in principle would seem to exclude the opposite state of affairs from a semantic point of view. In the structural approach, instead, where the particular semantics of a compound is given a structural translation (as in the syntax) with complements more deeply embedded than heads and specifiers, the particular stress patterns that we find are forced by the null theory of stress assignment (the same which also works for syntactic phrases).

The structural approach also appears to constitute a plausible acquisition model. Semantic considerations via universal grammar single out particular structural representations, which in turn, again via universal grammar, determine stress properties.

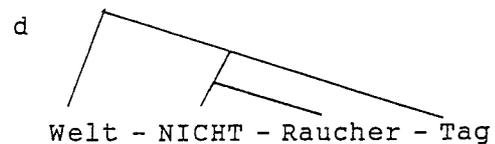
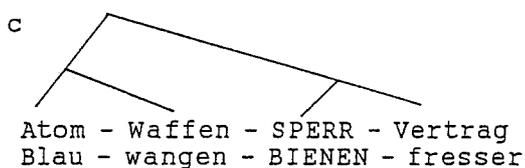
A second difficulty for a purely semantically based approach is represented by cross-linguistic differences. In this approach, presumably one would not expect parametric choices in the respective order of arguments and heads to affect the stress pattern of the compound, but they do. Cf. Engl. toy factory and its Italian equivalent fabbrica giocattolo (lit. factory toy) with the reverse stress pattern.

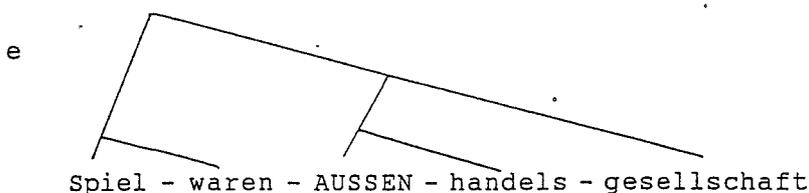
58. Selkirk (1982,37) also notes that "two [non subject] arguments cannot appear in a compound". So, one cannot have \*baby toy handing, \*table boot putting to render 'the handing of toys to babies', or 'the

putting of boots on the table'. This may follow again from a Larsonian X' structure with a single specifier and a single complement, if one assumes that an abstract head providing for the third argument is absent from compounds.

59. This analysis makes an interesting prediction in the case of kitchen rack. If the interpretation 'a rack for kitchens', comparable to 'a rack for towels', is possible over and above the 'locative' interpretation 'a rack which is in the kitchen', then kitchen should get prominence, as it comes to occupy the complement position. The prediction appears to be confirmed. See: In the bathroom, we have a KITCHEN rack.

60. Compound structure and compound stress in German is apparently the same as in English, expectedly, given the same head-final choice for the relevant parameter (Giorgi and Longobardi (1991, chapter 3)). See the following cases drawn from Giegerich (1981, 1983), and Grewendorf, Hamm and Sternefeld (1987, sect. 3.4) (also see Doleschal (1988) and references cited there). For similar facts in Dutch, cf. Langeweg (1987):

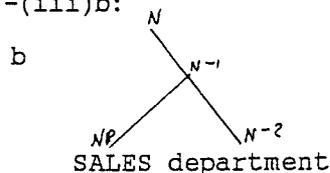
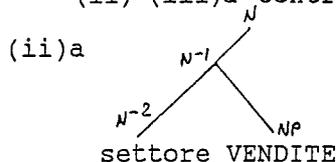


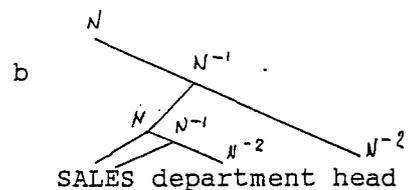
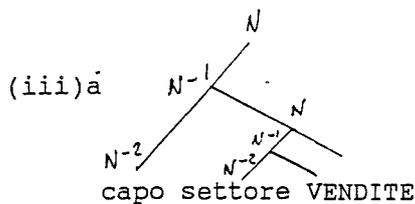


Certain apparent counterexamples (HAUPTbahnhof 'Central railway station', HALLENSchwimmbad 'covered swimming pool', or DreigROSCHENoper 'three pennies opera' vs. DREIfarbstift 'three color pencil'), are explained away if Bahnhof, Schwimmbad, etc. are single rather than compound words, and if Dreigroschenoper differs structurally from Dreifarbstift essentially in the same way that [N [NP [APblack] board ] eraser ] differs from [N [NP [Nblackboard]] eraser] (cf. Giegerich (1983)). J.Bayer points out (p.c.) that for him WELTspartag is also possible along WeltSPARTag, though WELTnichtrauchertag is not. Perhaps, spartag, though not nichtrauchertag can be optionally analysed as a single word.

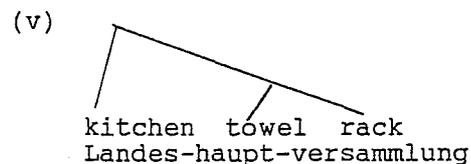
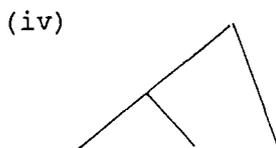
Given the head-initial order of Italian (more generally, Romance) compounds, we should expect a perfect mirror image. The expectation appears to be essentially right inasmuch as it possible to check it, given the severe limitations (in productivity, and perhaps type) on nominal compounding in Italian (for which see Zuffi 1981,17f and fn20, where it is pointed out that N-N compounds in Italian are generally coordinating rather than subordinating, and Giorgi and Longobardi 1991, chapter 3, sect.5, especially fn25). Thus, we have cases like

(ii)-(iii)a contrasting with English (ii)-(iii)b:





But it is not clear whether compounds with structure (iv), corresponding to structure (v) in Germanic, exist. No examples of that sort are found in Zuffi (1981).



Where (iv) would seem to be semantically appropriate, there are two main stresses, one on each modifier, separated by a pause: [[Tavola CALDA], PIZZERIA] '(lit.) hot table, pizzeria'.

61. This recalls Selkirk (1984,250) discussion (modulo the noted difference in approach): "In a compound configuration like [<sub>A</sub> [CD]<sub>A</sub> [<sub>B</sub>EF]<sub>B</sub>] it is impossible for A and B to stand in an argument-head relation to each other. (See Selkirk 1982:ch.2, where it is shown that a word with an open argument position -e.g. requirement- must have that argument satisfied by a sister constituent (if it is to be satisfied at all)- e.g. language. Since branching constituents like language requirement do not, on that theory, have open argument positions, it follows that the sister to a branching constituent will never be an argument with respect to it)".

62. Note that in (102)a and b, the most prominent stress goes on the middle constituent, although the two cases instantiate two different structures, and interpretations: (102)a = the president of the labor union's finance committee; (102)b = the finance committee's president

of the labor union.

Rather than in their contour, the two possibly differ in the location of (virtual) pauses, with a bigger pause between committee and president in (102)a and between union and finance in (102)b, much as in the ambiguous American history teacher (cf. Chomsky and Halle 1968,22,fn9). For a minimal pair in German similar to (102)a and (102)b, see Giegerich (1983,7 and fn.7), where the following two structures are assigned to Spielwarenaussenhandelsgesellschaft, with correspondingly different interpretations:

(i)a [[A B] [[C D] E]]                      b [[[A B] [C D]] E]

63. Zimmer (1971,C19), Schmerling (1971), Allen (1978,103ff) note that many such cases have in fact variable prominence:

(i)    apple pie                      apple pié  
      créam sauce                    cream saúce  
      chócolate cake                chocolate cáke

64. The other street names in English behave like Avenue, not Street. In German, apparently, all but Markt have stress on the first N (Ludwigweg, Béruggasse, Kárl Platz,.. vs. Hoher Márkt), but interestingly, if the first element of the compound is an adjective, stress may go on the head (Danziger Strásse). In Dutch, there is apparently great variability both among street names and in the uses of a single street name in different cities (I thank Gerhard Brugger and Jeannette Schaeffer for their information).

65. Whether syntactic or just compound 'phrases' are admitted, the asymmetric theory of coordination discussed in sect.7 makes the prediction that stress should fall on the second of the two members of

a stressed element of a compound. A correct prediction: salt and pepper shaker (see Bates (1988,213ff) for an interesting discussion of coordination within compounds).

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**Cecilia Poletto**

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THE DIACHRONIC DEVELOPMENT OF SUBJECT CLITICS IN NORTH EASTERN  
ITALIAN DIALECTS

1.1 INTRODUCTION

The aim of this paper is to provide some insight into the evolution of subject clitics of Northern Italian Dialects from the Renaissance period to the present stage. It will be shown that subject clitics are strictly related to the head of the Agreement projection. In particular it will be argued that subject clitics have been reanalyzed as heads that take on functions normally related to the Agr head in Standard Italian. From a relatively homogeneous stage Northern Italian Dialects have developed different systems in which subject clitics have specialized as the pro drop licenser head, or the Nominative Case assigning element, or can even occupy an additional Agr head. In section 2.1 and 2.2, the Renaissance Veneto dialects will be shown to be exactly parallel to Renaissance French, both in the treatment of subject clitics as well as subject DPs and in the pro drop system which is activated by the presence of a "strong" Agr or C head, (where strong is defined as carrying a particular grammatical feature). Section 2.3 deals with the Veneto dialect of the Sixteenth century which presents the system of a full pro drop language in which subject clitics are specified as pro licenser heads. Subject clitics can specialize not only as pro drop licensers, but as nominative Case assigners also, as is the Case for modern Trentino in section 3.1.

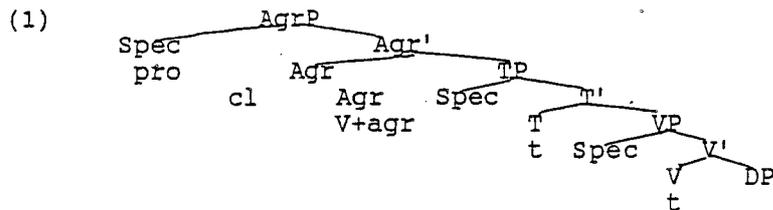
In the last two sections it will be shown that the spectrum of the functions played by subject clitics can be even wider: a special series of subject clitics will be shown to appear only with auxiliaries, in order to lexicalize a higher Agreement projection available only to auxiliaries as verbs that do not assign theta roles. The most advanced variety, namely Friulano, shows a very widespread use of subject clitics which signal the presence of another Agreement head that attracts clitics.

Northern Italian dialects seem to have reanalyzed subject clitics as a competing head that replaces some of the Agreement syntactic functions. The analysis of this phenomenon can thus help us to define the mechanisms that are involved in the syntactic mapping of the relation between a subject and its predicate.

#### 1.2 SUBJECT CLITICS AS HEADS

Subject clitics of the Northern Italian Dialects (cfr. Brandi & Cordin (1989) and Rizzi (1986)) are considered in the literature as the realization of morphological agreement features placed under the head of the syntactic Infl node, and not as true subject DPs which appear in the Spec of IP. On the contrary French subject clitics are considered to be in the same position of subject DPs.

Adopting Belletti's (1990) hypothesis about the order of the functional projections, this analysis of subject clitics can be rewritten as in (1) where subject clitics appear in an adjunct position to the head of AgrP:



In (1) the head of AgrP assigns nominative Case to the subject, which is placed in its Specifier position. This is the position in which a null subject is licensed in Standard Italian. Northern Italian Dialects (from now on NIDs) are pro drop languages just as Standard Italian is. In (1) infact a pro is licensed in the SpecAgr position.

Nevertheless the Agreement structure of NIDs is more complex: a subject clitic appears adjoined to the head of AgrP, where the verb has moved from the V position through T in order to incorporate the tense and agreement morphemes placed respectively under T and Agr. <fn.1>

We will briefly review the arguments used by Rizzi (1986) and reported by Brandi and Cordin (1989) in order to show that subject clitics of the NIDs are heads, because these tests will be important for the following discussion about their development from the Renaissance period to their present status.

Subject clitics are considered to be heads because they appear to the right of the preverbal negative marker, while subject DPs and French subject clitics appear on the left:

(2) To mama no vien  
Your mother not comes

(3) Elle ne vient pas  
She not comes not

- (4) No la vien  
Not she comes

As the position of NIDs subject clitics is to the right of the preverbal negation marker, while subject DPs (and French subject clitics) appear on its left, (cfr. (2)-(4)), we cannot assume that NIDs subject clitics occupy the same position that DPs fill at S-structure. <fn.2> Another test that reveals the status of NIDs subject clitics as heads adjoined to Agr is Agr' coordination. It is a fact that NIDs subject clitics have to be repeated in coordinate structures, while subject DPs and French subject clitics can be omitted in the second conjunct of the coordination:

- (5) Nane lese el giornale e \_ fuma un toscan  
John reads the newspaper and smokes a cigar
- (6) Il lit le journal et \_ fume un cigare  
He reads the newspaper and smokes a cigar
- (7) El lese el giornale e \*(el) fuma un toscan  
He reads the newspaper and \*(he) smokes a cigar

In (5) the subject DP Nane can be omitted in the second member of the coordination, the same is possible for French subject clitics as (6) shows, but in NIDs this is excluded. In (7) in fact, the sentence is grammatical only if the subject clitic is repeated. This contrast can be explained only accepting that the subject clitics in the NIDs are structurally closer to the inflected verb than a normal subject DP, and precisely that subject clitics occupy a position under Agr', while subject DPs occupy the SpecAgr position. This hypothesis can be expressed in syntactic terms as adjunction to the head of Agr as in (1). According to Belletti (1990), the inflected verb moves up to the Agr head position in order to incorporate the agreement morpheme. As (1)

shows, the subject clitics is adjoined to this head and this explains the reason why subject clitics cannot be separated from the inflected verb by any other element than other clitics.

In the dialects studied by Rizzi and Brandi & Cordin the subject clitic is always obligatorily expressed, even if a subject DP is present:

(8) La Maria la magna  
The Mary she eats

(9) \*La Maria magna  
The Mary eats

Also the contrast between (8) and (9) ( that corresponds to Brandi and Cordin ()) suggests that the subject clitic is not a true subject but a sort of morphological specification that is always expressed on the head of Agreement, independently of the element that is realized in SpecAgr which can be a null subject or a phonetically realized DP. (cfr. footnote for variables)

In order to avoid the possibility of interpreting (8) as an instance of left dislocation of the subject DP, Rizzi observes that the subject clitic is obligatory even when the subject DP is a Quantifier phrase, which cannot be left dislocated: <fn.3>

(10) Tut \*(l)'e` capita` de not  
Everything it is happened by night

(11) Tout (\*il) s'est passe' dans la nuit

While the trentino data in (10), the subject clitic has to cooccur with a quantifier subject, this is not possible in the French example (11).

Subject clitics of the NIDs are thus a part of the agreement morphology and not true subject pronouns. NIDs correlate

typologically with French, because they have subject clitics, but their structure is similar to Standard Italian because they are pro drop languages. This assumption also explains why the series of subject clitics is not complete for all persons in most NIDs, while it is complete in French, where subject clitics behave as subject DPs with respect to the tests presented here.

A closer examination of the distribution of subject clitics in other NIDs shows that not all subject clitics have the distribution described by Rizzi (1986) and by Brandi and Cordin (1989).

In particular, the tests in (4) and (7) are valid also for the subject clitics of Veneto that we will examine here, suggesting that they are all heads. On the contrary, the distribution of subject clitics can vary with respect to a subject DP. Not all subject clitics can appear when there is a phonetically realized subject DP in the sentence. As proposed in Poletto (1991a), I will assume that subject clitics in NIDs can be distinguished on the basis of a movement versus base-generation analysis.

As proposed by many authors ( cfr. in particular Koopman and Sportiche (1988)) I will assume that the subject is generated inside the VP, and precisely in the SpecVP position, where it gets its theta role assigned and it is raised successively to SpecAgr. in order to get nominative Case. I will refer to this subject position inside the VP as the basic argumental subject position. When a subject clitic is generated in the basic argumental position inside the VP, it gets the subject theta role, which is assigned in that position and then moves to Agr. No other subject can occur in this structure because the basic

subject position is occupied by the trace of the subject clitic. If the subject clitic on the contrary is base generated in its surface position in Agr, it is an expletive, deprived of the subject theta role. The subject theta role is in fact assigned into the lower position in the sentence structure inside the VP. As the basic subject position inside the VP is empty, it can be filled by another DP which absorbs the subject theta role. So, subject clitics that are generated inside the VP and then moved to Agr, can receive the subject theta role and are argumental clitics, while subject clitics base generated in Agr are expletive elements, as they do not have any theta role. The tests that permit us to distinguish between argumental versus expletive clitics are the following:

- (12)a No l'ha parla' nisuni  
 Not cl speaks anyone
- b \*Nol parla nisuni  
 Not+cl speaks anyone

In (12a) the subject clitic can cooccur with a subject DP which is realized in the postverbal subject position, while the clitic in (12b) cannot. <fn.4> So the subject clitics described in (10) for Trentino can be assimilated to the expletive clitic in (12a) because they are compatible with a subject DP in argumental position.

Subject clitics of the type of e<sub>i</sub> cannot appear if the subject DP has been moved through wh movement (as for instance restrictive relatives, topicalization or clefting), while subject clitics of the type i can: <fn.5>

- (13)a El puteo che (\*el) vien vanti...  
The boy that (\*he) comes along
- b Ti che \*(te) vien vanti  
You that \*(you) come along
- (14)a NANE, che (\*el) vien vanti...  
JOHN, that (\*he) comes along
- b TI, che \*(te) vien vanti  
YOU, that \*(you) come along
- (15)a Ze Nane, che (\*el) vien vanti  
Is John, that (\*he) comes along
- b Te si TI, che \*(te) vien vanti  
You is YOU. that \*(you) come along

(13), (14) and (15) represent respectively cases of restrictive relative clause, topicalization and clefting. In all these cases the third person subject clitic cannot cooccur with the variable trace, while the second person singular subject clitic can (indeed it must).

The explanation for the contrasts in (12), (13), (14) and (15) is that, as mentioned above, argumental subject clitics leave a trace in the basic subject position through which the subject theta role is transmitted. Hence they cannot cooccur with another subject, which would occupy the position of the trace.

Non-argumental subject clitics on the contrary are base generated in their superficial position, leaving the basic position free for another subject, which is the QP nisuni in (12) and the variable trace of wh movement in (13b), (14b) and (15b).

Some dialects have both expletive and argumental clitics; the Veneto variety that we used for the examples above is just such a one. Other varieties realize only one of the two possibilities.

From a diachronic point of view, it is interesting to investigate

how subject clitics of the NIDs have developed to reach their present status. Have they always been heads like today, or were they similar to French in some previous stages of evolution? Renzi (1989) has shown that Fiorentino of the XVIII century was like modern Standard French with respect to the distribution of subject clitics. If this is true, the same could be valid for North Eastern Italian dialects too, in particular for Veneto (cfr. Vanelli (1987)). In the following section the tests presented here will be applied to Veneto of the Renaissance in order to determine which syntactic status subject clitics have in this period.

#### 2.1 THE VENETO VARIETY IN THE RENAISSANCE

The subject clitic system of Veneto of the fifteen century was complete for all persons as the schema in (16) illustrates:  
<fn.6>

(16)	1.	2.	3.	1pl.	2pl.	3pl.	espl.
	a/e	te/ti	m. el f. la	a/e	a/e	m. i f. le	l

As Vanelli (1987) notes, these subject clitics do not present any of the features that induced Rizzi and Brandi & Cordin to characterize subject clitics as heads and not as maximal projections. In other words the position of subject clitics of Renaissance Veneto (from now on RVe) does not correspond to (1): subject clitics do not form a cluster with the inflected verb within the head of AgrP. They seem to behave as true subject DPs as modern French subject clitics do. In fact they can be left out in a conjoined structure and never appear after the negative marker (cfr. section 1.2):

- (17) El m'ha lago' le cavale (...) e si \_ ando' in la'  
 He to me has left the mares and so \_ went away  
 (Ruzante p.78)
- (18)a E no poteva tior.. (Calmo p. 66)  
 I not could take..
- b Che te no vissi ma` (Ruzante p. 91)  
 That you not see never
- c La no vaga a mio conto (Calmo p.79)  
 She not goes on my count
- d El no puol eser altrimenti ca benedeto (Calmo p. 94)<fn.7>  
 He not can be other than blessed
- e E no se inganemo (Calmo p. 66)  
 We not ourself mistake
- f Ch'un passo i non fare` (Ruzante p. 74)  
 That a step they no make (+future)

(17) and (18) show that subject clitics of this period are independent items that appear in the position that DPs fill, namely SpecAgr, and as such they can be left out in a coordinated structure. At this stage subject clitics do not seem to be different from modern French subject clitics.

Subject clitics are argumental clitics in the sense that they start out from the basic position of the subject inside the VP and absorb the subject theta role. In fact they are incompatible with a QP in the subject position, as (19) shows, and they never cooccur with a variable trace of the subject as in questions or in relative clauses: <fn.8>

- (19)a Ognon vora` acomodarse de si bela stampa (Calmo p.66)  
 Everyone will take for himself this beautiful picture
- b Chi volesse formar un teatro de bontae (Calmo p.96)  
 Who would like to be a theater of goodness
- c Quante persone che vederà` ste cossete stampae (Calmo p.66)  
 How many persons that will see this little things printed

The subject clitic does not normally appear even when the subject

is an DP:

- (20) Un'arma longa fa sta indrio el so nemigo (Calmo p.96)  
A long weapon makes stay behind the enemy

The same is true if the subject is a tonic pronoun:

- (21) Mi ve adoro (Calmo p. 128)  
I (+stress) you adore

As we are examining a dead language, it is impossible to determine for sure if the sequence Quantifier-subject clitic or the sequence wh-subject clitic are ungrammatical. The only negative proof that can be given is the absence of such a sequence in the corpus examined, which consists of the first 100 pages from a play by the author Ruzante for the Paduan variety and of the first 100 pages from a letter collection by the author Calmo for the Venetian variety. From the fact that they alternate with the subject DP in SpecAgr, (cfr. (20) and (21)) we can conclude that subject clitics of the Veneto varieties of this period are not agreement morphology in the sense that they are not always obligatorily realized as verbal agreement morphology is, independently from the element that appears in the preverbal subject position SpecAgr.

On the basis of the examples regarding coordination and the position with respect to negation in (17) and (18) we can conclude that subject clitics of RVe are not heads that adjoin to the head of AgrP where the inflected verb is.

On the basis of the distribution of subject clitics with respect to a subject QP or to a subject variable trace, we can assume that subject clitics are true arguments in RVe, (cfr. (19)) because they absorb the subject theta role.

In RVe, as in the Fiorentino variety of the Eighteenth century

studied by Renzi (1989), subject clitics are not yet reduced to heads adjoined to Agreement, they are independent syntactic DPs as modern French subject clitics are.

The fact that subject clitics in RVe are similar to their modern French counterpart does not entail that RVe is a non pro drop language as modern French is. On the contrary, it is quite common to find examples of null subjects. <fn.9>

Nevertheless their distribution is complicated by the fact that the possibility of a null subject seems to vary with respect to the main versus embedded character of the sentence. In the following discussion we will consider separately main and embedded clauses. As Vanelli (1987) noted, null subjects are more numerous in embedded clauses than in main clauses. In particular they are found in embedded sentences when an element like si (if), a wh operator or a subjunctive complementizer occupies the head of the Comp projection. In the literature there are some well known cases of asymmetry between main and embedded sentences, as for instance the verb second phenomenon, and they are all treated as a function of the difference between the C head of a main clause, which is not selected and in some cases just not present and the C of an embedded clause, which is in some intuitive sense the head of a clausal argument. Then it seems reasonable to treat the difference noted with respect to null subjects in RVe as a function of the head C. Let's consider the data for first.

Expletive null subjects of verbs that do not assign a theta role to the subject are possible in both main and embedded clauses:

(22)a E` certo che... (Calmo p. 97)  
Is sure that

b ...manco mal sarave a dir (Calmo p. 74)  
...luckly (it) means that...

Nevertheless, null subjects are not obligatory: it is possible to find examples of expletive subject clitics realized in both main and in embedded contexts:

(23) El me par che' l sarave cossa giusta (Calmo p.111)  
It to-me seems that it would be right thing

As in (23) the preverbal subject position is occupied by a subject clitic both in main and in embedded contexts, we have to state that RVe pro drop is in some sense "weaker" than that of modern Italian. In Italian the expletive element that occupies the preverbal subject position can only be a null element, while RVe has the choice between the two possibilities.

It is interesting to note that there is a difference between the distribution of expletive subject clitics in the case of a verb which does not assign a theta role to its subject and cases of expletive subject clitics with postverbal subjects. An expletive clitic with a postverbal subject can only be omitted in embedded sentences if the element in Comp is a wh-item, a si (if) or a subjunctive complementizer and never appears in main clauses, as (24) shows:

(24)a L'e` pur una dolce cossa (Calmo p. 99)  
It is indeed a sweet thing

b Si \_ no resta altro (Calmo p. 94)  
If \_ not remains (anything) else

In (24a) the expletive element is a subject clitic which occupies the SpecAgr position. No null subject is licensed in this structure. A pro subject can in fact only be licensed in embedded

clauses with a particular type of complementizer, as (24b). The contrast between (24a) and (22a) indicates that there must be a difference between an expletive subject which does not get any theta role and an expletive subject which is coindexed with a postverbal thematic position. The difference noted between an expletive *pro* which is connected to a postverbal subject and an expletive of a verb which does not assign a theta role to its subject is the same that we find among the persons of the verb. Second person singular and third person singular and plural argumental null subjects can only be realized in embedded sentences if the Comp projection is filled by a *wh*-item, a *si* (whether) or a subjunctive complementizer.

In main clauses a second person singular or third person singular and plural subject is always realized as a subject clitic, never as a null element.

- (25)a ..Com fa l'orsa quando \_ se guz gi ongi (Ruz. p.105)  
 As does the bear when \_ sharpens her claws
- b Dire` a Ser Zuan che \_ la guarda ben (Ruz. p. 107)  
 (You)will say to Sir John that (he) look(+subj)at her
- (26)a ..Che tuta la zente, co \_ li vede, se ghe inchina (Calmo  
 ..That all the people,when (they) them see,bow p.75)
- b Si farae meglio... (Ruz. p. 102)  
 Whether (they) would do better to..

In other words, the possibility of a *pro* depends on the features realized in *C*. In a main clause, *C* is not realized at all. Hence it cannot license anything, because it is not present. In an embedded clause, *C* is always realized, because it contains the selectional features assigned by the matrix verb. Nevertheless, not every *C* is able to license a null subject. Only a *C* marked by

some feature, as for instance the feature+wh, is strong enough to license a null subject. If C does not contain any particular feature, it cannot license the null element, then the subject has to be phonetically realized as in main clauses. This entails that the normal subcategorization traits assigned by the matrix verb to the embedded clause and which are supposed to be realized in C, do not count for C to be a pro licenser. The intuition is that C counts for the pro drop theory only if it is "visible" in some sense to define.

On the contrary, the distribution of argumental null subjects of first person singular and plural and second person plural does not seem to be dependent on any feature in C. There are examples of null subjects of first person and second person plural both in main and embedded sentences:

- (27)a Ve suplico (Calmo p. 72)  
(I) pray you
- b Havemo buo notita che.. (Calmo p. 129)  
(We) have had news that..
- c Dire` a Ser Zuan che ..(Ruz. p. 107)  
(You+plur.) will say to Sir John that...
- (28)a Co avesse ben dissenao (Calmo p.111)  
When (I) had well dined
- b Quando aspetemo suto,...(Calmo p. 73)  
When (we) await dry weather,...
- c Si vole` scambiar tuto.. (Calmo p. 94)  
If (you+plur) want to exchange everything..

(27) shows that a first person singular and plural and a second plural null subject is possible in a main clause. Hence, a particular type of Comp ( as a +wh or a + subjunctive one) is not relevant for the licencing of the pro null subject. The relevant head that licenses and identifies the contentive features of the

null subject must then be the head of the Agreement projection. At this point we have two classes of null subjects. True expletives and first person singular and plural and second person plural null subjects can be licensed both in a main and in an embedded context. On the contrary expletives coindexed with an argumental subject position, second person singular and third person singular and plural null subjects are sensitive to the type of element which is realized in the Comp position: only a +wh or a +subjunctive Comp can license this type of pro. The situation can be resumed in the following schema:

(29)	MAIN CL.	EMBEDDED CL. -wh/-subjunct.	EMBEDDED CL. +wh/+subjunct.
expletive pro -theta	+	+	+
1.person sing.pro	+	+	+
1.person plur.pro	+	+	+
2. person plur. pro	+	+	+
2.person sing.pro	-	-	+
3.person. sing.pro	-	-	+
3.person plur.pro	-	-	+
expletive pro+postv.DP	-	-	+

Null subjects can thus be divided into two groups. We will refer to the first group of null subjects which are not sensitive to the type of Comp as extended pro drop. The second group of null

subjects which can only be licensed if the Comp projection has a particular type of feature (+wh or +subjunctive) will be termed as restricted pro drop.

Looking at the distribution of expletive subjects and argumental subjects in RVe, it is evident that the pro drop conditions in RVe are strongly reminiscent of the situation in Renaissance French (from now on RFr) type of pro drop studied in Roberts (1990) (see also references quoted there).

In RFr the distribution of the null subjects as described by Roberts (1990) can be resumed as follows: expletive subjects, first person plural and second person plural null subjects can be found in both main and embedded clauses.

On the other hand first person singular, second person singular, and third person singular and plural can only be licensed in embedded contexts and only if there is a +wh-item in the Comp projection of the sentence.

The distribution of null subject in RFr is thus the following:

(30)	MAIN CL.	EMBEDDED CL. -wh/--subjunct.	EMBEDDED CL. +wh/+subjunct.
expletive pro	+	+	+
1.person plur.pro	+	+	+
2. person plur. pro	+	+	+
1.person sing.pro	-	-	+
2.person sing.pro	-	-	+
3.person. sing.pro	-	-	+

3.person  
plur.pro

+

The table in (30) shows exactly the same partitioning of table (29) between extended and restricted pro drop.

If we compare the distribution of null subjects in RFr with the distribution of null subjects in RVe, the similarity is striking: in RFr only first person plural and second person plural null subjects are admitted both in main and embedded clauses independently from the features of C. IN RVe only first person singular and plural and second person plural null subjects are admitted both in main and embedded clauses. The only difference concerns the first person singular, which behaves like a restricted pro drop in RFr, while in RVe it behaves as an extended pro drop. Once we have stated that RVe and RFr share the same double system of extended versus restricted pro drop, let's examine how the system can be formalized within the context of the theory of pro drop elaborated in Rizzi (1986a) that we are assuming here.

A simple observation regards the head that licenses a pro. Both C and Agr can be pro drop licensors. Hence we have to formulate the pro drop parameter for RFr and RVe as containing two licencing heads, namely C and Agr.

In both languages it seems that only a head marked with some special feature is able to license a pro. This observation is not only valid for C, but also for Agr. Infact, only a morphologically strong Agreement, as for instance second person plural is visible for the pro drop licencing condition, but a weak one, as for instance third person, is not.

Let's assume that it is so, namely that only if Agr or C are "strong" can they license a null subject. The definition of strong must include both a distinct phonetically realized morpheme as is the case for Agr and a particular feature like +wh or +subjunctive, as is the case for C.

So, if C is strong, as in +wh and +subjunctive embedded clauses, null subjects are licensed for every person. In main clauses, where C is not active, only a strong Agr can license a null subject: given that only first person and second person plural are strong, null subjects are possible only for these persons. Formalizing this idea we obtain:

(31)a C is a pro drop licenser if it is strong

b Agr is a pro drop licenser if it is strong

(32)a C is strong when it contains a +wh or + subjunctive feature

b Agr is strong when it contains a morphologically realized +person and +number feature

A system like that described in (31) and (32) generates the split between extended and restricted pro drop that we have seen in (29) and (30) for RVe and RFr.

So the difference between extended and restricted pro drop derives from the fact that C is not always marked with a strong feature, while Agr, once it selects a strong feature that includes both number and person, must always realize it.

The fact that C can be strong is thus determined by the syntactic environment, while this is not the case for Agr.

If the systems of RVe and RFr are really parallel, how is it that Veneto has developed following a different evolutionary line with respect to French? Why has Veneto become a pro drop language

where subject clitics are heads in Agreement, while French has developed into a non pro drop language?

I do not think that verbal morphology is of such a great importance in this matter, that we can attribute the different evolution of these two languages only to the difference in the number of the morphological distinctions on the inflected verb.

In other words, the richer morphological paradigm of the Veneto variety is not the only factor that has determined the evolution of this language into a pro drop language.

I would like to connect the different evolution of French and Veneto not only with the number of morphological specifications on the verbal head, but with the relative balance between verbal morphology and the paradigm of the subject clitics.

The different evolution of RFr and RVe is a particular case of a generalization formulated by Renzi and Vanelli (1983), which states that the subject person and number features must always be phonetically expressed by Agreement or by the subject itself.

In other words there must always be at least one element, verbal morphology or the subject pronoun itself that expresses the number and person features of the subject. This seems to be true for all Romance dialects examined by Renzi and Vanelli (1983).

Both RFr and RVe have a restricted system of pro drop and six subject pronouns which appear in the SpecAgr position.

But, in RVe the subject clitics of first person singular, plural and second person plural have the same form a or e depending on the variety. (cfr (16)) In RFr the series of subject clitics has a distinct element for all persons of the verb.

Hence even in RVe, not only in modern Veneto, the inflectional features are the only element able to identify the number and the person of the subject. Even if the subject clitic is in SpecAgr, it has no features that could convey informations about the subject.

As in RVe subject clitics are not always distinguished for person and number, so RVe has no other choice than to maintain the person and number features on Agreement, reinterpreting subject clitics as heads for the persons that are not fully specified by verbal morphology. French on the contrary, having a full discrete series of subject clitics, has been able to keep them as true DPs, further limiting the role of Agreement as pro drop licenser.

Hence, the factor that has determined the split between French and the Veneto variety (and probably other Northern Italian dialects as well) is not only the different number of morphological specifications on the verb. It is the relation between the number of morphological specifications on the verb and the number of morphological specifications on the subject clitics.

It is interesting to note, however, that both languages have evolved in a way that respects Renzi and Vanelli's generalization: the person and number features of the subject are realized at least once in both languages. The necessity of expressing these features can thus be considered not only as a synchronic property of Romance dialects in general, but also a diachronic tendency to maintain a sort of balance between the features expressed in Agr and in its Spec position.

In the next section we will examine a problem which is strictly connected with the pro drop system and the subject clitics distribution, namely postverbal subjects.

## 2.2 POSTVERBAL SUBJECTS

There is another quite interesting problem that is connected with the facts discussed up to now, namely the free inversion cases in RVe noted by Vanelli (1987) with a subject clitic in preverbal position.

Vanelli observes that examples like (33) constitute a puzzle for Case theory, given the hypothesis that subject clitics are true subjects in RVe (cfr. section 2.1):

(33)a El viene quel so fraelo (Ruz. p.94)  
Cl comes that his brother

b L'e` sta suspeso le prediche al Sior Geronimo (Calmo p.15)  
Cl is been suspended the sermons to Mr. Geronimo

(33a) presents a case of postverbal definite subject with an ergative verb and a subject clitic which is realized in preverbal position. On the basis of the discussion about the position of subject clitics it is clear that they cannot be considered as morphological affixes at this stage of evolution. They are true DPs which absorb the Case of the subject. The problem for the theory is presented by the fact that the definite subject in the postverbal position needs a Case too. It is generally assumed that two phonetically realized elements cannot absorb the same Case (cfr. Kayne (1983)). So, in this structure we need two distinct Cases, one for the subject clitic and one for the postverbal subject DP. <fn.10>

Looking at verbal agreement it seems that the nominative Case is

assigned to the subject clitic, because the verb agrees with the clitic and not with the subject DP. In (33b) the postverbal DP is feminine plural, but the verb is marked as masculine singular on the past participle and as singular on the auxiliary.

We will thus assume that the subject clitic in preverbal position absorbs the nominative Case, as the verbal morphology indicates. What about the postverbal DP? The Case assigned to the postverbal DP cannot be accusative, because the verb is an ergative one. It cannot either be the partitive Case postulated in Belletti (1988), because partitive is assigned only to indefinite DPs and the DPs in (33a/b) are both definite. So the Case assigned to the postverbal DP can be neither nominative through Spec-head agreement with the head of AgrP nor Partitive. In order to solve this problem, we have to consider how nominative Case is assigned. I will assume Roberts' (1990) idea that nominative Case can be assigned in two different configurations: Spec-head Agreement with the head of AgrP and Government by the head of TP. The possibilities of nominative Case assignment correspond thus to (34) (cfr. Roberts (1990) pag 29 ff.):

(34)a Agr assigns Case through Spec-head Agreement.

b T assigns Case through Government

Such a parameter of nominative Case assignment has been proposed by Roberts in order to explain the difference between languages such as French and Welsh. In French the subject appears in the preverbal subject position and it triggers morphological agreement of person and number with the verb. Following Roberts' hypothesis, French exploits the possibility expressed by (34a). Hence the subject DP moves from its base position inside the VP

to the SpecAgr position, where it is assigned Case and it triggers morphological agreement of number and person.

On the contrary, in Welsh the subject appears after the inflected verb and it does not trigger morphological agreement of person and number. This means that Welsh adopts (34b): the subject DP does not need to move to SpecAgr, on the contrary it must remain in situ, in order to get nominative Case assigned by the head of TP. Given that there is no Spec-head Agreement relation between the subject DP and the head of AgrP, there is no morphological agreement of number and person.

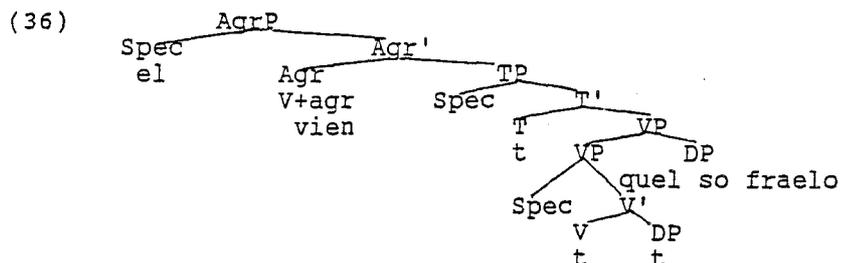
Roberts further assumes that in the Romance languages the subject can be in the postverbal position because both options in (34) can be selected: nominative Case can be assigned both by Spec-head Agreement with the head of AgrP or by Government from the head of TP. Nevertheless, languages like standard Italian always show morphological agreement of person and number between the subject DP and the verb, while Welsh never does. Roberts explains this difference on the basis of the observation that in Welsh AgrP is never active in nominative Case assignment, while it is in Romance. On the basis of this difference, a rule of cosuperscripting between the heads of AgrP and TP applies in Romance, but not in Welsh.

(35) Coindex Agr and T

A rule like (35) will thus be active in the Romance languages because both Agr and T are able to assign nominative, but it will fail to apply in Welsh, because Agr in Welsh is inert with respect to nominative Case assignment. This cosuperscripting

determines the passage of morphological agreement features of person and number so that the verb and the postverbal subject agree in person and number in Romance.

Let's now consider the structure of sentences like (33):



In (36) the subject clitic el is realized in SpecAgr, while the postverbal subject is inside the V governed by the head of TP. It is possible to think that in RVe, as in other Romance languages both mechanisms of Case assignment can be exploited, namely that the head T can assign Case to the postverbal subject DP through government and the head of AgrP can assign nominative through Spec-head Agreement. It is interesting to note, however, that in RVe ( as in modern NIDs) no agreement of person and number between the verb and the subject DP appears to be active. In other words, RVe is more similar to Welsh than to standard Italian and other Romance languages.

We have to assume that the rule of cosuperscripting postulated in (35) for Romance languages does not apply here, but why? Also in RVe there are preverbal subjects that trigger morphological agreement of person and number with the verb. Hence also in RVe the AgrP projection is active for the nominative Case assignment, exactly as in other Romance languages. The fact that the rule of cosuperscripting fails to apply is it a mere coincidence or not?

And, if it is not, is it connected with other particular selectional choices that the grammar of the dialect in question makes? It seems plausible to think that the fact that rule (35) does not apply in RVe is somehow connected with the particular type of postverbal subjects observed in this dialect.

In other words, the fact that there is no cosuperscripting must be related to the problem of Case assignment to the postverbal subject in a structure like (36). We already excluded that the postverbal subject DP receives Partitive Case, because it is a definite DP. It cannot receive nominative Case through a chain with the expletive, because the expletive is a phonetically realized element, and it needs a Case of its own.

As assumed by Kayne (1983), two phonetically realized elements cannot be in the same chain and share the same Case, while an overt and a silent element can.

Considering the nominative Case assignment possibilities expressed in (34), we can make the hypothesis that Case is assigned to the postverbal subject DP by the head of TP, while the expletive in preverbal position receives nominative through Spec-head agreement with the head of AgrP.

At first sight, it might seem strange to assume that two nominative Cases are assigned at the same time, even in different structural configurations and by different heads.

Note however, that a system of nominative Case assignment like (34) does not specify anything about the possibility that both heads assign Case at the same time. In a language that selects both heads Agr and T as nominative Case assigners it could be the case that the two heads are both active, and that two different

DPs get nominative Case, one through Spec-head agreement with the head Agr and one through Government by the head T.

This double mechanism of Case assignment is restricted by theta theory that admits only one DP for each thematic role assigned by the verb. So, even if there are two possible nominative Cases available, only one of the two will be realized, because there is only one subject theta role. If both nominative Cases are assigned to two distinct DPs, one of the two will be left without a thematic role, violating the theta criterion. There is only one case in which an DP can be left without a thematic role, namely the case of an expletive.

A structure with double Case assignment is thus possible only when one of the two elements is an expletive. Furthermore, the expletive element must be the higher one, because SpecAgr is the non-thematic position. If the expletive were realized in the postverbal position and the subject DP in the preverbal one, it would be impossible for the subject DP to receive the subject theta role, which is assigned inside the VP.

The only case in which the two nominatives can be assigned thus corresponds to a structure like (36) which does not violate the theta criterion. The subject clitic in SpecAgr is in fact an expletive, and as such it does not absorb the subject theta role, while the postverbal subject DP does.

Hence, Rve has the possibility of exploiting both options expressed in (34) at the same time. Moreover, it must do so, otherwise one of the two elements would remain without a Case.

This does not seem necessary for languages such as standard

Italian or standard French. In standard Italian in fact there is a null element in preverbal position, and not a phonetically realized one. In this case Kayne's restriction about the presence of two elements sharing the same Case does not apply, because one of the two is silent. Hence, standard Italian does not need to exploit both options of nominative Case assignment described in (34) at the same time. The same is true for French postverbal subjects in the case of Stylistic Inversion: in the preverbal position a *pro* is licensed probably by a +wh C (see Kayne and Pollock (1978)), and the subject DP receives Case directly from the head of TP.

Once we have seen how the mechanism of Case assignment works in a structure like (36), we can go back to the hypothesis that it may be connected to the difference that we noted before with respect to morphological agreement of person and number. In standard Italian and French postverbal subjects trigger morphological agreement with the verb, while in RVe this is not the case. In order to explain this fact, we assumed Roberts' cosuperscripting rule between the heads of AgrP and TP to be active in Romance but not in RVe. It seems that when the cosuperscripting rule applies, the two heads of AgrP and TP are treated as one, both with respect to the morphological features of person and number and with respect to the Case assignment.

We can thus assume that the rule of cosuperscripting blocks the independent Case assignment by the two heads that are able to assign it. Hence the double head constituted by Agr+T can only assign Case once: through Government or through Spec-head Agreement. On the contrary, when the cosuperscripting does not

apply, the two heads are considered as distinct elements by the grammar: they do not share morphological agreement features and can both assign Case independently.

In RVe the rule of cosuperscripting cannot apply, otherwise one of the two nominatives would get lost and the lexical expletive or the postverbal subject DP would remain without a Case.

Moreover, a structure like (36) is the one in which the possibility of a double Case assignment is realized, because it is the only Case which is not blocked by the theta criterion.

If the rule in (35) does not apply, no sharing of the morphological features between Agr and T is possible: hence the verb must agree with the preverbal expletive clitic and not with the postverbal DP. In particular, we expect that there will be no Cases of a lexical expletives in free inversion structures, in which the verb agrees with the postverbal subject. A structure like (37) should never be found:

(37) \*L'e` vegnudi i to fradei  
Cl are come+ plur. agr. your brothers

This seems to be true, in particular in the case of RVe, as far as I could test. As L. Vanelli pointed out to me this fact seems to be general in NIDs. The solution that we propose here for RVe inversion could possibly be adopted also for other languages, as for instance the Occitan varieties or the Fiorentino variety of XVIII century and modern popular French studied by Renzi (1989). The situation in Fiorentino seems to be more or less parallel to RVe, as Renzi (1989) has shown. Our prediction seems to be correct at the present state of knowledge concerning these languages.

There is another important consequence that derives from this analysis that deserves some brief comments.

The solution presented here in fact does not directly connect pro drop and free postverbal subjects as consequences of the same parameter. This hypothesis seems to be confirmed by other

Romance languages, as for instance Portuguese, which has the possibility of null subjects but does not show the possibility of free postverbal subjects.

This seems to be correct also on the basis of languages such as Occitan, and modern popular French which do not show null subject but admits free inversion. However, the mechanism exploited by RVe in structures like (36) must be a more marked choice in the grammar because two heads, which are normally very closely connected, are compelled to be kept separate and are independently active in assigning Case at the same time. In other words, it is probable that the unmarked choice for Romance corresponds to the cosuperscripting between Agr and T, given the generalized movement of the inflected verb up to both heads, and that a coalescence of morphological endings of Tense and Agreement is quite often observable in this group of languages. Therefore, the languages that exploit the mechanism described for RVe must be less numerous with respect to languages that exploit the standard Italian system, in which there is only one Case for the chain, given that one of the two elements is empty.

### 2.3 VENETO OF THE XVII CENTURY

In this section we will consider how subject clitics and the pro

drop system of RVe further developed into a variety which still survives in some very conservative areas. The text examined is the Oda Rusticale, (see. Tuttle (1983)) which dates from the (1688) about one century after the Calmo and Ruzante texts examined in section 2.1.

During this period subject clitics have developed one stage further, from phonological clitics to syntactic clitics.

They have become clitic heads as their modern counterpart and not subject DPs as RVe subject clitics.

The tests that reveal this change, are those used in section 2.1 for RVe: the order with respect to the preverbal negative marker and coordination of two VPs when the subject pronoun is deleted. In the Veneto variety of the XVII century (from now on S<sub>Ve</sub>) some subject clitics appear at the right of the preverbal negative marker:

(38) Perche` no la pole            ( Oda p. 441)  
      Because not she can

(39) No i te fa male            (Oda p. 443)  
      Not they to-you do harm

In a sample of 145 sentences there are no cases of coordinated structures, so the second test cannot apply. We are thus compelled to base our analysis only on the fact that subject clitics appear at the right of the preverbal negative marker, and for this reason they are to be considered heads at S-structure. As discussed in section 1.2, the fact that a subject clitic appears after the negative marker shows that subject clitics and subject DPs do not occupy the same position in the Syntax: subject DPs infact can only appear at the left and never at the

right of the negative marker. Hence, we can conclude that SVE subject clitics are analogous to their modern counterpart.

So, it seems that subject clitics have been reanalyzed, during the period between the XVI and the XVII century, as part of the inflectional head of AgrP. As already discussed in section 1.2, this does not mean that subject clitics at this point of their evolution are not arguments in the sense that they do not absorb the subject theta role. Even if they are heads, they can start out from a thematic position inside the VP and adjoin to the head of Agr blocking the insertion of another subject, because the thematic position is filled by the trace of the subject clitic.

Object clitics in Romance have normally the distribution of argumental heads: when the object clitics are inserted, no object DP can be phonetically realized and no variable can occupy the object position.<fn.11>

If we apply the tests already discussed in section 1.2, we are compelled to admit that subject clitics of this period are bound to an argumental position. A subject clitic is not required when a subject DP is present, as in (40):

(40) I to roere vale pi` che no valse qui de Hisperite  
Your oak woods are more precious than not those of Hesp.  
(Oda p.442)

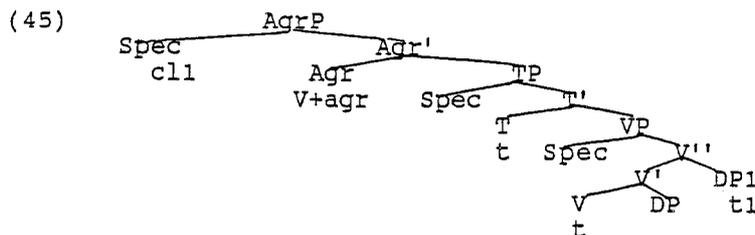
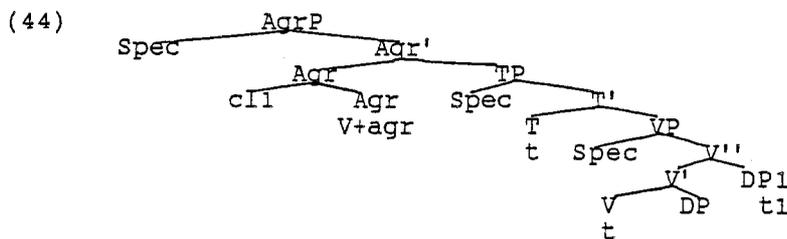
Subject QPs always appear without a subject clitic and there is no subject clitic when the subject is marked +wh and moved outside the sentence:

(41) Agno pomaro fea pumi indore` (Oda p.441)  
Every apple tree made golden apples

(42) Agnun che bita dentro i tredese comun (Oda p.443)  
Everyone that lives in the thirteen villages

(43) Chi po far ritirare el mare si` ingordo? (Oda p. 443)  
 Who can let retreat the sea (which is) so greedy

(40), (41), (42) and (43) show that subject clitics in S<sub>Ve</sub> are parallel to object clitics: they absorb the subject theta role and are incompatible with other subjects in argumental position. Therefore, the structure of a sentence with a subject clitic will be (1) (here repeated as (44)): <fn.12>

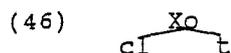


In (44) the subject clitic starts in the VP internal subject position as the trace t<sub>1</sub> under DP1 indicates, and moves up to Agr. It ends up in an adjoined position to the the head of AgrP where the inflected verb is placed after having incorporated the affixes of Tense and Agreement. This kind of adjunction position is the same as that postulated for modern NIDs, (cfr. (1)). On the contrary (45) describes the situation that we found in R<sub>Ve</sub>, in which subject clitics are still equivalent to maximal projections in the syntax and are clitics only at PF. The difference between (44) and (45) can be interpreted as a modification of the subject clitic, which changes its categorial

status. It is no longer analyzed as an XP that does not branch, as it does not have a Specifier and a Complement position, but as a simple head. As the structure preservation principle states that all XPs must move to an XP position and all X must move to head positions, the subject clitic can no longer move to the SpecAgr position, which is an XP position, it can only move up to the head of this projection from the basic subject position inside the VP. Hence, the reanalysis of subject clitics as heads implies that they move to a head position.

As (44) illustrates, subject clitics move to the head of AgrP.

We can imagine different motivations that induce subject clitics to move just into this head: first of all no head containing a trace can host the subject clitic. T and V are both occupied by the trace of the verb which has moved to Agr. If the clitic adjoined to T or to V, it would induce minimality between the trace and the inflected verb in Agr, yielding a structure like (46):



A configuration like (46) is excluded by Baker (1988), in fact the subject clitic would be a closer potential governor for the trace in T and it would prevent the correct relation between the verb in Agr and its trace in T.

Hence the subject clitic must adjoin to a head which is not filled by a trace, but by a phonetically realized element, and only Agr is such a head.

Second, the movement of the subject clitic to a left adjoined position to Agr recreates the same configuration at the X level

that subject DPs have with Agr at the XP level. Adjunction of the subject clitic is structurally similar to a relation of Spec-head Agreement, but at a lower level. <fn.13>

Third, if we consider Kayne's (1989) proposal that all syntactic clitics move to the head of AgrP in Romance, then also subject clitics, being syntactic clitics, will be attracted by this head. At this point we can ask if the reanalysis of subject clitics from purely phonological clitics as in RVe to syntactic clitics in SVe exerts some influence on other fields of the grammar.

In particular we expect that the processes connected with the AgrP projection are influenced by this readjustment of the structure of Agr. Let's for instance take into consideration the pro drop system. We saw that the pro drop system of RVe is fairly complex. Two heads are marked as possible pro licenser, namely C and Agr. But only in the case where they are filled by a particular feature are they visible for the pro drop licencing condition.

Looking at the data, it may seem strange to postulate a pro drop system for SVe, because in this dialect, there seem to be no cases of null subjects at all. Infact, a subject clitic or a subject DP is always phonetically realized.

- |       |                                    |              |
|-------|------------------------------------|--------------|
| (47)a | Quand' <u>a</u> me tacco a cantare | (Oda p. 440) |
|       | When I me begin to sing            |              |
| b     | Te si ti solo                      | " "          |
|       | You are YOU alone                  |              |
| c     | La mormolla de ti                  | " "          |
|       | She murmurs of you                 |              |
| d     | A sagion darne..                   | " "          |
|       | We know to give                    |              |

e	O golusi slecaizzi ch'a si`	"	"
	Oh, greedy that you are		
f	Quel ch'i dise	"	"
	What that they say		

At a superficial glance, it seems that pro drop has completely disappeared from the language. Infact, there is a subject clitic which is obligatory for all the persons of the verb, a phonetically realized subject DP, or a variable in the case of wh-movement of the subject.

One may assume that the pro drop character of RVe has been completely lost during this century and that SVe is a non pro drop language. Things do not appear to be so simple if we consider that subject clitics are no lonver true subjects in SVe, but heads, as indicated by the tests in (38) and (39) and by structure (44). At this point three questions arise:

- (a) If subject clitics are heads, what kind of element fills the SpecAgr position?
- (b) Why are subject clitics obligatory, when there is no other phonetically realized subject DP?
- (c) Why have pro drop phenomena disappeared?

On the basis of the Extended Projection Principle, we must assume that SpecAgr is filled by some element, because the preverbal subject position cannot be left totally empty in any language.

Hence, a null category must fill it: this category cannot be a variable, because it is not bound by any operator, it cannot be an DP-trace or a PRO, because it is a Case marked position.

The only category that can occupy the SpecAgr position is a pro. This element, as all null categories, has to be licensed by a

head which in RVe was Agr or C. We have seen that in SVe subject clitics are obligatory when there is no subject DP, but that they do not cooccur with subject DPs. If subject clitics appear only when a pro, and no subject DP occupies the SpecAgr position, we can make the hypothesis that the head that licenses the null subject is neither Agr nor C, but the subject clitic. The pro drop conditions of SVe are expressed in (48):

(48) pro is licensed by a clitic head in Agr through Spec-head agreement

The null subject is coindexed with the subject clitic which licenses it through Spec-head agreement.

We can thus answer the question (b): subject clitics are always obligatory when there is no phonetically realized subject DP because they license pro. If the subject clitic is omitted there is no head that can license pro and the sentence is ungrammatical.

At this point the answer to the third question is quite simple. Pro drop phenomena have not disappeared from the language at all. On the contrary, they are more widespread in the language than before. The change regards only the type of head that licenses the null subject. This head is neither C nor Agr as it was in RVe, but the subject clitic adjoined to Agr. The obligatory presence of a subject clitic simulates the requirement of a non pro drop language, in which a subject pronoun must always be present. The subject pronoun of SVe is nevertheless not a true subject DP, but a syntactic clitic in Agr. SVe is thus a pro drop language as standard Italian is, but it differs from standard Italian because the head that licenses pro is not Agr itself, but

a subject clitic adjoined to Agr.

The structural configuration is the same in the two languages, namely Spec-head agreement, but the head that licenses the null element is different.

SVe has lost both strategies of pro licencing that we found in RVe, neither C, nor Agr are possible pro drop licenser. It has developed into the direction of a simpler system, in which only one head can license pro and only through a unique structural configuration. We see that the evolution of French and the Veneto variety are in some sense parallel. Also Modern French has infact completely lost the possibility of pro drop licencing through Spec-head agreement with the head Agr: no first or second plural person null subjects are admitted in modern French as is the case in RFr. French has maintained the pro drop licencing from C through government, when C is marked +wh or + subjunctive, even if only for expletive subjects (cfr. Kayne and Pollock (1978)):

(49)a Quand pro viendra Jean?  
When will come John?

b J'aimerais que pro sorte Paul  
I wish that goes out Paul

SVe has lost both pro drop licencing from C or Agr, but it has developed a new system, in which another head has this function. Both SVe and French have developed into systems in which Agr is not a possible pro drop licenser. This is the reason why they both have maintained subject clitics. As has often been noted in the literature, the languages that have developed subject clitics are precisely those that, in their mediaeval stage, could only

license a pro through Government by Agreement, which had moved to C in accordance with the Verb Second constraint. Agreement was not able to license a pro through the configuration of Spec-head agreement. The similarity between French and SVe is to be found in the fact that in both languages Agr was not able to take up the function of pro licenser through Spec-head Agreement as it was the case in Southern Italian Dialects and other Romance languages as Spanish.

This weakness of Agr (which we assume to be syntactic and not only morphological) has brought about the development of an alternative system in SVe: a subject clitic licenses pro because Agr is not strong enough to do it in the relevant configuration of Spec-head Agreement.

This system is still adopted by some conservative varieties in isolated areas. This fact is very important because it permits us to study the licencing conditions of a dead language such as SVe more deeply and to check our predictions by constructing ungrammatical sentences.

One such variety is Rovignese spoken in Yugoslavia in the town of Rovigno. The subject clitic series of Rovignese is complete for all persons (cfr. Tekavcic (1986)):

(50)	1.	2.	3.	1plur.	2.plur	3.plur
	i	ti	el/la	i	i	i/le

When a subject DP is not realized, a subject clitic is obligatory:

(51)a Sa \*(ti) me dive la paca  
 If you to-me give a hit

b \*(A) ta par  
 It to-you seems

The subject clitic is not obligatory when there is phonetically realized subject DP:

- (52)a Se Paron Giacomo gira furbo...  
If Mr. Giacomo was clever
- b La Francia gaviva tuchisto tira` veia suldadi de l'Istria  
The France had had to take away soldiers from Istria
- c La feila spativa  
The girl waited

Indeed, subject clitics and subject DPs in SpecAgr must be incompatible. Infact if we substitute the definite subject DP with a QP, which cannot be left dislocated and can only occupy the SpecAgr position, the subject clitic cannot appear:

- (53)a Qualunque pol meti la man sul fogo  
Everyone can put the hand on the fire
- b \*Qualunque el pol meti la man sul fogo  
Everyone he can put the hand on the fire

This case is analogous to SVe: in SVe a subject QP always appears without a subject clitic, but we don't know if the structure QP+subject clitic is excluded or simply is not realized in the corpus of data that we take into consideration.

If Rovignese has the same system that we outlined for SVe, we can check if subject QPs are really incompatible with subject clitics. (53b) shows that this is correct.

The type of system displayed by Rovignese seems to be quite common in the Southern part of Veneto, where subject clitics are obligatory for all persons and only possible when no subject DP is realized.

In SVe, as in Rovignese subject clitics have developed into syntactic heads specialized for the licencing of a null subject,

taking up the role that Agr and C had in RVe.

### 3.1 THE MODERN TRENTINO VARIETY

In this section we will examine another variety, namely modern Trentino, (TR) in which it seems that subject clitics have specialized for another function of Agr, namely nominative Case assignment. We can assume that also in TR subject clitics of the Renaissance period were XPs at S-structure as in all other NIDs (cfr. Vanelli (1987) for Friulano, Milanese and Piemontese).

Subject clitics were then reanalyzed as heads, like in SVe ( and probably in all NIDs) assuming the status of syntactic clitics.

Furthermore, subject clitics of first person singular and plural and second person plural were lost, so that in modern TR subject clitics have a defective paradigm, as (54) shows:

(54)	1.	2.	3.	1.plur	2.plur	3.plur
	-	te	el/la	-	-	i/le

As only three persons have subject clitics, it is impossible to assume that the pro drop parameter selects a clitic as the head that licenses null subjects as it is the case in SVe. The first person and second person plural null subjects must be licensed by Agr, because there is no subject clitic in these cases.

Moreover, subject clitics in TR do not alternate with subject DPs. On the contrary they seem to be obligatory even when a subject DP is realized in SpecAgr:

(55)a La Maria la riva  
The Mary she comes

b \*La Maria riva  
The Mary comes

It is interesting to note that when the preverbal subject is a

QP, the sentence is ungrammatical if a subject clitic is realized:

(56)a \*Nisun el vien qua  
 Nobody he comes here

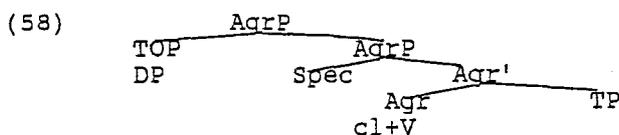
b ?Nisun vien qua  
 Nobody comes here

Indefinite DPs behave like definite ones, they always need a subject clitic:

(57)a Un putel el vien qua sempre  
 A boy he comes here

b \*Un putel vien qua sempre  
 A boy comes here

This contrast between DPs and QPs is a well known fact, and has been interpreted (cfr. Giupponi (1988)) as an obligatory left dislocation of the subject. The structure of a sentence like (57) would be (58):



In (58) the subject DP is in a TOP position adjoined to the AgrP. This structure does not violate any general principle of the grammar, and is perfectly compatible with what we already know about Romance, but it is difficult to imagine a mechanism that renders Left Dislocation of the subject in the TOP position obligatory. Therefore, we will explore another way to explain why a subject clitic is always obligatory when a subject DP is realized in preverbal position.

We already noted that subject clitics in this dialect cannot be connected to the licencing of a null subject, because the series is incomplete and subject clitics are obligatory even when a

definite or indefinite preverbal subject DP is present.

Nevertheless subject clitics must have a function, otherwise their obligatoriness would remain unexplained, and this function must be somehow connected to the Agreement head to which the clitic is adjoined. It is interesting to note that postverbal subjects do not require any subject clitic (cfr. Brandi and Cordin (1981)). This is true for any type of subject DP, definite DPs, indefinite DPs and QPs:

(59)a Riva la Maria  
Comes the Mary

b \*La riva la Maria  
She comes the Mary

(60)a No riva nisun  
Not comes nobody

b \*Nol riva nisun  
Not+he comes nobody

The impossibility of subject clitics with postverbal subjects can give us a clue to solve the problem. In section 2.2 we briefly presented Roberts' analysis of postverbal Case marking in Romance. A postverbal subject DP is assigned Case by the head T through Government and not by the head Agr. Note that subject clitics appear only when Agr assigns Case, namely with preverbal subjects and never with postverbal subjects, when it is T that assigns Case.

A plausible explanation for the distribution of subject clitics is derived if we assume that subject clitics in TR contribute to nominative Case assignment to the preverbal subject position.

The mechanism of nominative Case assignment to preverbal subjects in Romance exploits the configuration of Spec-head agreement

between the subject DP and Agr.

If we think of Case in terms of a visibility requirement, that must be satisfied in order to map the right theta role onto the right DP, we can assume that a subject DP in preverbal position can be rendered visible in TR through a chain with a subject clitic. In some intuitive sense, the clitic is the element that expresses the same features of the subject DP, hence the Spec-head Agreement relation is established with the clitic.

Nevertheless, we cannot assume that it is only the subject clitic that assigns Case and that Agr does not play any role in the Case assignment, otherwise we would predict that a subject clitic and a preverbal subject DP can appear even in infinitival sentences, in which Agr is not marked with the person and number features.

In the cases in which no subject clitic is realized in TR, namely the first person singular and plural and the second person plural, we admit that tonic pronouns are always left or right dislocated, as in standard French, and are assigned Case in the normal way dislocated elements are. ( cfr. Poletto in progress)

We can thus make the hypothesis that TR is different from standard Italian and other Romance languages, because it does not only need Agr to be in a Spec-head relation with the subject DP, but it requires also a morphological realization of the person and number features of the subject.

The Case chain of TR preverbal subject will thus be as in (61)

(61) C= DP, subject clitic, Agr

Under a strong interpretation of this proposal one may assume that the subject clitic is the nominative Case morpheme itself.

Now the fact that postverbal subjects do not require a subject

clitic, is perfectly comprehensible: the head involved in the nominative Case assignment is not Agr, but T. T assigns Case through Government to the VP internal subject position and the Agr projection is just not involved.

A quite important problem for this analysis of subject clitics as Case markers regards example (56), repeated here:

(56)a \*Nisun el vien qua  
Nobody he comes here

b ?Nisun vien qua  
Nobody comes here

If the subject clitic contributes to nominative Case assignment to a preverbal subject DP, why does the presence of the clitic render the sentence ungrammatical?

We know that Case assignment through the clitic establishes a coindexing relation with the subject DP, that we expressed in the form of a chain as (61). The chain formed in (56a) will thus correspond to (62):

(62)a C= QP, clitic, Agr

b C= vbl., clitic. Agr

We know that a QP must move at LF to an A' position leaving a variable as its trace. Thus, at LF the first member of the chain in (62a) will be substituted by a variable as in (62b). This yields an incorrect result, because variables cannot be A-bound, but only A' bound by a Quantifier. A chain like (62b), in which the variable is A bound by the subject clitic is thus filtered out at LF. ( cfr. also Jaeggli 1981) and Rizzi (1986) for discussion)

The only possibility is to omit the subject clitic, but in this

case how does the QP get Case in the preverbal position?

The problem does not seem to present a solution: if the subject clitic is realized, the structure is filter out at LF, if it is not realized, the QP does not get Case in preverbal position and the sentence is filtered out at S-structure.

A subject QP is surely grammatical in a preverbal subject position, even if it is not so natural as in the postverbal position (as the question mark in (56b) indicates). We can ask at this point what this preverbal position that the QP occupies is. Is it really the same position the DPs occupy or not? We know that there are at least three possible positions at the left of the inflected verb in Agr: SpecAgr, the position of a left dislocated element which we will define as TOP1 and the position of a topicalized element which we will call TOP2.

I will suggest that a preverbal quantifier can occupy only one of these three positions: it cannot clearly occupy a left dislocated position (as it is well known) because QPs cannot be bound to a pronominal element that appears in dislocated structures. For the same reason it cannot occupy the SpecAgr position, because in TR also this position is always coindexed with a pronominal element, namely the subject clitic.

A preverbal subject QP will thus be grammatical only in a topicalized position, hence in the TOP2 position. This explains why a sentence like (56b) has a restricted use. Topicalization in fact can be used only in order to contrast the element that is moved at the left of the sentence in the TOP2 position (see Cinque forthcoming for an analysis of the TOP2 as SpecC). The normal position of a subject QP is the postverbal one.

This is just what we predict on the basis of the nominative Case assignment discussed in the previous section.

The postverbal subject position gets Case through government by the head T, and this Case configuration does not impose any coindexing with a pronominal category as the subject clitic in order to get nominative. From this position the QP can move and reach a topicalized position, but it can never move into SpecAgr or TOP1, where it would receive no Case or be bound to a pronominal category.

There are some independent facts that indicate that the SpecAgr position is not available to QPs. First of all, a strong tendency that we observe when we force the QP in preverbal position to realize a preverbal negative marker, as in (63):

(63)a Nisun no vien  
Nobody not comes

b No vien nisun  
Not comes nobody

This indicates that the preverbal structure has been derived from a postverbal one, in which a negative QP requires the negative clitic (cfr. Zanuttini (1988)) as scope marker. In other words a sentence like (63a) is derived from (63b) moving the subject QP into the TOP2 position.

Another fact that points in this direction has been noted by P. Beninca` (p.c.). In some varieties QPs are realized as plural forms, which should trigger past participle agreement in the case of passive, as all deep objects that move to the SpecAgr position:

(64)a La mama l'e` sta` vista in piassa  
The mamy cl has been seen+agr in square

- b \*La mama l'e` sta visto in piassa  
The mummy has been seen-agr in square
- c E` sta visto la mama in piassa  
Has been seen-agr the mummy in square
- (65)a Nisuni l'e` sta visto in piassa  
Nobody cl has been seen-agr in square
- b \*Nisuni l'e` sta visti in piassa  
Nobody cl has been seen+agr in square
- c No e` sta visto nisuni in piassa  
Not has been seen-agr in square
- d No ghe n'ho visto nisuni de bei  
Not of-them (I) have seen noone+pl of nice+pl

In passive sentences the deep object triggers past participle agreement only when it is in the preverbal position (as in (64a)). This agreement process is obligatory for all deep objects that move into the preverbal subject position, SpecAgr, as (64b) shows, but not when they stay in the postverbal position as in (64c). <fn.14>

On the contrary, a preverbal plural QP never triggers past participle agreement, as (65a/b) illustrate, as it is the case when it remains in the postverbal subject position (cfr(65c)). Note that in (65d) the QP agrees with the adjective bei, which shows a plural ending. The preverbal QP behaves then as if it were in the postverbal position, both with respect to the negative scope marker and to past participle agreement. We can thus conclude that the preverbal QP position is not SpecAgr, as in the case of DPs, but a topicalized position to which the QP moves directly from the postverbal position.

Subject clitics in TR contribute to Case assignment to the SpecAgr position, which becomes a position for non-Quantifiers

only. Subject clitics have evolved differently in TR and in SVe. TR subject clitics have not specialized as pro drop licenser, as SVe subject clitics, but as nominative Case assigners. In both dialects we observe that the head Agr is in some sense weaker with respect to other Romance languages: in the case of SVe and modern French it cannot license pro, while in TR it is not sufficient to assign nominative.

Agr is thus not only morphologically weaker in these languages than in standard Italian, it is also weaker in a syntactic sense, because it needs the support of a clitic in order to license a pro or to assign nominative Case. We see now that the relation between Morphology and Syntax is quite strong in the sense that a morphologically weak head is in most cases also syntactically weak, but the conditions of this syntactic "weakness" can vary and must be rendered more precise.

### 3.2 CLITICS AND AUXILIARIES

In this section we will examine the distribution of subject clitics which appear with the two auxiliaries have and be in various NIDs. A first indication that subject clitics that appear with auxiliaries (ASC) are different from subject clitics that appear with main verbs (VSC) has been pointed out to me by P. Beninca` (p.c.). While VSC are incompatible with a preverbal QP, ASC are always obligatory both if the preverbal subject is an DP or if it is a QP:

(66)a Nisun l'e` vegnu`  
Nobody he has come

b \*Nisun e` vegnu`  
Nobody has come

These data are well known and brought Rizzi (1986) and Brandi and Cordin (1989) to conclude that subject clitics are a part of Inflection, as they are always obligatory, independently of the element that occupies the SpecAgr position, be it a pro, an DP or a QP. If we compare (66) with (56) we obtain a minimal contrast:

- (56)a \*Nisun el vien qua  
 b ?Nisun vien qua

On the basis of this difference, it seems that subject clitics have a different distribution with respect to the presence versus absence of an auxiliary verb.

Another indication that forces us into this direction is constituted by the data of some Valdotain varieties studied by Roberts (1991). The subject clitic series which appears with auxiliaries is morphologically different from the subject clitic series that appears with other verbs: (Roberts (1991):(1b))

- (67)a Yo ei minja`  
 I have eaten  
 b T'at minja`  
 You have eaten  
 c Y at minja`  
 He has eaten  
 d N'en minja`  
 We have eaten  
 e Y ade minja`  
 You have eaten  
 f L'ant minja`  
 They have eaten
- (68)a Minjo  
 Eat (I)  
 b Te minje  
 You eat

- c Minje  
Eats (he)
- d Minjein  
Eat (we)
- e Minjade  
Eat (you)
- f Minjon  
Eat (they)

While the subject clitic series that appears with main verbs is not complete, the paradigm of subject clitics that appears with auxiliaries is not only morphologically different, but it contains a subject clitic for every person of the verb.

This fact is a strong argument in favor of the idea that the two series of subject clitics must be distinguished.

In Piemontese two subject clitics appear when the verb is the auxiliary have, while only one is realized with all other verbs:

- (69)a La maestra a sava nen tut  
The teacher she knew not all
- b La barca a l'a anda` a fond  
The ship she cl has sunk

In the case of direct interrogative sentences, Roberts notes that the ASC remains at the left of the verb, while the VSC adjoins at the right of the inflected verb, as in (70): (Roberts (1991):(9b))

- (70) L'est+e prest?  
Cl is+cl realdy

In some Veneto varieties, (as for instance in the dialect of the town of Cornuda that we use for the examples) the subject clitics that appear with auxiliaries alternates with object clitics, while subject clitics of simple tenses never do <fn.15>:

- (71)a Nisun l`a magna  
 Nobody he has eaten
- b Nisun m'a visto  
 Nobody me has seen
- c \*Nisun el m'a visto  
 Nobody he me has seen
- (72)a La mama la prepara el dolse  
 The mummy she prepares the cake
- b La mama la lo prepara  
 the mummy she it prepares

In (71) the subject clitic l cannot be present if an object clitic is present. This fact holds independently on the person of the object clitic. (72), on the contrary, shows that a subject clitic that appears with a main verb is allowed to cooccur with an object clitic. Again, this does not seem to vary changing the person of the object clitic.

This distribution seems at first sight quite strange: why should a subject clitic be ungrammatical if an object clitic is present? This seems to suggest that they occupy the same position, or that they have the same function. However it is not clear at all in what sense a subject clitic and an object clitic should do the same work.

Another fact can help us to throw light on this intricate situation. In Venetian a clitic is always present only with auxiliaries, but it has the form of a locative clitic, not that of a subject:

- (73)a El ga magna`  
 He cl has spoken
- b \*El a magna`  
 He has spoken

Also in Venetian older speakers use the alternation of this

oblique clitic with other object clitics that we noted in examples (72):

(74)a El ga visto Nane  
He cl has seen John

b El m'a visto  
He me has seen

Summarizing the facts, we have found at least six tests that distinguish ASV from VSC:

- a) ASC are obligatory both with subject DPs and QPs, while this is not the case for VSC. (cfr Trentino in section 3.1)
- b) ASC often show a morphological distinction with respect to VSC, as in Valdotain.
- c) In some varieties ASC and VSC cooccur, as for instance in Piedmontese.
- d) ASC never invert in main interrogative contexts, while VSC must do so.
- e) In other varieties ASC alternate with object clitics (cfr. Northern Veneto).
- f) In some cases, ASC do not even have the form of subjects but that of a locative clitic (cfr. Central Veneto).

Considering these facts, we must assume that subject clitics that appear with auxiliaries must be something different from subject clitics that appear with other verbs. The fact that they are not even realized as subjects but as locatives in some varieties leads us to think that they are not true subject clitics, in the sense that they are not connected with the preverbal subject position or with the thematic subject position inside the VP. The presence of a clitic must be necessary in order to satisfy a

condition imposed by the auxiliary verb. Some dialects realize this clitic as a subject, some others as an object or even create a new special series only for auxiliaries.

The question now is: what is this mysterious condition imposed by the auxiliary?

An interesting possible solution has been proposed by Belletti (1991), who proposes the hypothesis that auxiliaries have an additional functional projection that main verbs do not use. She bases her proposal on the different order that adverbs show with main verbs on the one hand and auxiliaries on the other. In particular, she observes that: " the range of distributional possibilities is wider in sentences containing a complex tense, in which the adverb can also appear between the auxiliary and the past participle and not only at the beginning of the sentence:

(74)a Lui ha probabilmente sbagliato  
He has probably mistaken

b Maria ha evidentemente rivelato il segreto  
Mary has evidently told the secret

As (74a/b) (Belletti (1990) : (40)) show a sentence adverb appears between the auxiliary and the past participle.

As sentence adverb only adjoin to AgrP, Belletti assumes a recursion of AgrP in sentences like (74a/b). This additional AgrP has an empty head, to which only an auxiliary can move, as it is generally the case for movement to empty functional heads. Empty Agr heads in fact are available only to Auxiliaries both in English tensed sentences, and in French infinitival sentences, as Pollock (1989) has shown.

Within Pollock's analysis, this is so because the movement to a non-selected head are opaque to theta role assignment and block

the possibility that the verb trace under V to assign theta roles to its complements. Auxiliaries do not have theta roles to assign. So they can move through non selected movement to an empty head that blocks the transmission of the theta roles, because they have none to assign. Main verbs on the contrary cannot move to an empty position, because they would not be able to assign the theta role to the arguments they select.

On the basis of Belletti's proposal about an additional functional projection we will try to explain the distribution of ASC.

We can thus assume that in some NIDs the head of this additional projection is rendered visible by the presence of clitics, which can have the form of normal subject clitics, or of particular subject clitics or even of obliques. Subject clitics are not equivalent to verbal morphology, because they are not X-1 categories as verbal morphology is (cfr. Rizzi and Roberts (1989)), but complete heads. Therefore they do not select a verb as agreement morphology does. The position is thus still opaque to theta role assignment, exactly as in Standard Italian.

Hence, even when this additional AgrP is rendered visible by a clitic, it blocks theta role assignment. So, also in NIDs this additional position is only open to auxiliaries and not to main verbs.

If ASC are "place-holders" it does not matter which form they assume: they can be subject clitics or locative (recall that expletive subjects have in many languages the form of a locative).

Furthermore, they are not sensitive to the type of subject, DP or QP that is in its Spec position, because they do not enter in a chain with it. As ASC are a sort of expletive elements that signal the additional Agr position, they alternate with other clitics. As soon as there is another clitic that can be interpreted as filling that position, they can disappear.

In particular I will assume Roberts' (1991) proposal about the alternation between subject clitics and object clitics: Agr1 is an intrinsic clitic position, where no more than one clitic can be realized. Hence, when there is an object clitic, the ASC disappears. <fn.16>

In the next section we will examine a dialect in which the Agr1 position is not only a position for auxiliaries, but also for main verbs.

### 3.3 FRIULANO

Friulano is another North Eastern variety, which is analyzed in Vanelli (1987) in its Renaissance period as having only phonological subject clitics, like RVe and RFr.

It seems that subject clitics in this dialect have developed into another system which is different from both SVe and TR.

Modern Friulano (from now on FR) subject clitics seem to be obligatory in every context that we have examined here. Subject clitics are obligatory both with preverbal subject DPs and QPs (cfr. Beninca` and Vanelli (1984)) :

(76)a Toni al ven  
Toni he comes

b \*Toni ven  
Toni comes

- (77)a Qualchidun al ven  
Somebody he comes
- b \*Qualchidun ven  
Somebody eats here

They are obligatory even with postverbal subject DPs and QPs:

- (78)a Al ven Toni  
He comes Toni
- b \*Ven Toni  
Comes Toni
- (79)a Nol ven nisun  
Not+he comes nobody
- b \*No ven nisun  
Not comes nobody

They always cooccur with a subject wh trace:

- (80)a Cui vegnial?  
Who comes he?
- b \*Cui ven?  
Who comes?
- (81)a Il fantat ch'al ven  
The boy that he comes
- b \*Il fantat che ven  
The boy that comes
- (82)a MARIO al ven  
MARIO he comes
- b \*MARIO ven  
MARIO comes
- (83)a Al e` MARIO, ch'al ven  
It is MARIO that he comes
- b \*Al e` MARIO, ch' ven  
It is MARIO that comes

The distribution of subject clitics in FR (cfr, Beninca` and Vanelli (1984)) does not correspond to the S<sub>Ve</sub> system, in which subject clitics are pro licenser, because FR subject clitics do not alternate with subject DPs.

The system is not the same as that illustrated for TR either,

because in FR subject clitics always cooccur with subject QPs and with wh traces. Nevertheless subject clitics must have a function and this is probably connected to the head of Agr.

As Beninca and Vanelli (1984) noted subject clitics can alternate with object clitics or with the negative clitic.

A subject clitic must be omitted if there is an object clitic or a negative marker in Agr.

The data are complicated by the fact that they depend on the person of the verb: for the first person singular and plural and second person plural the subject clitic has to disappear if there is a negative marker or an object clitic:

- (84)a I ai capit  
I have understood
- b Lu ai capit  
It (I) have understood
- c \*I lu ai capit  
I it have understood
- d No ai capit  
Not (I) have understood
- e \*I no ai capit  
(I) not have understood
- f \*No i ai capit  
Not I have understood
- (85)a I vin capit  
We have understood
- b Lu vin capit
- c \*I lu vin capit
- d No vin capit
- e \*I no vin capit
- f \*No i vin capit

- (86)a I ves capit  
You+plur. have understood
- b Lu ves capit
- c \*I lu ves capit
- d No ves capit
- e \*I no ves capit
- f \*No i ves capit

In the case of the third person the subject clitic is optional when there is an object clitic and obligatory when there is a negative marker:

- (87)a Al viot la Maria  
He sees the Mary
- b Mi viot  
Me sees
- c Al mi viot  
He me sees
- (88)a Nol mange  
Not+he eats
- b \*No mange  
Not eats

The second person singular can never be omitted:

- (89)a Tu lu metis  
You it put
- b \*Lu metis  
It put
- (90)a No tu saludis nancie  
Not you say hello not
- b \*No saludis nancie  
Not say hello not

On the basis of this test we can distinguish two types of subject clitics in FR: subject clitics that alternate with object clitics, namely first person and second person plural subject clitics, and second person singular subject clitic, which do not

alternate with object clitics and with the negative clitic.

In the case of the third person the data are quite complicated: I will suggest that the optionality of the subject clitic when an object clitic is present is due to the fact that third person subject clitics can be interpreted as a clitic of the same type as second person singular or as a first person clitic.

Let's now concentrate our attention on FR subject clitics that alternate with object clitic. <fn.17> The phenomenon of alternation between subject clitics and object clitics has already been observed in section 3.2 for the case of ASC (Auxiliary subject clitics) in other NIDs.

On the basis of this test we could assume that FR subject clitics are equivalent to ASC of other NIDs. In section 3.2 six different tests have been presented in order to differentiate ASC from VSC. If the claim that FR subject clitics are equivalent to ASC of other NIDs is correct, also these tests should give a positive response. As ASC, FR subject clitics are obligatory with every kind of subject: the examples (76)-(83) show that subject clitics appear with subject DPs, QPs or even wh traces. Hence they cannot be coindexed with the SpecAgr position, otherwise they would yield an improper chain in which a variable is bound by a pronominal element and cannot be interpreted by its operator in A'position. We can conclude that FR subject clitics are not coindexed with the SpecAgr position just like ASC.

In some varieties ASC cooccur with VSC, (for instance in Piedmontese). This is true also for some FR varieties, as for instance the dialect of Casarsa, but the double clitic appears

with all verbs, not only with auxiliaries (cfr. Benincà (1984)):

- (91)a A nol ven  
    Cl not cl comes
- b Tu i ti ciantis  
       You cl cl sing

Moreover in Valdotain the ASC remain at the left of the auxiliary in main interrogatives, while the VSC adjoins at the right of the Auxiliary:

- (92) L'est+e prest?  
      Cl is+cl ready

This is true also for FR subject clitics, and the phenomenon is extended to all verbs:

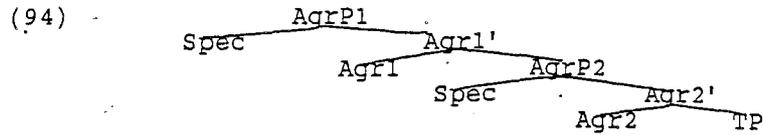
- (93)a A ciantial?  
      Cl sings cl?

Summarizing the data: FR subject clitics alternate with object clitics, they are obligatory with every type of subject DP, they can duplicate, and in this case they remain at the left of the verb even in main interrogatives. We can thus assume that FR subject clitics are parallel to ASC of other NIDs. From an intuitive point of view, it seems that FR has extended a mechanism that is already exploited in a more restricted area in other dialects. We are now faced with the problem of translating this observation into structural terms.

In section 3.2 we mentioned Belletti's hypothesis that auxiliaries have an additional functional projection with respect to other verbs, and that clitics occupy just this position.

A similar conclusion has been reached by Cardinaletti and Roberts (1991) who assume a second AgrP projection in various languages (as in German, Icelandic and RFr) which is the landing site of

clitics.



Let's try to explain the FR data on the basis of a structure like (94) and on the basis of the assumption that the Agr1 position has always to be phonetically filled by a clitic. In section 3.2 we assumed Belletti's hypothesis that only auxiliaries move to a higher Agr projection, a claim that explains the different order that adverbs present in compound tenses and the fact that ASC in NIDs alternate with object clitics.

As FR subject clitics behave as ASC with all main verbs, it seems plausible to assume that all verbs in FR move to the higher Agr head, and not only auxiliaries. In other words, the additional Agr projection is not opaque to the transmission of the theta roles in FR. The difference between FR and other NIDs is the same difference observed between French and English Agreement: in one language the position is transparent to the theta role assignment, in the other it is opaque. In FR therefore, all verbs move to Agr1. This explains the similarity between FR subject clitics and ASC of other dialects.

The difference between NIDs and FR is now clear: in FR all verbs move to a higher position, which is accessible only to auxiliaries in other varieties.

#### 4. CONCLUSION

The status and the distribution of subject clitics in Northern Italian Dialects is connected to, at least, three components of

the grammar: the pro drop parameter, the Case assignment conditions, and the visibility of empty Agreement heads.

It is possible to summarize the entire discussion about the development of subject clitics making a quite simple hypothesis regarding the relation between verbal morphology and subject clitics.

In standard French subject clitics have remained true subjects, which appear in the SpecAgr position like other subject DPs. On the contrary, in all Northern Italian dialects subject clitics have been reinterpreted as a possible candidate to substitute agreement in various syntactic mechanisms. In all these cases the function of agreement, both intended as a syntactic position and as morphological specification, is to identify the subject of a predicate. Subject clitics, starting as true subjects have slowly been reanalyzed as heads that interfere in the strict relation between the head and the Spec of Agreement. In SVE, for instance, subject clitics mimic the relation of Spec-head Agreement that Agr has with the subject adjoining to the head and licensing a pro in the SpecAgr position. In modern Trentino the situation is reversed, subject clitics do not take the place of the subject DP, but is the nominative Case morpheme itself. In Friulano a subject clitic is so similar to Agr that it can occupy an additional Agr position itself, to which the verb is attracted as it is by verbal morphology. The subject clitic constitutes thus a new type of agreement morphology following Renzi and Vanelli's generalization that the subject features must be encoded at least in one of the two elements, but can also be

encoded on both.

#### FOOTNOTES

\* Thanks are due to A. Battye, A. Belletti, G. Cinque, T. Guasti, I. Roberts, L. Rizzi, A. Tomaselli, R. Zanuttini, and in particular P. Benincà and L. Vanelli for comments and discussion. All errors are naturally my own.

1. The term "agreement" is ambiguous, because it indicates both the inflectional morpheme and its structural position as head of AgrP. I will refer to the syntactic position of Agreement using the capital letter and to the morpheme as agreement in small letters.

2. Not all subject clitics appear at the right of the preverbal negative marker. For a detailed analysis see Poletto (1991a)

3. Cfr. 3.2 for sentence with compound tenses, that have a different series of subject clitics from sentences with simple tenses

4. The Veneto variety used for the examples is the dialect of Oderzo.

5. We use here the second person singular subject clitic, which behaves as the l clitic.

6. We will use examples from plays by Ruzante for the Paduan variety and from a letter collection by Calmo for the Venetian

variety. There are only some minor morphological distinctions between the two. In (16) the first form is the Paduan, the second corresponds to Venetian.

7. Ca seems to be a specialized form for the comparative complementizer which is found only in Venetian texts.

8. Subject clitics are still arguments also in Modern Veneto. They have lost their status of XPs, and are heads just like object clitics, but they never cooccur with subject QPs or subject variables neither in preverbal nor in postverbal subject position.

9. The pro drop system of the Renaissance French and Veneto is different from the Medioeval system. In their Medioeval stage, these languages were V2. Pro drop was licensed by the verb in C, hence possible only in matrix V2 clauses. In the Renaissance period, French and NIDs have lost Verb Second, but the licensing of pro still comes from the C head. As the verb does not move anymore into C, this must be marked with a particular feature in order to be visible. Agr can only take up the function of pro licenser if it is morphologically strong.

10. The theory that we propose here cannot be applied to modern NIDs as it is formulated, here. NIDs subject clitics are infact heads, and it is not obvious that they need to be independently Case marked. We will not discuss the phenomenon of Quirky

Agreement (cfr. Battye (1990)) in modern NIDs here (cfr. Poletto in preparation)

11. We are not considering here the cases of clitic doubling, which are quite frequent in NIDs, but only with indirect object clitics.

12. From the diachronic point of view, it seems quite reasonable to admit that the change in the structure must happen by means of ambiguous strings of words (cfr. Lightfoot (1978) and Roberts (1990)) that give raise to a possibility of "misunderstanding" the structure of the sentence. This is surely not the only reason for the diachronic change, because there must be some parametric choices that "push" a language into a precise direction.

Anyway, the structures presented in (44) and (45) present just the case of ambiguity that seems to be implied in the reanalysis of a structure. For instance a sentence like (i) can be interpreted as having the structure (44) or (45):

(i) El vien  
He comes

This ambiguity must have been the "bridge" which permitted the reanalysis from (45) to (44)

13. It is interesting to note that there seems to exist a relation of mutual exclusion between nominative Case assignment thorough Governement from Agr and nominative Case assignment through Government from T.

English, for instance, is a language that does not permit free inversion of the subject. Hence, following the parameter in (34) it does not select T as a possible nominative Case assigner. Nevertheless, in main interrogative sentences, Agr can assign nominative to the subject DP in SpecAgr, as in (i):

(i) What has John done?

Romance languages, on the contrary, select T as possible Case assigner, but do not permit nominative Case assigned by Agr in a sentence like (i):

(ii) \*Qui a Jean vu?  
Who has John seen?

So, we can observe, that a language can exploit a nominative Case assignment configuration only once: if the subject gets nominative form T, it cannot get it from Agr under the same type of Configuration. This could be valid not only for Government, but also for Spec-head Agreement.

14. Subject clitics never appear when the subject is the variable left by wh movement. We assume here Rizzi's (1982) hypothesis that variables always occupy the postverbal subject position and never the preverbal one. Hence, subject variables, like postverbal DPs, receive Case from T and not from Agr. This is the reason why subject clitics are not present: they are the Case morpheme for the Agr-nominative, and not for the T-nominative Case assignment.

15. This happens also in Valdostain as noted by Roberts (1991)

16. For a detailed discussion on the alternation between subject and object clitics see Roberts (1991) section 3.

17. The fact that the second person singular behaves differently from other persons is not surprising. Second person singular subject clitics are different from other clitics also in other varieties (cfr. Poletto (1991a) for a detailed analysis)

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**On The Structure of Deverbal Compounds**

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On the Structure of Deverbal Compounds\*  
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1. Introduction

Deverbal compounds are syntactically opaque, as is generally the case for branching X<sub>o</sub>'s. They do not contain referential elements, their parts are not subject to extraction, coordination and anaphora. To this extent they differ from XP's.

In this paper, we will pursue the hypothesis that deverbal compounds are nevertheless subject to the principles and parameters of the grammar which apply to XP's, and consider the following questions with respect to their structure.

- i) Where is the head?
- ii) How is the non-head related to the head?
- iii) Why does the non-head precede the head in English while it follows in Italian?

We will focus on the similarities and differences between Italian and English deverbal compounds, and propose the following. Pro is the head of a typical Italian deverbal compound, while the suffix is the head of a typical English deverbal compound. In English the head is final; in Italian, it is final only in suffixless deverbal compounds. Furthermore, the non-head is distinctively an argument or an adjunct of the head. Moreover, in English, V movement occurs and the non-head precedes the head, this is not the case in Italian.

The following conclusions will be suggested with respect to the applicability of the principles and parameters of the grammar to the structure of X<sub>o</sub>'s.

- i) Theta theory applies to X<sub>o</sub>'s if the parts of the structures allows it.
- ii) Pro is licensed in X<sub>o</sub>'s if it can be licensed and identified in XP's.
- iii) Head movement in X<sub>o</sub>'s is restricted by independently motivated conditions.

This paper is organized as follows. In section 2, we present basic facts about the form and interpretation of deverbal compounds from Italian and English. In section 3, we focus on the presence vs the absence of a suffix in the structure. In section 4, we consider the consequences of the hypothesis that pro is licensed in Italian deverbal compounds and that it plays the same role as the suffix -er in English. In section 5, we propose that V movement occurs in the structure of deverbal compounds under certain

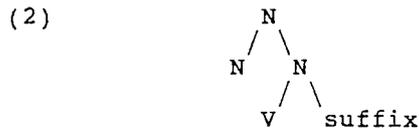
conditions. In the last section, we relate our analysis to the initial stage of the acquisition of deverbal compounds by the child exposed to either Italian or English.

## 2. Facts

Let us first start by noting that the category of the root (N) is not the category of the predicative head (V) in the structure of a typical Italian deverbal compound such as cava-tappi (opener) or apri-porta (door-opener), which could be as in (1).



In the structure of a typical English deverbal compound, such as time-saver or bike-rider, tentatively, the structure in (2), the category of the root is not the category of the predicative head either.



Moreover, the relation of the non-head to the predicative head seems to be the same whether the compound comes from Italian or English. The enclosed noun seems to bear an object relation with respect to the verb in compounds such as the ones mentioned above. However, this parallelism is not captured by (1) and (2). A proper analysis of deverbal compounds would have to include more abstract representations than (1) and (2).

Secondly, in a typical Italian deverbal compound, no suffix is present and the noun follows the verb, as in (3a). In a typical English deverbal compound, a suffix is present and the noun precedes the verb, as in (3b). Furthermore, both languages exclude productive compounding of the form (3c) and (3d), eventhough compounds such as ski-jump and controllo-passaporti (passport-control) are possible.

- (3) a. [V N]N      b. [N V-suffix]N  
       c. [N V]N      d. [V-suffix N]N

The difference in word-order between Italian and English deverbal compounds (3a,b) is independent of aspectual and argument properties of the compound, which may denote a complex event (controllo-passaporti, passport-control) or a concrete noun (apri-porta, door-opener), it may or not license a by-phrase or control by a rationale

clause. A proper analysis of deverbal compounds should be able to capture this fact.

Thirdly, in both languages the non-head may be interpreted as the internal argument of the head, as in (4a,b) or as an adjunct of the head, as in (4c,d,). However, in typical Italian and English deverbal compounds, the non-head cannot be interpreted as the causer (4e,f) or as the location (4g,h)<sup>1</sup>.

- (4) a. un mangia-nastro
- b. a tape-recorder
- c. una proposta-DC
- d. a DC-proposal
- e. un uccidi-zanzare
- f. a mosquito-killer
- g. un mette-scaffali
- h. a shelf-putter

These facts can be given a systematic account within GB Theory, if we assume that the principles and the parameters of the grammar apply to the structure of Xo's.

### 3. Arguments

To account for the similarity between Italian and English deverbal compounds with respect to their interpretation, let us assume the following hypothesis.

- (5) Theta-theory applies in Xo's.

Arguments are licensed in XP's by a theta-marking head under government (Chomsky 1986a), and languages differ with respect to the directionality of theta-role assignment (Travis 1984, Koopman 1984). Moreover the Theta-criterion applies to XP's and excludes defective structures with respect to theta-marking.

According to (5), arguments may also be licensed in Xo's, and Xo structures are subject to the Theta-criterion. This is the case for deverbal compounds, as proposed in Mead (1989) for English and in Di Sciullo (1991) for Italian.<sup>2</sup>

It can be objected however, that arguments are excluded from the structure of Xo's given that Xo's are syntactic atoms.

It has been argued (Giorgi and Longobardi (1991) (G&L) and elsewhere) that arguments are excluded from compounds for the following reasons. First, the internal noun does not induce the same truth value as a referential DP in object position. Hence, (6b) and not (6a) is a contradiction. Secondly, the noun included in the compound does not bind any A-position, comparable to a regular internal argument. Thus the difference between (7b) and (7c). Thirdly, it can be doubled, as in (8), and if it is the case that the genitive phrase discharges the internal argument

(Higginbotham 1985), the noun included in the compound cannot be licensed by theta-marking.

- (6) a. John is a Nixon-hater, but he does not hate Nixon.  
b. John is a hater of Nixon, but he does not hate Nixon.
- (7) a. the informers of a person about himself  
b. a person's informers about himself  
c.\*person-informers about himself
- (8) a. the bar-tender of Bill's bar  
b. il capostazione della stazione Termini

However, these facts can be accounted for otherwise. If we assume that compounds are Xo's and that D is excluded from Xo's structures (Di Sciullo 1991). Thus, the noun included in a deverbal compound has no reference and it cannot form a referential chain with an element outside. This accounts for (6) and (7). Moreover, there is a difference in the acceptability of the doubled phrases in (9), indicating that they are not arguments in the usual sense. The doubled phrase acts more like a modifier than an argument to the extent that it restricts the reference of the compound, in (9b) and (9d), the doubled phrase specifies the location. Similarly, (9e) is odd if the location of the station is not known otherwise, it is acceptable only if station is used deictically.

Furthermore, it is not clear that the genitive phrase discharges the internal argument, since they can occur with verbs such as be/essere which do not select arguments, as in (10). If this is the case, structures such as (8) should be accounted for otherwise, the doubled phrase being the modifier of the compound.

- (9) a.\*John is the dish-washer of the dishes.  
b. John is the dish-washer of the cantina.  
c.\*John is the piano-player of the piano.  
d. John is the piano-player of Bill's bar.  
e.\*Il capostazione della stazione  
'The station master of the station of the Termini station'  
f. Il capostazione della stazione Termini  
'The station master of the Termini station'
- (10) a. This book is John's.  
b. Questo libro è di Gianni.

Eventhough the noun enclosed in a compound lacks the reference a DP has, we will assume that it can be an argument, and that the difference between being an argument in XPs and being an argument in Xo, follows from the exclusion of D from the structure of Xo's.

We will thus assume that the non-head can be an argument of the head in a deverbal compound. Let us look at English and Italian in this perspective and determine when an argument-head relation may hold in these structures.

### 3.1. Arguments and adjuncts

#### 3.1.1. English

According to Roeper (1987), an argument-head relation can be obtained in English deverbal compounds if a suffix is present. Without the presence of a suffix, no argument-head relation may hold. For instance, ball-throw is different from ball-throwing in the admissibility of a by-phrase and control by a rationale clause, which are taken to indicate the presence of implicit arguments.

- (11) a. the ball-throwing (by Mary) (to impress the audience)
- b. the ball-thrower (\*by Mary) (\*to impress the audience)
- c. the ball-throw (\*by Mary) (\*to impress the audience)

Let us point out that the presence of a suffix is not sufficient to determine if an argument-head relation holds in the structure. Assuming that the noun enclosed in the compound satisfies the selectional properties that the verb imposes on its internal argument (women-strangler vs Boston-strangler), it is the nature of the suffixal head which is determinant. For instance, the presence of the suffix -er, as in (trouble-maker) exclude the licensing of by-phrases and control, whereas the presence of the suffix -ed, as in (expert-tested) allows the occurrence of by-phrases and control.

Moreover, by-phrases and control may be excluded for different reasons. In (11b), the external argument of the base verb is saturated inside by the suffix -er, thus this position is no longer available in the syntax. In (11c), the base predicate is not argument-taking, it is a result noun, thus no agentive by-phrase can be licensed in the syntax.

The facts in (12), indicate that in compounds such as (11c) the non-head is not an argument of the head. Compounds such as (12a), with a verbal head, are excluded, whereas the ones in (12c), with a nominal head, are perfect.

- (12) a. \*the pasta-eat, \*the book-read, \*the girl-watch
- b. \*the eat, \*the read, \*the watch
- c. the weather-report, the ball-play, the car-ride
- d. the report, the play, the ride

If this is so, we may exclude argument-head [N V]N compounds in English. What looks like [N V]N compounds are in fact [N N]N compounds, and the relation of the non-head to the the head is not argumental. Consequently, the exclusion of a by-phrase in (12c) is, in effect, due to the fact that the head is not argument-taking.

This leads us to conclude that an argument-head relation may hold within English deverbal compounds when a suffix is present, it may not otherwise. Moreover, the admissibility of a by-phrase and control is not sufficient to determine if this relation holds or not. The determinant factors are the inherent properties of the affixal head.

This leads us to reformulate (5) as (13).

- (13) Theta-theory applies in Xo's if the parts of the structures allows it.

On consequence of (13) is that it captures the fact that the properties of the suffixal head in the structure of a deverbal compound determine the properties of the whole, as is the case, more generally, for heads (Williams 1981, Di Sciullo and Williams 1987).

### 3.1.2 Italian

In Italian, deverbal compounds are generally suffixless, eventhough there are forms such as controllo-passaporti, pointed out to me by S. Scalise (p.c.). Eventhough suffixed deverbal compounds can be coined productively in some registers, they are not typical. So, for instance, (14a) is perfect, whereas (14b) is excluded, (14c) being preferred.

- (14) a. un mangia-pasta  
       'a pasta-eater'  
       b. \*un mangiatore-pasta  
       'a pasta-eater'  
       c. un mangiatore di pasta  
       'an eater of pasta'

There are interesting differences between suffixless and suffixed deverbal compounds, which we point out immediately.

First, by-phrases and control by a rationale clause may not be licensed by the first sort of compound, whereas they can be by the second sort (depending on the properties of the suffix).

- (15) a. un mangia-pasta (\*da parte di Gianni)  
       'an eat-pasta (\*by Gianni)'  
       b. un mangia-pasta (\*per impressionare la folla)  
       'an eat-pasta (\*to impress the crowd)'

- (16) a. il controllo-passaporti (da parte della  
polizia)  
'the control-passports (by the police)'  
b. il controllo-passaporti (per identificare  
l'assassino)  
'the control-passports (to identify the  
murderer)'
- (17) a. il distributore-Pepsi (\*da parte del  
ragazzo)  
'the distributer-Pepsi (by the kid)'  
b. il distributore-Pepsi (\*per calmare il  
ragazzo)  
'the distributer-Pepsi (to calm the kid)'

The exclusion of *by*-phrases and control in (15) and (17) indicate that all the arguments of the base verb have been saturated inside the compound, as evidenced in Di Sciullo (in press). This is not the case for the compounds in (16).

Secondly, the non-head in a suffixed deverbal compounds may be interpreted as an agentive *by*-phrase. This is the case for suffixless deverbal compounds. If we construct a suffixless compound equivalent to (18a), say (18c), the non-head may only be interpreted as the internal argument of the verb, as in (18d); it cannot be interpreted agentively as in (18a,b).

- (18) a. una proposta-DC,  
a proposal-DC  
'a DC-proposal'  
b. una proposta da parte dalla DC  
'a proposal by the DC'  
c. un proponi-DC  
'a DC-proponer'  
d. un proponente della DC  
'a proponer of the DC'

Thirdly, while in both types of compounds, the non-head can be interpreted as the internal argument of the verb, only in suffixed compounds it can also restrict the reference of the derived nominal. This can be seen in the following examples. While both (20b) and (20c) are possible for (20a), only (19b) is for (19a).

- (19) a. il porta-bandiera  
'the flag-carrier'  
b. il porta(tore) di bandiera  
'the carrier of flag'  
c. #Il porta(tore) è una bandiera.  
'The carrier is a flag.'
- (20) a. la raccolta-rifiuti  
'the garbage-collect'

b. la raccolta di rifiuti  
'the collect of garbage'

c. La raccolta è un insieme di rifiuti.  
'The collect is a set of garbage.'

This can be accounted for if we assume that in suffixed deverbal compounds, such as (16a), (17a) and (18a), the non-head is both an argument of the head and an adjunct with respect to the derived nominal. The last part of the preceding statement is supported if we assume (Grimshaw 1990) that, contrary to verbs, nouns do not theta-mark. Thus, the non-head in a suffixed deverbal compound cannot be an argument with respect to the derived nominal, even though the directionality of the head-complement parameter would be satisfied directly here: the noun being to the right of the derived nominal in Italian structures.

Thus, while suffixless deverbal compounds may instantiate an argument-head relation, the presence of a suffix in an Italian deverbal compound is not a necessary condition for that relation to be obtained. The facts presented above indicate that the presence of a suffix may induce an adjunct-head relation.

### 3.2. Summary

In this section, we have considered the role of the suffix for determining the relation of the non-head to the head in a deverbal compound. English and Italian differ in this respect. The generalization is that the presence of a suffix is necessary for an argument-head relation to hold in English, whereas the absence of a suffix is in typical deverbal compounds in Italian.

## 4. Pro and suffixes

### 4.1. Italian

We provided evidence (Di Sciullo, in press) that suffix-less deverbal compounds in Italian are concrete (result) nouns. They exhibit all the syntactic properties of concrete (result) nouns with respect to the specifier and complement systems. The thematic arguments of their base verb must be saturated inside, given the assumption that non-relational concrete nouns do not have thematic arguments. We proposed that the internal argument of the base verb is saturated by the overt nominal category, sister to the verb and that the external argument is saturated by a c-commanding pro, which is the head of the structure. Suffixless deverbal compounds in Italian are complete functional complexes.

Let us further assume that pro has the following lexical properties. It is an empty nominal category, thus

[+N,-V]; it is a pronominal, thus [+pron,-ana] and it is a potential referential element, thus it has a non-thematic R argument, which we will take to be an aspectual property of concrete (result) nouns.

When pro is part of an X<sub>o</sub>, it lacks reference as well as Case. This follows, if we assume that both reference and Case can be obtained by the presence of functional categories, such as AGR, and that these categories are excluded from deverbal compounds.

Now, according to Rizzi (1986, 1990) there are formal licensing conditions for pro in Italian syntax. In Rizzi (1986), Pro is formally licensed in the syntax if it is governed and assigned Case (I (AGR) or V). In Rizzi (1990) an external pro is licensed by Spec-head agreement. Moreover, the content of pro must also be formally identified by a category, which does not necessarily coincide with the licenser, and which gives pro a content in terms of grammatical features. However, if I (AGR) is excluded from deverbal compounds, pro cannot be licensed by this category in Italian deverbal compounds.<sup>3</sup> Moreover, its content cannot be identified in terms of referential or grammatical features as is the case for syntactic pro. We propose that an external pro is licensed by theta-marking, which is a sub-case of head government, in typical Italian deverbal compounds. Let us assume (21).

(21) Pro is licensed in X<sub>o</sub>'s by theta-marking.

There are consequences to our proposal, which we point out in the following paragraphs.

First, we account for the fact that the external argument of the base verb, eventhough not saturated by an overt nominal expression, is not available for saturation outside. Agentive by-phrases are excluded with suffixless deverbal compounds.

Secondly, we derive the fact that these compounds are not complex event nouns (Grimshaw's 1990), eventhough they may include a complex event verb. That these compounds are generally concrete or result nouns and not complex event nouns follows from the properties of the pro head, whose inherent properties includes R.<sup>4</sup>

Thirdly, we predict that pro may occur internally in Italian deverbal compounds. In fact, structures such as (22) are well-formed, eventhough not productive in some dialects. Both the external and the internal arguments of the verb are saturated internally, as evidenced by the impossibility of di (of) phrases and da parte di (by) phrases.

- (22) a. Gianni è un mangia (\*di tutto/\*da parte di Maria).  
'Gianni is an eat (of everything/by Mary)'  
b. ?Questo è un apri (\*di tutto/\*da parte di Luca).  
'This is an open (of everything/by Mary).'

Fourthly, we expect the interpretation of the internal pro to be arbitrary/generic, as is the case for null objects in Italian syntax (cf. Rizzi 1986). This prediction is borne out. The derived nouns in (23a,b) are equivalent to the ones in (22a,b) where the arbitrary/generic interpretation of the internal argument of the base verb is expressed by tutto (everything).

- (23) a. Gianni é un mangia-tutto.  
       'Gianni is a big eater.'  
       b. ?Questo é un apri-tutto.  
       'This in an universal opener.'

Moreover, we predict than an expletive pro is banned from the structure of a deverbal compound, given that there is no subject position in the structure for this category. The structure of suffixless deverbal compounds do not include adjuncts or constituents external to the maximal projection of the head of the structure.

- (24) a. \*un piove  
       'a rain'  
       b. \*un nevica  
       'a snow'  
       c. \*un sembra  
       'a seem'

Furthermore, we expect pro to be able to alternate with overt material, such as argument saturating suffixes in suffixed deverbal compounds. In fact, structures such as distributore-Pepsi do exist in Italian.

However, the presence of pro in a deverbal compound is the default value in our analysis. Consequently, we also predict that there is no well-formed compound which is a complete functional complex and which includes an argument saturating suffix, such as -ore (-er), which saturates the external argument variable of a verb. As predicted, the compounds in (25) are excluded. The external argument variable of the base verb is saturated twice, by pro and by the suffix -ore. The general "Economy Principle" (Chomsky 1988) prevents -ore to resaturate the external argument, which is already saturated by pro.

- (25) a. \*un mangiatore-pasta  
       'an eater-pasta'  
       b. \*un portatore-bagagli  
       'a carrier-lugages'

Similarly structures such as (26c) are excluded because the internal argument which is saturated twice here, by the noun and by the suffix -to (-ee) which has the property of saturating the internal argument variable of the base verb.

- (26) a. un ricercato  
           'a researchee'  
       b. un (ri)cerca-guai  
           'a trouble maker'  
       c. \*un ricercato-guai  
           'a researchee-trouble'

These facts bring support to the hypothesis that Theta-theory is active in Italian deverbal compounds.

The compounds discussed above contrast with the suffixed ones. The latter are not complete functional complexes and pro is not present in their structure. We propose that pro is excluded in deverbal compounds instantiating an adjunct-head relation. This is the case for the compounds in (27), where a non argument-saturating suffix is part of the compound.<sup>5</sup>

- (27) a. il controllo-passaporti (da parte dalla  
           CIA)  
           'the passport-control (by the CIA)'  
       b. la raccolta-rifiuti (da parte dei  
           cittadini)  
           'the garbage-collect (by the citizens)'  
       c. l'evacuazione-passeggeri (da parte del  
           capitano)  
           'the passengers-exit (by the captain)'

The compounds in (27) may license a by-phrase, which indicates that the external argument of the base verb is not saturated inside. This is not the case for suffixless deverbal compounds which do not license agentive by-phrases.

Our analysis account for this difference as follows. The head of suffixless deverbal compounds is pro, which is a potential referential expression, specified for the non-thematic R. Thus, suffixless deverbal compounds cannot be complex event nouns since their head is not eventive. On the other hand, suffixes such as -ione are potential complex event suffixes, and the predicates they give rise to are generally eventive, thus argument taking, eventhough result predicates can also be obtained, this is the case for deverbal compounds such as (27) as well. Given that their suffixal head is eventive, we derive the fact that they are complex event compounds.

Moreover, if an adjunct-head relation holds between the derived nominal and the noun, as we suggested above, it follows that the position of the head of the whole compound is initial (the head being the derived nominal), as it is generally the case for adjunct-head compounds in Italian, such as root compounds.

The hypothesis that Theta-theory as well as the Theory of pro applies in Xo's allows us to account in a principled way for the properties of Italian deverbal compounds whether or not they include a suffix.

According to our proposal, pro is licensed in typical Italian deverbals by theta-marking. This possibility is available independently in the language, given that in Italian syntax an argument may be overt or null (under formal conditions). This is not the case for English. Thus, we formulate (21) as (28).

- (28) Pro is licensed in X<sub>o</sub>'s if it can be licensed and identified in X<sub>P</sub>'s.

#### 4.2. English

We provided evidence (cf. Di Sciullo in press) that -er deverbals in English are concrete (result) nouns even though their base verb is eventive. They are complete functional complexes as is the case for suffixless deverbals in Italian. In fact, the English suffix -er plays the same role as pro in typical Italian deverbals. This is not the case for other suffixes, such as -ing and -ed. Let us recall the facts.

-er deverbals inhibit all the properties of concrete nouns with respect to the admissibility of specifier, complements and aspectual modifiers, as well as with respect to predication. We attribute this to the specificity of the suffixal head which determines the properties of the whole compound. -er is a nominal suffix, it has an R argument, and it has the property of saturating the external argument variable of the verb that it selects.

- (29) a. The/an heart-breaker just came in.  
b. \*Heart-breaker by Mary can be dangerous.  
c. \*Here comes an heart-breaker of hearts.  
d. John is the/an heart-breaker  
e. \*John's constant/intentional heart-breaker upset Mary.

If, -er has the same role as pro in Italian deverbals, the external argument of the base verb cannot be saturated outside the compound. This prediction is borne out, as evidenced in (29b)

-er differs from other suffixes with respect to the possibility of argument saturation. This is why English deverbals are not always complete functional complexes, as in the case for typical Italian deverbals. So, for instance -ing deverbals are not. They differ from -er deverbals, because the properties of these suffixes are different. We proposed that the suffix -ing is a nominal category [+N, -V], that is has a non-thematic event argument E, and that contrarily to the suffix -er, it does not bind any argument of the predicative head that it joins to.

- (30) a. The/\*an heart-breaking John did not please Mary.

- b. Heart-breaking by Mary can be dangerous.
- c.\*John is the heart-breaking.
- d. John's constant/ intentional heart-breaking upset Mary.

The external argument of the base verb is not saturated inside the compound because it cannot be assigned to or identified with a category in the structure. -ing deverbals have the specifier and complement properties of complex event nominals. They allow only the definite determiner, cannot occur predicatively, can license a by-phrase corresponding to the Agent of the verbal head, allow Agent-oriented adjectives as well as aspectual modifiers. Being complex event nominals -ing deverbals must have thematic arguments to saturate in the syntax.

Moreover, -ed deverbals differ from both -er and -ing deverbals. We proposed that the noun included in -ed compound does not saturate any argument of the base verb, but is an adjunct. -ed deverbals can be used as verbs or adjectives. Furthermore, they allow by-phrases corresponding to the external argument of the base verb and they can occur in ADJ-N structures.

- (31) a. This programme was expert-tested by John.
- b. This behavior was society-approved by the Romans.
- c. Expert-tested programmes are safe.
- c. Society-unapproved behaviors are fun.
- (32) a.\*This expert was programme-tested by John.
- b.\*This society was behavior-approved.
- c.\*Programme-tested experts are safe.
- d.\*Behavior-unapproved societies are fun.

The argument structure properties of -ed compounds are derived from the properties of the suffix -ed, which can give rise to adjective as well as verbal passive participles. We propose that the inherent properties of this suffix include the following. It is a [+V] suffix: it maps a verb onto a verbal category. It does not saturate any argument variable of the base verb as -er does. However, it suspends the argument status of the external argument variable of the verb and it externalize the internal argument variable (cf Zubizarreta 1987). Thus, in -ed deverbals, the external argument of the verb is no longer available for saturation as such, and the noun cannot be the internal argument of the verb. It is an adjunct. Moreover, the suffix -ed has an inherent non-thematic event (E) or state (S) argument according to the categorial properties of the whole (V=Event or ADJ=State). The event properties of -ed deverbals allows them to license agent-oriented adverbs (intentionally,deliberately), as well

as aspectual modifiers (constant, frequent), when they are verbs, but not when they are adjectives, as evidenced in (33)

- (33) a. These programmes were  
intentionally/constantly expert-tested.  
b. \*This is an intentional/constant expert-  
tested programme..

Thus -ed deverbals compounds, instantiate adjunct-head relations since neither the internal nor the external argument of the base active verb is available for saturation inside. This is not the case for -er deverbals compounds and for suffixless deverbals compounds in Italian.

Without Theta Theory applying in Xo domains and the assumption that suffixes have aspectual as well as argumental and categorial properties which are projected into the structure, it would be impossible to provide a principled account of the properties of English deverbals compounds.

#### 4.3. Summary

We proposed that both the internal and the external argument of a verb can be saturated within a deverbals compound if the properties of the part of the compound allows it. Some deverbals compounds are complete functional complexes whereas others are not.

In English, a suffix must be present in the compound and in some cases (-er deverbals compounds) it can saturate the external argument variable of the verb, while in other cases it does not have this specification (-ing and -ed deverbals compounds).

In Italian, pro saturates the external argument variable of the base verb; as for the internal argument variable it is saturated internally by the overt nominal category. Argument-head deverbals compounds differ from adjunct-head compounds. We proposed that pro is excluded in the latter case and a non argument-saturating suffix is present.

In all cases, the argument structure of the whole is a function of the properties of the head of the compound. If the head is pro, the compound is a concrete (result) noun and it has no thematic argument to saturate outside. If the head of the compound is a suffix, the properties of the compound, concrete or eventive, is a function of the inherent properties of the suffix.

We conclude that Italian and English should be treated on a par with respect to the possibility of licensing of an argument-head or an adjunct-head relation in a deverbals compound. Moreover we established the conditions under which arguments and adjuncts can be licensed in deverbals compounds. These conditions are independent of the word

order distinguishing compounds from typologically different languages, which we discuss in the next section.

#### 5. N-V and V-N

English and Italian (and more generally Germanic and Romance) deverbal compounds differ in word order, and it would be desirable to account for this difference in a systematic way, appealing to a single parameter set differently in each language. Let us discuss two recent proposals before presenting our analysis.

##### 5.1. The Subject-head parameter

G&L propose to refine the parameter of directionality of theta-role assignment, and to distinguish the subject-head parameter, where subject stands for categories external to the maximal projection of a head (including adjuncts such as modifiers) from the head-comp parameter. According to G&L, the head-complement parameter is set to the right, while the subject-head parameter is to the right in Romance and to the left in Germanic. Their proposal covers a large set of constructions from Italian and English including compounds, which they analyse uniformly as modifier-head structures. From their analysis it follows that the noun precedes the head in English deverbal compounds, while it follows in Italian.

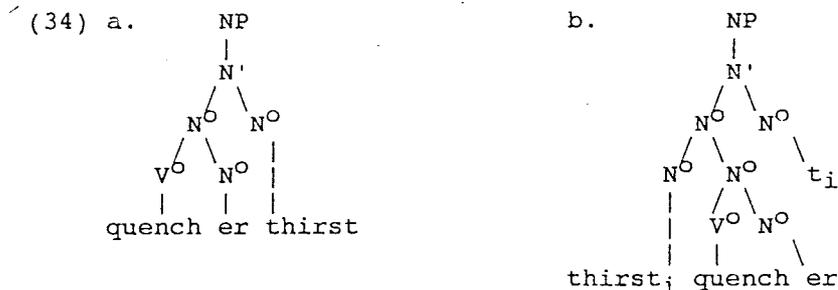
G&L's analysis is appealing since it provides a principled account for the difference in word-order between Romance and Germanic compounds. However, their analysis concerns mainly root compounds, and it if we are right in suggesting that there are deverbal compounds where the non-head is an argument and not a modifier of the head, the word-order difference would not follow in argument-head compounds. Romance and Germanic languages do not differ with respect to the directionality of the head-complement parameter. Moreover, it might be the case, as proposed in Cinque (1990), that modifiers precede in both Romance and Germanic. If this is the case, G&L's proposal would still not account for the facts.

##### 5.2. N movement

If the non-head can be an argument of the head of a deverbal compound, the difference in word-order between English and Italian deverbal compounds, and more generally Romance and Germanic, could be attributed to the presence or absence of N movement.

According to Lieber (1989), English deverbal compounds are derived by N movement to a pre-verbal position, as in (34) for thirst-quencher. The noun thirst is the complement of the deverbal noun quencher, the theta-role of quench is inherited by the derived nominal quencher, and it is assigned to the right. Moreover, given that Lieber assumes that Case can only be assigned to maximal projections, head-

movement into the Xo domain of the deverbal noun quencher is forced so that the Visibility Condition is not violated.



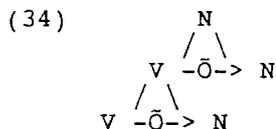
Lieber's analysis correctly accounts for the linear order of constituents in English deverbal compounds. However, in our view of the structure of Xo's, (34a) is not the right structure. The suffix -er, which saturates the external argument of the V does not c-command the No which saturates the internal argument of that V. Thus, (34a) is not a well-formed representation with respect to the projection of arguments in grammatical representations. In particular, it violates the requirement that the external argument of a predicate is the most prominent argument.

Moreover, the analysis cannot explain the difference between English and Italian. Given that these languages do not differ with respect to directionality of theta-role assignment for the head-complement parameter, we are left with no explanation as for why the complement precedes the V in English while it follows the V in Italian. Assuming for a moment that the No complement may move leftward, why must it move in English deverbal compounds and not in Italian?

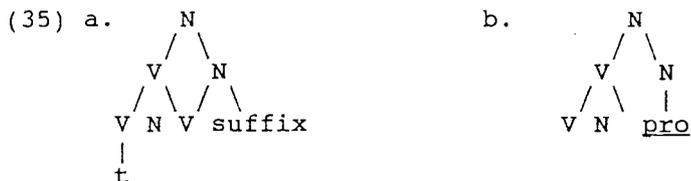
The difference between English and Italian could possibly be captured in Lieber's approach by stipulating that, contrary to English, in Italian the N complement is immediately dominated by No and not by N'. Thus, it would escape Visibility and remain in situ. However, this solution could not be motivated independently.

### 5.3. V movement vs pro

We propose that English and Italian argument-head deverbal compounds have the same basic structure, which represents the projection of the verb and its arguments. Basically, a structure where the external argument c-commands the V and its internal argument and where theta-role assignment is to the right, as in (34).



Crucially,  $V_0$  movement occurs in English but not in Italian, and pro is licensed in Italian and not in English, as in the following representations.



Our analysis account for the properties of typical English and Italian deverbal compounds. It captures their categorial and thematic similarities while it account for their difference in word-order.

Thus, eventhough deverbal compounds include a V, the root node is not a V, the category of the root is the category of the head, either a suffix or pro.<sup>6</sup> Moreover, in argument-head compounds, theta-role assignment is to the right in both English and Italian. The difference in word-order is due to the presence or absence of V movement. In English, the V moves to the c-commanding suffix, as in (35a). In Italian, the V does not move, given that pro and not a suffix is the head of the structure. Thus, in a typical deverbal compound the noun precedes the verb and a suffix is present, whereas in Italian the noun follows the verb and no suffix is present.

Our analysis account for the differences of word order in Italian and English deverbal compounds. We propose more complex representations for these compounds, including pro and t. Without these empty categories, it would be difficult to capture the similarities between compounds from typologically different languages as well as their word-order difference.

We propose that V movement in deverbal compounds is an instance of head-to-head movement applying in  $X_0$ 's. This movement occurs in order to satisfy the locality requirement imposed by an affix on the category it selects. (36) is a sub-case of the general adjacency requirement imposed by affixes on the category they select, and it holds in  $X_0$  as well as in  $XP$ 's.<sup>7</sup>

(36) A derivational suffix is a sister to the category it selects.

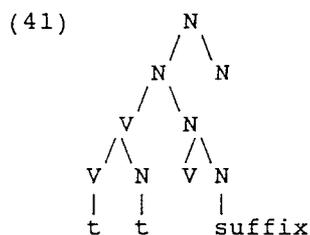
Our analysis excludes argument-head compounds in Italian where the noun precedes the verb and no suffix is present, such as \*quai-combina, by the directionality of the head-complement parameter.



Moreover, independent evidence for V movement in English is provided in Kayne (1991), which argues that it is licensed in the syntax by affixes such as negation, interrogative and imperative.<sup>8</sup>

Thus V movement is available in English as well as in Italian syntax (Pollock 1989). We propose here that it is also available in both languages in Xo's. In English, deverbal compounds include a suffix and V movement is forced by the general locality condition imposed by a suffix on the category it selects. In typical Italian deverbal compounds V movement does not occur because the compounds do not include an overt suffixal head, but pro. However, V movement must occur in the less typical structures with a suffix.

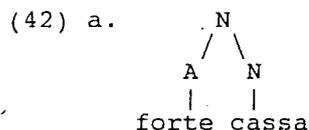
We suggested previously that in structures such as raccolta-rifiuti the non-head is an argument of the verb as well as an adjunct with respect to the derived nominal. We propose that their structure is as in (41), where the V is adjoined to the affixal head, given the adjacency condition (36), and where the N is adjoined to the root N, instantiating a non-ambiguous adjunct-head relation with the derived nominal. As a result, the head of the compound is correctly initial, as is the case for compounds instantiating an adjunct-head relation.



A motivation for adjunction to the root in Xo's, comes from Italian root compounds including adjectives, as we will see immediately.

In typical root compounds the head is initial and the non-head is not an argument of the head. Thus, the noun precedes de adjective in compounds such as cassa-forte (safe).

According to Cinque (1990), adjectival modifiers are external to the maximal projection of a nominal head and they are generated to the left of the maximal projection of that head. We will assume here that they are generated pre-nominally in [N A]N compounds as well, as in (42a) and that the surface order is derived by N movement to the root, as in (42b). Head movement is motivated here by the fact that root compounds are adjunct-head structures and that adjunctions structures can be derived independently by movement to a maximal projection. In (42a), it is the root N which is the maximal projection of the structure.

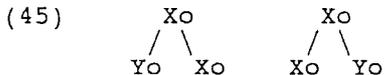


In (42b) the noun is adjoined to the root node, creating an unambiguous adjunction structure. We propose that this movement is forced by the general requirement that the elements of a structure must be R-distinct.

(43) R-distinctiveness:  
 In the structures C[A B], where A, B are sister nodes  
 A and B must be R-distinct.

(44) A and B are R-distinct iff  
 the relation between A and B is either  
 i) an argument-head relation, or  
 ii) an adjunct-head relation.

Let us think of Xo structures, as well as XP's as non-ambiguous argument-head or adjunct-head relations, minimally represented as in (45).<sup>9</sup> Argument-head structures differ from adjunct-head structures if theta-marking occurs or not between the head and the non-head.



The elements in (42a) are not R-distinct. This structure can either instantiate an adjunct-head relation or an argument-head relation. If we consider only the categorial structure, the N is the head, given that the whole structure is a N. However, this position of the head is specific to affixed forms instantiating an argument-head relation in Italian, as in formale-ità, as well as in deverbal compounds with a pro head. However, (42a) is not an argument-head relation given that the N does not select the A. Rather, it instantiates an adjunct-head relation. The adjunction of No to the root node in (42b) creates an unambiguous adjunct structure, where the position of the head fares with the position of the head in adjunct-head compounds in Italian. In (42b), the head of the structure is initial, and the noun precedes the adjective. The correct result. Let us reformulate (39) as (46).

(46) Head movement in Xo's is restricted  
 by independently motivated conditions.

Thus, under the present view, head movement may occur in Xo's independently of the relation holding between the non-head to the head. We proposed that it occurs in order to satisfy R-distinctiveness, or to meet the locality restriction imposed by an affix on the category it selects. Both conditions hold independently in XP's.

On the other hand, Italian root compounds such as [N N]N (uomo-elefante/elephant-man), [A A]N (rosso-blu/blu-red) and [V V]N (sali-scendi) do not trigger adjunction to the root node, given that they instantiate R-distinct relations. There is no theta-marking relation between the parts of the compound. Moreover, English root compounds such as hard-hat and white-house do not require movement either. Such structures are not ambiguous. The directionality of adjectival modification is rightward in English thus the head is final, and there is no theta-marking from the head to the non-head.

Italian suffixed deverbal compound and non categorially distinct root compounds constitute empirical evidence for the adjunction of a category to the root in Xo structures.

### 5.3. Summary

The difference in word-order between Italian and English deverbal compounds is not due to a difference in the directionality of theta-role assignment for the head-complement parameter, but rather depends on the admissibility of pro. If pro cannot be licensed, as is the case in English, a suffix is present, then the locality requirement imposed by the suffix on the category it selects triggers V movement. If there is no suffix, as is typical in Italian deverbal compounds, pro is present and no V movement is required.<sup>10</sup> Finally, we proposed for the less typical suffixed compound of Italian, as well as for a sub-class of root compounds, that N movement occurs to meet R-distinctiveness.

### 6. Acquisition

In this paper we pursued the hypothesis that the parametrized principles of the grammar apply in Xo's as well as in XP's.

We proposed that pro was part of the structure of argument-head deverbal compounds if the language could license and identify pro independently, as is the case for Italian. Pro was excluded from English deverbal compounds, given that this language could not independently license and identify such a category.

Moreover, we proposed that disregarding the word-order difference, Italian and English shared a unique base structure for deverbal compounds.

Our analysis captures the fact that the first stage in the acquisition of deverbal compounds by the child exposed to English is V-N, as reported in Clark and Al. (1986). It is also V-N for the child exposed to Italian, as reported by Loduca (1988).

- (47) a. drive-car (first stage) for 'driver'  
b. cutter-glass (second stage)  
c. glass-cutter (third stage)

This brings support to our hypothesis that English and Italian should be treated on a par with respect to the base structure of deverbal compounds.

## 7. Conclusion

This paper provides an account for the properties of deverbal compounds of English and Italian and show how they follow from the Theory. Moreover, the word-order difference between Italian and English deverbal compounds reduces to an independent parameter, the admissibility of pro. As a result, predictions can be made with respect to the form of deverbal compounds in different types of languages within a unified account of their categorial and argument properties. Moreover, we suggested that the principles of the grammar, in particular Theta theory and the Theory of pro covered XP's as well as Xo's. The application of the principles to Xo's being restricted by the set of categories admissible in these structures.

## NOTES

\*.Some aspects of this paper were presented at WECOL 20, at the University of El Paso in October 1990, at the Primer Coloquio de Gramática Generativa at Miraflores de la Sierra in March and at the Seminario di Linguistica at the Università degli Studi di Venezia in May 1991. Many thanks to the members of the Seminario di Linguistica, as well as to the members of the Argument Structure Project at the Université du Québec à Montréal for discussion. This work was supported by a grant from the Social Sciences and Humanities Research Council of Canada (#410-88-0624).

1.The exclusion of causers and locations from deverbal compounds may be related to the absence of AGR and TENSE in these structures. We will not elaborate this hypothesis here.

2. Note that the principle and parameter approach differs from traditional analysis of English deverbal compounds which included language specific constraints such as the First Sister Principle (Roeper and Siegel 1978), the First Order Projection Condition (Selkirk 1982), The Argument Linking Principle (Lieber 1983), and the Constraint on the Projection Principle (Sproat 1985). These constraints ensured that, in English deverbal compounds, the internal argument and not the external argument of the base verb is included inside.

There are theoretical as well as empirical problems with the inclusion of these constraints in the grammar. Firstly, as is well known, language-specific constraints are undesirable in the grammar of individual languages given that they impose a further burden on the language learner. Secondly, that different languages, in fact typologically different languages, do not differ with respect to the restrictions on the interpretation of deverbal compounds strongly suggest that these properties are due to the principles of the grammar. Thirdly, the constraints incorrectly predict that deverbal compounds with ergatives are well-formed in all cases. This is not so. In English, the nature of the suffixal head is determinant (\*student-arriving vs student-arrival). In this respect, Grimshaw's (1991) proposal to exclude compounds with monadic predicated by the requirement that a predicate must have an open position to saturate in the syntax also fails to account for the facts.

If, as we suggest, deverbal compounds are subject to the parametrized principles of the grammar, language specific constraints can be dispensed with.

3. In Di Sciullo (1991), we proposed that the Principles of the grammar apply in XP as well as in X<sub>0</sub> domains, wherever their conditions of application are met. So for instance, assuming that empty categories may occur in X<sub>0</sub> domains, their licensing conditions are not necessarily coextensive with the syntactic licensing conditions for these categories. There are reasons to believe that ECP applies vacuously in X<sub>0</sub>, as well as the formal licensing conditions for pro by Case assignment.

4. It could be objected, however, that compounds such as (i) are not concrete nouns, as is the case for alza-bandiera and scende-bandiera, pointed out to me by Antonietta Bisetto (p.c). In fact, these compounds are not complex event nouns, since, they allow both definite and indefinite determiners and may occur predicatively, which is not the case for complex event nominals. They are simple event nouns as is the case for the noun event.

- (i) Questo è un bellissimo alza-bandiera.
- (ii) \*l'alza-bandiera da parte del soldato
- (iii) Questo è un bellissimo evento.
- (iv) \*l'evento da parte del soldato

5. We will assume that suffixes such as -ione do not saturate an argument position of the base verb, rather they suspend the syntactic argument status of the external argument. The latter can only be projected as an adjunct. (cf. Zubizarreta 1987, Grimshaw 1991).

6. In (i), which is the structure of a typical Italian deverbal compound, it is the categorial features of pro that projects to the top node, and, as a result, the whole structure is a N. The N may project to NP, a maximal projection in the syntax, if it is selected by D. On the other hand, if the V is selected as the categorial head, it gives rise to the structure in (ii), where the top V may project to VP, a maximal projection in the syntax, if it is selected by I.



7. Note that Vo movement in (42) is not verb incorporation (cf. Baker 1987). The Vo does not adjoin to another Vo.

Moreover, the syntactic conditions on head-to-head movement apply vacuously in that structure. There is no barrier (a non-theta-marked maximal projection, as in Chomsky 1986b) between the antecedent and its trace to block proper government. Assuming that I is excluded from Xo domains (cf. Di Sciullo 1991), a VP cannot be licensed in these structures since there is no functional category to select it.

8. Further independent motivations for V movement in English come from Larson's analysis of double object constructions. Moreover, head-to-head movement may apply in the lexicon, as suggested by Hale (1990). Interestingly, the set of constructions

which covers both lexical head-to-head movement in English, as well as the syntactic instantiation of verb movement in English, basically double objects constructions are not found in Italian.

Furthermore, our analysis is compatible with Cinque (1991) proposal concerning stress patterns in English compounds. Basically he shows that construction-specific rule for stress assignment can be eliminated. Assuming Hale and Vergnaud (1987) theory, Cinque suggests that it is the more embedded constituent which bears the primary stress in English compounds.

9. We do not use X' Theory notation to distinguish the head from the non-head in Xo's, as in Selkirk (1982) and elsewhere. See Lieber (1989) and in Di Sciullo (in preparation) for discussion. However, we assume that X'

Theory does apply in Xo's to the extent that the structure of Xo's includes head, complements and probably specifiers.

10. Our proposal can be extended to cover all Romance languages including French, which is generally assumed not to be pro-drop. In French, however, [[V N] pro]N compounds are less productive than in the other pro-drop romance languages. Thus new compounds of this form cannot be created freely, as is the case in Italian and in Spanish for instance: in French un mange-pâtes is unnatural. It might be the case that [[V N]pro]N compounds were formed productively when French was pro-drop, and that they remained in the language. We will not discuss this matter in more detail here.

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**Partitive ne and The QP-Hypothesis.  
A Case Study**

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**PARTITIVE ne AND THE QP-HYPOTHESIS. A CASE STUDY.\***

**1. Introduction**

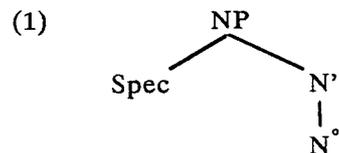
Although the syntax of the Italian clitic ne has received much attention in the generative literature (cf. Belletti and Rizzi (1981) and Burzio (1986) among others), it still represents a challenging topic of research, for a great number of questions have either remained unanswered or have not been raised at all. In this study we will focus on partitive ne and in particular on two closely related issues: the first concerning the internal structure of quantified nominals, the second concerning the categorial status of the empty category linked to ne in partitive constructions.

Belletti and Rizzi's analysis of ne as an N', which is still assumed in current literature, is unsatisfactory in the present framework which restricts movement to maximal and zero projections (cf. Chomsky (1986)). The goal of this paper will be first to propose a theory of quantified nominals along the lines of the recently developed DP-analysis, and add Q to the inventory of functional heads; and, second, to suggest that ne is a maximal projection, namely an NP in the complement of Q, selected and assigned partitive Case by it.

The paper is organized as follows: In §2. we will examine evidence that seems to indicate that ne is not a maximal category. We will show that there are not only theoretical, but also empirical reasons to exclude this analysis. In §3., we introduce the hypothesis that Q is a functional head which selects the maximal projection linked to ne. In §4., we discuss and dismiss the possibility that this projection is a PP, concluding that ne is linked to a NP. In §5., we show that this NP must be distinguished from the partitive PP that appears in some cases, which must be considered as a second argument of Q. In §6., we finally address the question as to what kind of empty category appears in the complement of a bare Q when ne is not present.

**2. The N'-analysis**

Belletti and Rizzi (1981) treat ne as an N' in a structure like (1) on the grounds that the quantifier in the Spec of NP remains in place after ne-cliticization. In (2), the quantifier tre, supposed to be in the Spec of the NP tre racconti del nonno, is stranded when ne-cliticization applies:

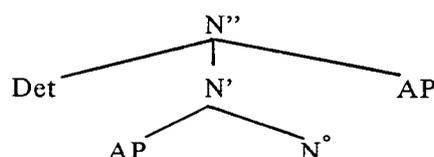


- (2)
- a. Maria conosce tre racconti del nonno  
Mary knows three stories of grandpa
  - b. Maria ne conosce tre  
Mary NE knows three

A second argument for the N'-status of ne is given by Rizzi (1979). Assuming a structure like (3), where prenominal APs are under N' and postnominal APs are under N'', he argues that prenominal adjectives cannot be stranded by ne cliticization, as shown

by the contrast in (4):

(3)



- (4)
- a. Ho letto un lunghissimo libro  
[I] read a very-long book
  - b. \*Ne ho letto un lunghissimo
  - c. Ne ho letto uno lunghissimo

According to Rizzi, the ungrammaticality of (4b) is expected if ne is an N'. In other words, ne cannot be an N', leaving a prenominal adjective under N'. The contrast between (4b) and (4c), is also expected if the adjective in (4c) is placed under N'', like the postnominal AP in (3). In fact, in (4b) the adjective must be prenominal, on a par with (4a), since in both cases the quantifier is un. In (4c), instead, the adjective must be analysed as postnominal, since the quantifier displays the full form uno, which also appears when the quantifier is bare, as in ne ho letto uno ("I read one").<sup>1</sup>

Rizzi's observation is confirmed by the behaviour of other kinds of adjectives and by the appearance of an argument of the noun in the cliticization context. While in the case of a full NP, the AP can be in either prenominal or postnominal position, when ne-cliticization applies, only postnominal adjectives can appear. This is apparent in the case of adjectives, such as mero in (5) and certo in (6). The former can only appear prenominally and is ungrammatical when ne-cliticization applies, the latter has a different interpretation according to the position it occupies and maintains only the postnominal one in the cliticization construction:

- (5)
- a. Si è fatta una mera illusione.
  - b. \*Si è fatta una illusione mera.
  - c. \*Se ne è fatta una mera.  
(she) NE had a mere illusion
- (6)
- a. Ha dato una certa notizia.  
[he] gave a certain (=given) piece of news
  - b. Ha dato una notizia certa.  
[he] gave a certain (=sure) piece of news
  - c. Ne ha data una certa.  
[he] NE gave one certain (=sure)

Furthermore, an argument of the noun can appear in situ, again apparently supporting the hypothesis that ne binds an intermediate projection of N:

- (7)
- Maria ne conosce tre del nonno  
Maria NE knows three of granpa

## 2.1. Against the N'-analysis

Despite the reasons seen above to assume that ne is an N', there are both theoretical and empirical problems with this kind of analysis (see also Cinque (1990b)).

As Chomsky (1986) suggests, movement appears to be restricted to minimal and maximal projections across languages. It would therefore be desirable to dispense with the N'-analysis.

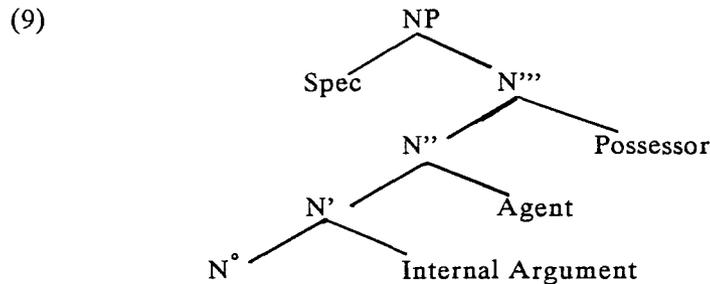
There are also two empirical problems with this kind of approach. One is noticed by Cinque (1990b) and concerns the impossibility of stranding an adjective such as

principale, which can only appear postnominally in the base:<sup>2</sup>

- (8) a. Ho un argomento principale.  
 [I] have a main argument  
 b. \*Ho un principale argomento.  
 c. \*Ne ho uno principale.  
 [I] NE have one main

The ungrammaticality of (8c) cannot be dealt with in an N'-analysis, unless we assume that principale, contrary to other postnominal adjectives, is generated under N', in a structure like (3).

In the second place, recent work by Giorgi and Longobardi (1990) argues for a more structured analysis of NPs and shows that there is a hierarchy among the arguments of a noun, as represented in a structure like (9):



The possibility of leaving any argument of the noun stranded forces one to the assumption that ne can resume any projection of N, from N° to N''':

- (10) a. Di ritratti, ne possiedo due di mio nonno.  
 b. Di ritratti, ne possiedo due di Picasso.  
 c. Di ritratti, ne possiedo due di quel collezionista  
 of pictures [I] NE own two of  
 a. [Theme]/ b. [Agent]/ c. [Poss]  
 d. Di ritratti di quel collezionista, ne possiedo due  
 of pictures of that collector, [I] NE own two

However, for a lexical item to stand for different projectional levels is theoretically undesirable. Furthermore, the fact that ne can also link an N° mars the argument built on the non- occurrence of prenominal adjectives, seen above in (4), (5) and (6). In fact, ne would stand for a lower projection than the one to which the AP is attached, predicting, contrary to fact, the grammaticality of (4b), (5c), and (6c) meaning the same as (6a).

### 3. An alternative proposal

In this section, we will first propose that ne is always linked to a maximal projection in the complement of Q, which is taken here as a functional projection (cf. §3.1). In order to analyse the (apparent) cases of N'-projections seen above, we will appeal to the "modifier hypothesis", which analyses all material left in place by ne cliticization as modifying the maximal projection linked to ne (cf. §3.2).

#### 3.1. The QP-hypothesis

The incompatibility of the N'-analysis with the restriction of movement to minimal



- (13) a. una notizia certa (cf.(6b))  
 b. Ne ho sentita una certa (cf.(6c))
- (14) a. Questa notizia è certa  
 this piece of news is certain (=sure)  
 b. Ritengo questa notizia certa  
 (I) believe this piece of news certain

We can now explain why principale, although postnominal (15a), does not enter the ne-cliticization construction (15b). Since it can only be attributive (cf. Cinque (1990, citing Bolinger (1967))), it cannot appear in configuration (12), an observation independently supported by its ungrammaticality in predicative constructions (16):

- (15) a. Ho dato un argomento principale (= (8a))  
 b. \*Ne ho dato uno principale (=8c)
- (16) a. \*Questo argomento è principale  
 b. \*Ritengo questo argomento principale

Notice now the class of nationality adjectives that can only appear postnominally (cf. \*un tedesco libro, "a German book"), and can generally be the head of a predication construction:

- (17) a. un libro tedesco  
 a book German  
 b. Ne ho letto uno tedesco  
 [I] NE read one German
- (18) a. Questo libro è tedesco  
 this book is German  
 b. Ritengo questo libro tipicamente tedesco  
 [I] believe this book typically German

Nationality adjectives can also bear the agent  $\Theta$ -role assigned by a deverbative nominal (cf. Giorgi and Longobardi (1990)). In this case, although always postnominal, they cannot be left in place by ne-cliticization nor enter the predicative constructions:

- (19) a. l'invasione tedesca della Polonia  
 the German invasion of Poland  
 b. \*Ne ho vista una tedesca (della Polonia)
- (20) a. \*L'invasione (della Polonia) fu tedesca  
 b. \*Ritengo questa invasione tedesca

The ungrammaticality of (19b)-(20) is to be reduced to the fact that the adjective tedesco, in order to be assigned a  $\Theta$ -role, must occupy the canonical subject position under N" and cannot be found in configurations such as those in (12).

### 3.2.2. Clauses

Relative clauses are generally assumed to be adjoined to NP in the same fashion as the modifier in (12a). The prediction is then that they can be stranded by ne-cliticization, as is actually the case:<sup>7</sup>

- (21) a. un argomento che ho discusso ieri  
 an argument that [I] discussed yesterday  
 b. Ne è rimasto uno che ho discusso ieri  
 NE remained one that [I] discussed yesterday

Interestingly, argument clauses, which are internal to NP, give the opposite results, as predicted again by our hypothesis:

- (22) a. C'è una possibilità che Maria venga  
there is a possibility that Mary comes  
b. \*Ce n'è una che Maria venga  
there is one that Mary comes

### 3.2.3. Nominals

The discussion up to now leads us to a reinterpretation of the sentences presented in (7) and (10). Under the interaction of the QP-hypothesis with the modifier hypothesis, the material stranded by ne-cliticization cannot be internal to NP, but must occur in the adjoined position, namely it must be reanalysed as modificational/ predicational. What we expect is that this process is restricted to some elements, and that exactly the same kind of elements can also enter a predicative construction. This prediction is borne out.

First consider internal arguments. In (23)-(26), we see the case respectively of a prepositional and nominal argument of an unergative noun, in (27)-(28) the case of the argument of an ergative noun. Both stranding in ne-cliticization and predicative constructions are ungrammatical:

- (23) a. l'appello (del presidente) a tutto il popolo  
the appeal (of the president) to all the people  
b. \*Ne hanno pubblicato uno (del presidente) a tutto il popolo  
[they] NE published one (of the president) to all the people  
(24) a. \*L'appello (del presidente) è stato a tutto il popolo  
the appeal (of the president) was to all the people  
b. \*Ritengo l'appello (del presidente) a tutto il popolo  
[I] believe the appeal (of the president) to all the people  
(25) a. la descrizione di Maria di Gianni  
the description by Mary of John  
b. \*Ne ho sentite due diverse di Gianni  
[I] NE heard two different of John  
(26) a. \*Questa descrizione è di Gianni  
this description is of John  
b. \*Ritengo questa descrizione di Gianni  
[I] believe this description of John  
(27) a. l'arrivo di Maria  
the arrival of Mary  
b. \*Ne ho visto uno di Maria  
[I] NE saw one of Maria  
(28) a. \*L'arrivo è di Maria  
the arrival is of Maria  
b. \*Ritengo l'arrivo di Maria  
[I] believe the arrival of Maria

In (29)-(30) we see the case of the subject of an intransitive noun, in (31)-(32) the case of the subject of a transitive noun. In both, the external argument cannot be left stranded by ne-cliticization nor appear in predication constructions:

- (29) a. la telefonata/camminata di Gianni  
the call/walk of John  
b. \*Ne ho sentita/vista una di Gianni  
[I] NE heard/saw one of John  
(30) a. \*Quella telefonata/camminata era di Gianni

- that call/ walk was of John
- (31) b. \*Ritengo quella telefonata/camminata di Gianni  
[I] believe that call / walk of John
- a. la rinuncia di Gianni (ad una carica importante)  
the renunciation of John to an important office
- b. \*Ne approvo una di Gianni  
[I] NE approve one of John
- (32) a. \*La rinuncia è stata solo di Gianni  
the renunciation was only of John
- b. \*Ritengo la rinuncia solo di Gianni  
[I] believe the renunciation only of John

Notice that in cases such as (7) and (10) in which an argument of the noun is left by ne-cliticization, the argument can also appear in predication constructions:

- (33) a. i racconti di Cesare Pavese  
the stories by Cesare Pavese
- b. Ne ho sentiti due di Cesare Pavese  
[I] NE heard two by Cesare Pavese
- (34) a. Il racconto è di Cesare Pavese  
the story is by Cesare Pavese
- b. Ritengo questo racconto di Cesare Pavese  
[I] believe this story by Cesare Pavese
- (35) a. il ritratto di Raffaello del Duca di Urbino  
the portrait by Raffaello of the Duke of Urbino
- b. Ne ho visto uno del Duca di Urbino nella Galleria Comunale  
[I] NE saw one of the D. of U. in the city Gallery
- (36) a. Questo ritratto è del Duca di Urbino  
this portrait is of the Duke of Urbino
- b. Ritengo questo ritratto del Duca di Urbino  
[I] believe this portrait of the Duke of U.

We propose that the NPs introduced by di in (33a)-(35a) and the like are not real arguments of the noun, but modifiers which are linked to the noun by means of an R-relation of the kind Higginbotham (1983) suggests for the prenominal possessor. The context and knowledge of the world will make it possible to interpret them, respectively, as agent and theme.

A theory of modification and R-relation is independently needed to account for the interpretation of possessors in underived nominals, such as casa and libro in (37):

- (37) a. la casa di Maria di LeCorbusier  
the house of Mary by LeCorbusier
- b. il libro di Pavese di Gianni  
the book by Pavese of John

The nominals in (33a)-(35a), therefore, have two possible interpretations: one as derived nominals with their own argument structure, the other as underived nominals, with modifiers in an R-relation with the noun (cf. Bottari (1989), Grimshaw (1990) and the references quoted there). Only the second analysis allows (33b) and (35b), as well as (34) and (36). This is indirectly supported by the fact that only in the second analysis, a derived nominal such as racconto is quasi-synonym to an underived nominal such as storia:

- (38) a. le storie di Cesare Pavese  
b. Ne ho sentite due di Cesare Pavese
- (39) a. Questa storia è di Cesare Pavese

- b. Ritengo questa storia di Cesare Pavese

We can therefore conclude that ne binds a maximal projection in the complement of Q and that all evidence to the contrary is only apparent and can be dealt with in a theory of modification and R-relation.

The problem now is to establish which kind of category this maximal projection is. So far, we have assumed for ease of exposition that it is of category NP. In what follows, we will substantiate this hypothesis.

#### 4. The categorial status of the complement of Q

In previous literature, the hypothesis that ne is a prepositional clitic has been proposed more than once (cf. Kayne (1975), Belletti (1978)). In this section, we will consider the possibility that the complement of Q' can be a PP. It will be clear that, although appealing at first sight, this analysis must be rejected. Instead, we will conclude that Q' always selects an NP, which must be distinguished from the partitive PP that appears in certain cases.

##### 4.1. The PP-analysis

The fact that in some cases, the preposition di appears in partitive contexts, as in (40), may suggest that the complement of Q is a PP:

- (40) a. Ho visto molti di quei ragazzi  
       [I] saw many of those boys  
       b. Di ragazzi inglesi, ne ho visti molti la settimana scorsa.  
       of English boys [I] NE have seen many last week  
       c. Di quei ragazzi, ne ho visti molti la settimana scorsa.  
       of those boys [I] NE have seen many last week

Although di is excluded in the basic position when the partitive is indefinite:

- (41) Ho visto molti (\*di) ragazzi.  
       I saw many (\*of) boys

it could appear nevertheless desirable to assume the same structure (42) for both (40) and (41) and ascribe the different distribution of the preposition to independent factors. A structure like this has been proposed for English by Jackendoff (1968) to unify partitive phrases such as many of the books and many books:

- (42)
- ```

      QP
     /  \
    Q    PP
         /  \
        (di) NP
  
```

This hypothesis would have the advantage of unifying all uses of ne. Partitive ne in (40) appears to be a prepositional clitic on a par with non-partitive ne in (43), which stands for PPs introduced by di or da, as the glosses in parentheses show:

- (43) a. Ne ho parlato                   (ne = del progetto)  
       [I] NE have spoken           (NE = of the project)

- b. Ne ho comprato un ritratto (ne = della regina)  
 [I] NE have bought a picture (NE = of the queen)
- c. Ne uscì un uomo (ne = dalla casa)  
 [there] NE came out a man (NE = from the house)
- d. Non riesce ad uscirne (ne = da questa situazione)  
 [he] cannot get out NE (NE = from this situation)

However, the hypothesis of the categorial uniformity of ne must be rejected on the basis of empirical evidence, since the case of a definite partitive as in (40a) and that of an indefinite partitive as in (41) display some further differences which could not be explained if they were to be analysed in terms of the same syntactic structure.

#### 4.2. Against the PP-analysis

First notice that, if a PP is always structurally present in partitive constructions, extraction of a wh-phrase and of genitive ne from inside the NP is predicted to be always ungrammatical. But, as the contrasts in (44)-(45) indicate, it is ungrammatical only in the case of a partitive phrase containing a definite NP:<sup>8</sup>

- (44) a. Di chi hai comprato [<sub>QP</sub> molti [<sub>α</sub> quadri [<sub>PP</sub> t]]]?  
 whom did you buy many pictures of?  
 b. \*Di chi hai comprato [<sub>QP</sub> molti [<sub>PP</sub> dei quadri [<sub>PP</sub> t]]]?  
 whom did you buy many of the pictures of?
- (45) a. ne ho comprato [<sub>QP</sub> molti [<sub>α</sub> quadri [<sub>PP</sub> t]]]?  
 [I] NE bought many pictures  
 b. \*ne ho comprato [<sub>QP</sub> molti [<sub>PP</sub> dei quadri [<sub>PP</sub> t]]]?  
 [I] NE bought many of the pictures

Given that it does not seem feasible to reduce the contrast in (44)-(45) to the lexical vs. non-lexical status of the preposition, the ungrammaticality of the b-sentences suggests that a PP node is not transparent for extraction and, when extraction is possible as in (44a)-(45a), it is not to be assumed. Therefore  $\alpha$  in (44a) and (45a) is not a PP, so it is NP.

Another problem with a unified analysis such as (42) is the contrast in (46). (46b) shows that a definite partitive phrase must be plural and cannot agree in number with the singular quantifier.<sup>9</sup> This is not the case in (46a), where an indefinite partitive appears:

- (46) a. una ragazza/ \*una ragazze  
 a/one girl(\*s)  
 b. una delle ragazze/ \*una della ragazza  
 one of the girl\*(s)

In (46b), a PP is present and no agreement is required (or, as a matter of fact, possible) between the quantifier and the noun phrase inside the PP. If a PP node were present also in (46a), we would expect the same pattern as in (46b) to hold. Instead, in (46a), no PP is structurally represented, and the quantifier obligatorily agrees with the (head of the) noun phrase.

As the following contrasts show, the lexical form of the quantifier is different in the case of the indefinite and the definite partitive. If a PP were always structurally present, we would expect the pattern in (47b) to hold also in (47a):<sup>10</sup>

- (47) a. un ragazzo/\*uno ragazzo  
 a boy/ one boy  
 b. uno dei ragazzi/\*un dei ragazzi  
 one of the boys

Notice, finally, that the interpretation of the clitic ne and that of the tonic pronominal form nearest to it di loro are different: The former refers to some non-specific individuals, the latter refers to a specific group:

- (48) a. Ne ho visti molti.  
           [I] NE saw many  
       b. Ho visto molti di loro.  
           [I] saw many of them

It seems undesirable to derive this semantic contrast from some intrinsic property of the clitic pronoun with respect to the tonic one. Under the hypothesis that di loro is a PP, given the fact that the tonic pronoun loro is definite, the contrast in (48) follows from the different syntactic structure in the two cases. It can thus be regarded as a further argument for the assumption of two categorially different partitive phrases in Italian.

Up to this point, we have excluded the possibility that the complement of Q° is always a PP. We have also reached the conclusion that the indefinite partitive is an NP and the definite one a PP. However, this still leaves the possibility open that both can occur in the complement of Q, and that when ne-cliticization applies, ne is ambiguous between the two.

#### 4.3. For the NP-analysis of "ne"

(49)-(53) below provide empirical evidence to exclude the selection of a PP by Q° and the PP-status of ne. In (49) we see that in a left-dislocation construction, a PP is only optionally resumed by a clitic, if this exists at all, whereas a resumptive clitic must be present when the dislocated element is an NP, (50) (cf. Cinque (1990a)). Partitive ne behaves like this latter case (51), which shows that it is unambiguously an NP:

- (49) a. A Milano, (ci) sono andata ieri  
           to Milan, there I went yesterday  
       b. Di questo libro (ne) hanno parlato molto bene  
           of this book [they] NE spoke very well  
       c. Per Mario, è andata perfino a New York.  
           for Mario [she] went even to New York  
       (50) I ragazzi, \*(li) ho visti  
           the boys [I] them saw  
       (51) a. Di ragazzi francesi, \*(ne) ho conosciuti molti  
           b. Di quei ragazzi francesi, \*(ne) ho conosciuti molti  
           of those French boys [I] NE met many

Another crucial difference between partitive ne and all other prepositional clitics, including non-partitive ne, concerns the surfacing of agreement on the past participle. Prepositional clitics do not trigger agreement on the past participle, which displays the unmarked morpheme -o, while ne in (53b) does, on a par with NP-clitics like the one in (53a):<sup>11</sup>

- (52) a. Ci ho parlato/\*a/\*i/\*e  
           [I] with him/her/them spoke  
       b. Ne ho parlato/\*a/\*i/\*e  
           [I] NE have spoken  
       (53) a. Li ho visti/\*o  
           [I] them saw  
       b. Ne ho visti/\*o molti  
           [I] NE saw many

Notice that in a more recent framework, the clitic *lo/ la*/etc. must be considered linked to a DP. The parallelisms discussed in this paragraph could suggest that the same holds for partitive *ne*. Since this assumption is not uncontroversial (cf. also the discussion in note 7), and since the conclusions we have reached so far do not hinge on either possibility, in the following we will continue to treat *ne* as a NP, for ease of exposition.

## 5. The complex structure of QP

We have just shown that partitive phrases are categorially different, depending on their definite or indefinite status. In the case of an indefinite partitive, no P is present and we are dealing with an NP; in the case of a definite partitive, we have a PP.

The position of the NP-complement, which is linked to *ne*, must be distinguished from the one occupied by the definite partitive, since they can cooccur:<sup>12</sup>

- (54) (talking of books)  
*Ne ho letti molti e [di quelli che mi hai dato tu].*  
 [I] NE have read many of those you gave me

The definite partitive phrase in (54) is crucially not right-dislocated, as there is no pause between it and the quantifier and it can be contrasted, contrary to right-dislocated elements:

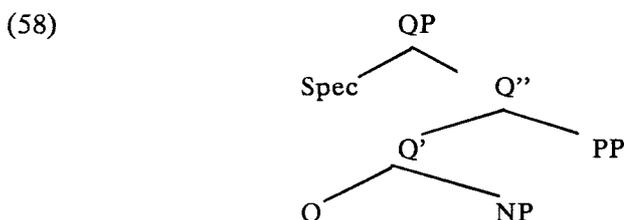
- (55) a. *Ne ho letti molti di QUESTI, non di quelli.*  
 [I] NE have read many of these, not of those  
 b. *\*Ne ho letto un libro di GIANNI, non di Maria.*  
 [I] NE have read a book of G., not of M.

Furthermore, a definite partitive can also cooccur with an overt NP complement (Giuseppe Longobardi, p.c.)<sup>13</sup>:

- (56) *Ho letto molti libri [di quelli che mi hai consigliato tu]*  
 [I] have read many books of those you recommended to me

These data clearly show that the NP and the PP have two different positions. We suggest that the NP is directly selected by Q, hence obligatory, as in (57a), and that the PP is an indirect complement of Q and appears optionally, as in (57b); the structure we propose is that in (58):<sup>14</sup>

- (57) a. *Ho letto molti \*(libri).*  
 [I] read many books  
 b. *Ho letto molti libri (di quelli che mi hai dato tu).*  
 [I] read many books (of those that you gave me)



Given some version of the Uniformity of Theta Assignment Hypothesis (UTAH) (cf. Baker (1988:46)):

- (59) Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

we suggest that the position of the PP is always the same, no matter whether the NP is realized, as in (54) and (56), or is empty, as in molti [e] di quelli, "many of those". This proposal also implies that the two partitives have different thematic relationships to the quantifier. In the same fashion as an NP is saturated by the determiner (cf. Longobardi (1990)), the NP in (58) is the predicate saturated by the quantifier. On the other hand, the PP represents the set of quantification.

Given that partitive ne has proven to be the NP complement of Q, one may wonder why it surfaces with genitive morphology. The only plausible assumption is that this Case is the realization of an abstract partitive Case assigned by Q.<sup>15</sup> This is also suggested by the fact that indefinite Qs assign a partitive interpretation to their complement.

Since partitive Case is only compatible with an indefinite NP (cf. Belletti (1988)), the complement of Q can only be indefinite. For a definite nominal to have partitive interpretation, it must be embedded under a preposition and assigned Case by it. This provides a straightforward explanation for the necessity of the preposition in (60a) and its impossibility in (60b):<sup>16</sup>

- (60) a. Ho visto molti \*(di) quei ragazzi che mi hai presentato la settimana scorsa.  
[I] saw many \*(of) those boys that you introduced me last week  
b. Ho visto molti (\*di) ragazzi.  
[I] saw many (\*of) boys

## 6. The empty category

Under the analysis proposed above, according to which an indefinite Q obligatorily selects a NP complement, a phrase such as molti dei tuoi libri must contain an empty category, as in (61):<sup>17</sup>

- (61) Ho letto [[molti [ e]] dei tuoi libri]  
[I] read many of your books

It would be theoretically plausible that molti can function as a pronominal, taking no complement at all, hence there would be no empty category involved. This possible analysis must be excluded on empirical grounds, since the bare quantifier in (62a) is unacceptable and ne is obligatory:

- (62) a. \*Ho letto molti.  
[I] read many  
b. Ne ho letti molti.  
[I] NE read many

The ungrammaticality of (62a) is to be reduced to some condition on the licensing of empty categories. Following Rizzi (1986), we assume that the licensing of an empty category consists in two requirements: formal licensing, i.e. government by a proper head, and identification, i.e. recovery of its feature content. Since (61)-(62) display the same structural configuration, we assume that formal licensing is satisfied in all the three cases: the empty category is head-governed by the quantifier.

The difference between (61) and (62b) on the one hand and (62a) on the other must then follow from the identification requirement, which appears to be met in the former but not in the latter. What seems to allow the identification of the empty category in (62b) is the presence of an antecedent, namely ne. In (61), the empty category, which can be nothing else than pro (since it is in a governed position and is not derived by move-

ment), appears to be assigned a content by the partitive PP. Given that there is obligatory feature matching between the NP complement to Q and the NP in the partitive PP (cf. note 13), we suggest that the empty category is identified by the same process. In other words, if for some reason UG requires that the two partitives must be non-distinct from each other when they are lexical, it is reasonable to suppose that they are interpreted as non-distinct when one of them is non-overt.

The identification requirement seems to be relaxed in some cases, in which ne does not appear when the quantified nominal is in object position. However, in this case, there is a restriction on the possible interpretation, which is limited to human beings:<sup>18</sup>

- (63) a. Ieri ho incontrato [molti [e]] per la strada  
yesterday [I] met many [people] on the street  
b. \*Ieri ho letto [molti [e]] in biblioteca  
yesterday [I] read many [things] in the library

This suggests that a special mechanism is at work here, namely that the pro is identified by assignment of a quasi-existential arbitrary interpretation.

Contrary to the obligatory generic time reference that is found with quasi-universal arbitrary pros, as those discussed by Rizzi (1986) and reported in (64), the quasi-existential interpretation of pro in (63) is also compatible with specific time reference, as in (65b). This is consistent with the pattern of properties attributed by Cinque (1988) to quasi-existentials:

- (64) a. La buona musica invoglia [e] a restare  
the good music induces to stay  
b. \*La buona musica ha invogliato [e] a restare  
(65) a. La buona musica invoglia [molti [e]] a restare  
b. La buona musica ha invogliato [molti [e]] a restare

The object position contrasts with the preverbal subject position, where ne is impossible and the interpretation is not restricted to human beings:

- (66) \*[molti [e]] ne hanno telefonato/abbaiato  
(67) a. [molti [e]] hanno telefonato  
many called  
b. [molti [e]] hanno abbaiato  
many barked

We agree with Belletti and Rizzi (1981) in analysing the impossibility of ne in (66) as due to ECP, namely the lack of c-command of the trace in preverbal subject position by the clitic attached to I°. However, the lack of ne in (67) does not lead to arbitrary interpretation, as in (63a). We propose that the empty category in preverbal subject position is identified by coindexation of Q with Agr. Agr provides person features to the quantifier which is equipped only with number and gender features. This allows Q to identify the empty category, making the arbitrary interpretation unnecessary.<sup>19</sup>

Since in Italian, feature sharing with Agr can only take place via spec-head agreement, the feature sharing between Q and Agr only applies to the preverbal subject. Therefore, it is expected that a bare Q in postverbal subject position behaves in a different way. In fact, the interpretation is, again, restricted to human beings:

- (68) a. Hanno telefonato [molti [e]]  
called many [people]  
b. \*Hanno abbaiato [molti [e]]  
barked many [dogs]

This interpretation is to be reduced to the same mechanism which is operative in object

position in (63a).

Notice now that the postverbal subject position patterns with the preverbal one with respect to the presence of ne. In (69) ne is excluded on a par with (66):

(69) \*Ne hanno telefonato/abbaiato molti

This parallelism should be explained in terms of ECP. The ungrammaticality of (69) seems to show that the postverbal subject position in Italian is not a L-marked position, hence a barrier for extraction. The case of a left-dislocated quantified nominal, as in (70), is very similar to that of the preverbal subject position in (67):

(70) [Molte [pro]] le ho lette.  
many [I] them read

The left-dislocated QP is coindexed with the definite clitic pronoun le, which provides the head Q with the necessary features to identify the empty category.

Finally, Belletti and Rizzi (1981) notice that in the case of the object of a preposition, ne cannot be extracted, as expected, but a bare quantifier can marginally appear:

(71) a. \*Ne ho discusso su alcuni  
b. ?Ho discusso su alcuni  
[I] discussed on some

In (71b) the interpretation of the empty category is not [+human], as in the case of bare quantifiers in object and post-verbal subject position above, but must depend on some rescue mechanism which assigns a content to *pro* by means of the information present in the discourse. The marked status of this strategy is revealed by the marginality of the construction. As expected, if the empty category embedded under Q is interpreted as [+human], the sentence in (71b) becomes completely acceptable.

## 7. Concluding Remarks

The simple hypothesis that Q is a head which selects an NP complement has proven to have a number of welcome consequences. It permits a straightforward account of the syntax of ne and, more generally, a principled analysis of quantified nominals.

Given that partitive ne behaves as a nominal (see §4.3) and therefore cannot be linked to a PP, current analyses would be forced to assume N'-movement, which is excluded both on theoretical and empirical grounds, as we have shown in §2.1. The QP-hypothesis, combined with the modifier hypothesis (see §3.2), permits us to analyse ne as linked to the NP-complement of Q.

The investigation of the syntax of ne has revealed some properties of the head Q. It selects a complement NP to which it assigns partitive Case (that surfaces in Italian in the genitive morphology of ne). It also selects a partitive PP, introduced by the preposition di and containing a definite nominal. This nominal must be non-distinct from the NP complement of Q, a property that is possibly connected with the semantics of indefinite quantifiers. This property seems to play a crucial role in the identification of the empty category when the complement NP happens to be not lexically realized.

We have also investigated some other cases in which a bare quantifier seems to be possible. In the object position we have seen that two possibilities hold: either ne must be present, or the quantified nominal has quasi-existential arbitrary interpretation. In postverbal subject position ne cannot appear and only the arbitrary interpretation is possible. In preverbal subject position, on the other hand, ne is excluded, but any interpretation is allowed.

This pattern can be explained in our framework by the simple observation that Q, being the selecting head, satisfies the government requirement in the formal licensing of

the empty NP position. With regard to the identification requirement, Q does not carry all the features necessary for a referential interpretation, displaying number and gender features and crucially lacking person features. Number and gender features are sufficient to instantiate the arbitrary interpretation. When Q receives person features through coindexation with some other element in the clause, the quantifier can fully identify the empty category in its complement. We have suggested that a process of this kind is operative when QP is in SpecAgrP and when it is coindexed with a resumptive clitic in left-dislocation constructions. Finally, whatever theory is assumed for the relation between a clitic and its base position, the clitic ne is sufficient to give a content to the empty category it is linked to.

### Footnotes

\* Previous versions of this paper have been presented at the 3rd Vienna Syntax Round Table, October 1989, at the Workshop on Comparative Syntax in Venice, June 1990, at the Séminaire Interdépartemental at the University of Geneva, June 1990, at the GISELLE Conference in Girona, July 1990. We acknowledge the audiences for constructive criticism and in particular we would like to mention Adriana Belletti, Guglielmo Cinque, Richard Kayne, Giuseppe Longobardi, Luigi Rizzi. We also thank the many scholars we had the chance to talk to about this work during the 1991 Summer School in Girona, a during our stays at the University of Geneva, MIT, UCLA. Needless to say, the responsibility it obviously only ours.

1. For a possible explanation of the complementary distribution of un/ uno in terms of phosyntactic rules, see Rizzi (1979) and Vanelli (1979).
2. Sentence (8a) is grammatical only if principale, which usually means "the most important", is reanalysed as "very important".
3. For a further discussion of this proposal and the extension of it to definite Qs such as tutti, "all", see Giusti (1991).

For the sake of exposition, we suggest in the text that Q is a functional category on a par with D. However, we must notice that the parallelism should rather be with P, in that the class of quantifiers is not as restricted as other functional classes, such as complementizers, determiners, and inflectional elements, but it is more similar to prepositions which are usually considered lexical categories although they fall into a closed class. This parallelism has already been suggested by Pesetsky (1982), who also notices that Q, as well as P, can be a Case-assigner. A way to capture these observations would be to characterize heads by means of the features [ $\pm$ lexical], [ $\pm$ functional]. V, N, A would be [+lexical, -functional], D, C, I [-lexical, +functional], P and Q [+lexical, +functional], while a [-lexical, -functional] category cannot exist for obvious reasons.

4. We are elaborating here on an idea of Cinque (1990b).
5. Interestingly, the hypothesis that it is not an N' that moves leaving modifiers or arguments in place is supported by the fact that the intonation can display a pause between the Q and what follows.
6. Some other adjectives which behave in the same way are: diversi, "different", grande, "big", numerosi, "numerous", nuovo, "new", semplice, "simple", unico, "unique", etc.
7. Relative clauses do not appear in predicative constructions, for independent reasons. The pro in the SpecCP of the relative clause (see Cinque 1990a) would not be licensed given the lack of a local identifier.

Notice that the relative clause can also be included in the NP resumed by ne, as in:

- (i) Di argomenti che ho discusso ieri, ne è rimasto uno  
of arguments that [I] discussed yesterday NE remained one

This shows that under the assumption that the relative clause is Chomsky-adjoined to

NP, ne can stand for either the internal or the external NP. Cinque (1990b), alternatively, claims that for the A-over-A principle only the higher segment of a maximal projection can be moved. A relative clause, in order to be strandable, must therefore be adjoined to a projection higher than NP, which Cinque takes to be DP. However, (i) shows that a relative clause can also be included in the constituent resumed by ne, supporting our suggestion that there are two maximal segments and that ne can resume either of them. Their status of NP or DP is not crucial for our hypothesis.

8. The English correspondents to the wh-extractions in (44) have already been noticed by Selkirk (1977).

Notice crucially that (i) is better than (44b), showing that the ungrammaticality of the latter example does not depend on the definiteness of the partitive phrase, but on the presence of a PP-barrier, as argued for in the text:

(i) Di chi hai comprato i quadri?  
of whom have [you] bought the pictures

9. This can be easily interpreted as a consequence of the inherent semantics of a partitive phrase, which requires a plural NP in order for the partitive reading to be stated.

10. Thanks to Luigi Rizzi for having pointed out to us the relevance of example (47). Rizzi (1979) noticed that the full form uno is a hint for the presence of an empty category intervening between the quantifier and the PP. We will argue for the existence of this empty category on independent grounds in section 6.

11. In northern varieties of Italian, the past participle may not agree with partitive ne, although the agreeing form is always preferred. In these varieties too, the crucial difference between NP-ne and PP-ne is found in that the latter never triggers agreement on the past participle.

12. Notice that in this case the partitive phrase can only contain a pronominal form like quelli, whereas it is ungrammatical if a full NP occurs:

(i) \*Ne<sub>i</sub> ho visti molti dei ragazzi<sub>i</sub> che mi hai presentato ieri.

The ungrammaticality of (i) can be regarded as a violation of principle C of the binding theory, since the pronominal ne binds the R-expression i ragazzi. This is not the case in (ii), since quelli is a pronoun, not an R-expression:

(ii) Ne ho visti molti di quelli

13. The head of the NP in the PP complement must be coindexed with the head of the NP complement, possibly for semantic reasons:

(i) \*Ho letto molti romanzi dei libri che mi hai consigliato  
[I] read many novels of the books that [you] to-me recommended

14. Evidence that the partitive PP introduced by di, "of", is also selected comes from the fact that this PP is only present with an indefinite Q:

(i) a. molti libri di quelli che mi hai dato tu  
many books of those you gave me  
b. \*i libri di quelli che mi hai dato tu  
the books of those you gave me

The contrast in (i) could not be explained by semantic incompatibility of a partitive phrase and a definite nominal, since a partitive phrase introduced by a different preposition, namely tra, "among", gives grammatical results:

- (ii) a. molti libri tra quelli che mi hai dato tu  
many books among those you gave me  
b. i libri di linguistica tra quelli che mi hai dato tu  
the books of linguistics among those you gave me
15. For the proposal that quantifiers can assign Case see Pesetsky (1982, ch.1), Kayne (1979, Appendix), Belletti (1988, fn. 58).
16. The preposition di functions as a Case assigner for the left-dislocated indefinite partitive in (40c) in the text above, since, for some reason, partitive Case cannot be inherited in the chain consisting of the left-dislocated element and the base position (for Case-inheritance in Left-Dislocation chains, see Cinque (1990a)).
17. In a different framework, Milner (1978) suggests that in French, un de ces livres is transformationally derived from un <livre> de ces livres. This is equivalent to our assumption of an empty category.
18. Cf. Cinque (1988, fn.36) and the references cited there.
19. Notice that this mechanism is very similar to, but not exactly the same as in the licensing of null subjects. It is in fact not restricted to null-subject languages such as Italian. In French, a non null-subject language as (i) shows, en is required when Q is in object position, and is impossible when Q occupies the subject position, (ii):
- (i) \*pro ont téléphoné.  
called
- (ii) a. J\*(en) ai vu [trois [e]].  
I EN saw three  
b. [Trois [pro]] (\*en) ont téléphoné.  
three EN called

Both examples in (ii) can be explained in the same terms as their Italian correspondents. The contrast between (i) and (iib) is due to the fact that in French, Agr is not able to license an empty pronominal in (i), whereas Q governs pro in (iib). Coindexing of Agr and Q via spec-head agreement enables Q to also identify pro, hence the grammaticality of (iib).

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## THE ITALIAN CHILD'S C-SYSTEM

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### 1. Introduction

Young Italian children allow the subject to intervene between a WH-element and the inflected verb in main WH-clauses. This is shown by an experiment executed in February 1991 with 22 Italian children (age 2;9 - 5;11) which involved WH-questions as in (1)<sup>1</sup>:

- (1) Che bambini stanno suonando?<sup>2</sup>  
what children are playing

Until the age of 3;9 the children were able to interpret the WH-element che as the object and bambini as the subject. That is, they sometimes gave the response "il pianoforte" (the piano). Furthermore, they allowed subject interpretation of the WH-phrase "che bambini" by indicating the group of children that are playing in the picture. After this age (3;9) no more object interpretations were given.

Italian adults never allow object interpretation in sentences like (1) because the sequence: WH-element-subject-inflected verb is prohibited. This is due to a special instance of V2 in Italian: V moves to C in main WH-clauses (Schaeffer (1990); Rizzi (1991))<sup>3</sup>. Assuming the WH-element to be in spec C, the subject cannot intervene between the WH-element and the inflected verb, simply because there is no position:

- (2) a. [<sub>spec C</sub> Che cosa] [<sub>C</sub> ha] mangiato Gianni?<sup>4</sup>  
          what       has       eaten     Gianni
- b. \*[<sub>spec C</sub> Che cosa] Gianni [<sub>C</sub> ha] mangiato?  
          what       Gianni     has     eaten

What is the system that accounts for the object- and subject-interpretations in Italian child language and how does this system develop into the adult's system, in which object-interpretations are impossible?

In this paper I will argue that the development of the Italian child's C-system provides an adequate explanation of this problem. This explanation favours the assumption that the maximal projection of C is present from the very early beginning (cf. Hyams (1991)).

In section 2 I will describe the experiment and its results.

Section 3 consists of five subsections:

First I will briefly dwell on three current assumptions concerning the child's C-system. Secondly I will introduce Rizzi's (1991) WH-Criterion which accounts for WH-clauses in adult language. How this Criterion can be related to the WH-phenomena in Italian child language will be shown in section 3.3. Section 3.4 outlines some supporting evidence for the assumptions made in 3.3, on the basis of Weerman's (1989) ideas with respect to modality and the role of COMP, and in 3.5 we will see how this leads to the transition into the adult grammar. Section 4 contains a brief summary, conclusions and suggestions for further research, and last but not least in the appendix I will discuss some seeming counter-evidence and the attempt to escape from ungrammaticality by some children.

## 2. Experiment and data

### 2.1 Experiment

In February 1991 I presented 22 Italian children (age 2;9 - 5;11) with six pictures. Each picture was accompanied by two informative sentences and a question of type (1), here repeated as (3)<sup>5</sup>:

(3) Che bambini stanno suonando?  
what children are playing

(4) through (10) will give you the stories and the questions asked. For the pictures I refer to the appendix.

(4) Ci sono cinque bambini. Tre bambini stanno suonando il pianoforte. Mostrami:  
"There are five children. Three children are playing the piano. Show me:"

Che bambini stanno suonando?  
"What children are playing?"

(5) Ci sono quattro ragazze. Due ragazze stanno dipingendo un quadro. Mostrami:  
"There are four girls. Two girls are painting a picture. Show me:"

Che ragazze stanno dipingendo?  
"What girls are painting?"

- (6) Ci sono quattro elefanti. Due elefanti stanno schizzando una palla con acqua. Mostrami:  
 "There are four elephants. Two elephants are squirting a ball with water. Show me:"
- Che elefanti stanno schizzando?  
 "What elephants are squirting?"
- (7) Ci sono quattro scimmie. Due scimmie stanno scalando una roccia. Mostrami:  
 "There are four monkeys. Two monkeys are climbing a rock. Show me:"
- Che scimmie stanno scalando?  
 "What monkeys are climbing?"
- (8) Ci sono quattro cavalli. Due cavalli stanno saltando un cancello. Mostrami:  
 "There are four horses. Two horses are jumping over a fence. Show me:"
- Che cavalli stanno saltando?  
 "What horses are jumping?"
- (9) Ci sono quattro gatti. Due gatti stanno graffiando una poltrona. Mostrami:  
 "There are four cats. Two cats are scratching an armchair. Show me:"
- Che gatti stanno graffiando?  
 "What cats are scratching?"

When the children gave responses like "the piano" (4), "the picture" (5), "the ball" (6), "the rock" (7), "the fence" (8) or "the armchair" (9), either by indicating with their finger or by pronouncing the actual words, the WH-element was considered to be given object-interpretation. If, however, they pointed to the playing children, the painting girls etc., the responses were judged to be (adult-like) subject-interpretations of the WH-phrases [<sub>NP</sub> [<sub>spec</sub> N' che] [<sub>N</sub> X]].

One might wonder if the WH-elements in questions such as in (4) - (10) would not be interpretable as objects for adults, too. The fact that adults do not utter WH-clauses in which the subject intervenes between the WH-element and the inflected verb and even judge them to be ungrammatical, does not necessarily imply that they are not able to interpret them either. This could be similar for the child: it is able to interpret WH-clauses with the sequence WH-subject-V<sub>fin</sub>, but it does not produce them. In fact, I have hardly found such WH-clauses in spontaneous speech so far. If this were true, there would be no difference between the child's and the adult's grammar and the phenomenon as described in (1) would not need a syntactic account.

However, the execution of the experiment with some Italian adults pointed out that a sentence like (1) is impossible to be interpreted as WH-movement of the object because the subject (bambini) is not preceded by an article, which is prohibited in Italian. It would go beyond the scope of this paper to explain the behaviour of the article in Italian, but it is necessary to say here that in adult Italian bare NPs are not allowed, not even in a generic sense (as it is possible in certain Germanic languages: Longobardi (1991); Brugger (p.c.)). Therefore, che bambini is immediately interpreted as a unity, questioning the subject. To make sure that this property of adult Italian was taken into account, I not only presented the children with the questions given in (4) - (9), but also with their "article-added" counterparts:

- (10) Che i bambini stanno suonando?  
"What the children are playing?"
- (11) Che le ragazze stanno dipingendo?  
"What the girls are painting?"
- (12) Che gli elefanti stanno schizzando?  
"What the elephants are squirting?"
- (13) Che le scimmie stanno scalando?  
"What the monkeys are climbing?"
- (14) Che i cavalli stanno saltando?  
"What the horses are jumping?"
- (15) Che i gatti stanno graffiando?  
"What the cats are scratching?"

## 2.2 Hypothesis

If the children gave object-interpretations in the questions given in (4) - (9), this would be a strong indication that they allow the subject to intervene between the WH-element and the inflected verb. Object interpretations of the questions given in (10) - (15) would confirm this hypothesis.

However, note that the WH-elements in (10) - (15) are "easier" to be interpreted as objects for adults, since the concerning NP's fulfil the requirement of not being a bare noun, although the questions would still be ungrammatical. Therefore, older children, who are aware of this requirement, could possibly give object interpretations in an adult fashion, that is: they give object interpretation, not because their syntactic structure allows them to, but because they understand what is meant to ask and can interpret the questions that way.

The next subsection will outline how the answers were patterned across interpretations and children.

### 2.3 Results

Table I shows the answers given to questions of the type in (4) - (9), e.g. "Che bambini stanno suonando?"

Table I

| AGE   | SUBJECT | OBJECT | PERCHE' | OTHER |
|-------|---------|--------|---------|-------|
| 2;9   | 2x      | 2x     | -       | 2x    |
| 2;10  | 3x      | 3x     | -       | -     |
| 2;11  | 1x      | 5x     | -       | -     |
| 3;0   | 4x      | 2x     | -       | -     |
| 3;1   | 4x      | 2x     | -       | -     |
| 3;1   | 5x      | 1x     | -       | -     |
| 3;1   | 6x      | -      | -       | -     |
| 3;5   | -       | 2x     | 3x      | 1x    |
| 3;6   | 3x      | 3x     | -       | -     |
| 3;9   | -       | 6x     | -       | -     |
| ----- |         |        |         |       |
| 4;3   | 6x      | -      | -       | -     |
| 4;4   | 6x      | -      | -       | -     |
| 4;8   | 2x      | -      | 4x      | -     |
| 4;10  | 6x      | -      | -       | -     |
| 4;11  | -       | -      | 6x      | -     |
| 5;1   | 6x      | -      | -       | -     |
| 5;3   | 6x      | -      | -       | -     |
| 5;9   | 6x      | -      | -       | -     |
| 5;10  | 6x      | -      | -       | -     |
| 5;10  | 4x      | -      | 2x      | -     |
| 5;11  | 6x      | -      | -       | -     |
| 5;11  | 6x      | -      | -       | -     |

Table II shows the answers given to the questions of the type in (10) - (15) e.g., "Che i bambini stanno suonando?".

Table II

| AGE  | SUBJECT | OBJECT | PERCHE' | OTHER |
|------|---------|--------|---------|-------|
| 2;9  | 1x      | 3x     | -       | 2x    |
| 2;10 | -       | 5x     | -       | 1x    |
| 2;11 | 2x      | 2x     | 2x      | -     |
| 3;0  | -       | -      | 6x      | -     |
| 3;1  | 5x      | 1x     | -       | -     |
| 3;1  | 3x      | 3x     | -       | -     |
| 3;1  | 1x      | 5x     | -       | -     |
| 3;5  | -       | -      | 5x      | 1x    |
| 3;6  | 1x      | 4x     | 1x      | -     |
| 3;9  | -       | 6x     | -       | -     |
| 4;3  | 6x      | -      | -       | -     |
| 4;4  | 6x      | -      | -       | -     |
| 4;8  | -       | -      | 6x      | -     |
| 4;10 | 1x      | -      | 5x      | -     |
| 4;11 | -       | -      | 6x      | -     |
| 5;1  | 6x      | -      | -       | -     |
| 5;3  | -       | -      | 6x      | -     |
| 5;9  | 1x      | 5x     | -       | -     |
| 5;10 | 1x      | 4x     | 1x      | -     |
| 5;10 | 2x      | 1x     | 3x      | -     |
| 5;11 | 6x      | -      | -       | -     |
| 5;11 | 6x      | -      | -       | -     |

N.B.: SUBJECT = subject interpretation of WH-phrase  
che + NP  
 OBJECT = object interpretation of WH-element che  
 PERCHE' = perché (= "why") interpretation of question  
 OTHER = irrelevant answer / no answer

So for example, the first line in Table I indicates that a child of 2;9 years gave subject interpretation twice, object interpretation twice and an irrelevant answer twice.

Notice the significant difference between the age period before and after 3;9 in the experiment with the sentences without articles (Table I): before 3;9 each child (except for the one of 3;5 years old) gave one or more object interpretations, whereas after 3;9 no more object interpretations were given by any children. In the experiment with the sentences with an article we can see that object interpretations also become impossible for a while after age 3;9, but that they re-appear at age 5;9. I will return to this in the appendix as I will to the "perché" interpretations.

### 3. Explanation - Development of the C-system

#### 3.1 Three ideas concerning C

As I already mentioned in the Introduction, I assume the development of the child's C-system to be responsible for the data presented. Before going on with this data, I will first dwell briefly on three current assumptions concerning the functional category C in child language in general.

First, there is the idea of not having a C-projection at all in early child language. This idea is defended by Radford (1990) who claims that early grammar is characterized by the absence of non-lexical (=functional) categories and their projections. He argues that children start out producing small clauses, based on purely lexical categories.

Secondly, there are several (different) theories that assume the C-projection to exist only to a certain extent in the initial grammar. This can be a "re-labelling" theory (e.g. Clahsen (1989)) or a "re-categorizing" theory (e.g. Meisel & Müller (1990)), in which a certain functional category/projection is supposed to be present from the beginning, without being labelled CP yet. According to Clahsen (1989) the former IP is replaced by CP at a certain point in development. Meisel and Müller claim the maximal projection TP (Tense Phrase) to be recategorized as CP. The characteristic property of relabelling/recategorizing is that a syntactic phrase is categorically reinterpreted, the position of the phrase in the whole tree, however, remains the same.

Penner (1990) considers the nature of CP from another point of view. According to him the child starts out with an AGR2-phrase, then it expands the syntactic tree with an AGR1 and finally the full C-projection is added. In this case we could say that (part of) the complement of the CP is present from the early beginning, but the full projection including the head and the specifier is acquired at a later stage.

The third idea is maintained by Hyams (1991), who assumes that the maximal projection of C is present from the very early beginning. According to Hyams there is a broad range of empirical data from languages other than English which cannot be accounted for under the assumption that early grammars lack a functional projection C. Furthermore, she points out a developmental problem of a "non(-complete) C" theory: What are the learning and/or maturational mechanisms responsible for the emergence of a category like C?

Next I will propose an idea that can account for the possibility of having a WH-subject-Vfin sequence in Italian child language. This idea appears to support the third assumption concerning C in child language, and in a certain

sense the second one as well.

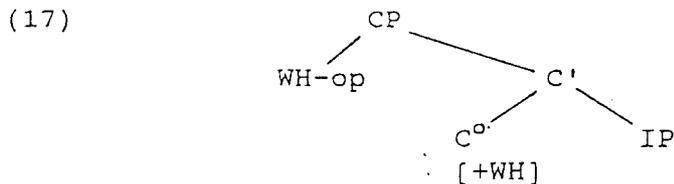
### 3.2 The WH-Criterion

As I said in the Introduction, Italian adults do not allow the subject to intervene between the WH-element and the inflected verb in main questions (compare (2a) and (2b)). It seems that V moves to C in these cases (as in English), although Italian is a non-V2 language. Rizzi (1991) accounts for this particular instance of V-movement, or "Residual V2", in the following way. The movement of the inflected verb is enforced in order to satisfy the WH-Criterion, a general well-formedness condition on WH-structures. This principle is formulated in (16):

#### (16) The WH-Criterion

- A. A WH-operator must be in a spec-head configuration with  $X^0[+WH]$
- B. An  $X^0[+WH]$  must be in a spec-head configuration with a WH-operator

The feature [+WH] on a clausal head (most typically a  $C^0$ ) indicates that the projection of that head is a question. Thus, the WH-Criterion simply expresses the fact that at the appropriate level of representation interrogative operators must be in the spec of CPs which are interpreted as questions and, reciprocally, CPs interpreted as questions must have interrogative operators as specifiers. This is exemplified by the configuration in (17):



The assumption that the feature [+WH] is borne by C itself in embedded interrogative clauses is quite plausible; it is determined by a standard licensing device, namely lexical selection. The matrix verb selects an indirect question, hence an embedded C marked [+WH]. But what about main questions?

Rizzi argues that there must be at least an independent point in a structure to which the chain of licensings can be anchored, and from which it starts. The main inflection of a sentence would be a natural candidate. Assuming I to be the carrier of [+WH] in main questions, "Residual V2" in sentences like (2a) can be accounted for by the WH-Criterion: the inflected verb, bearing the WH-feature, has to move to C, not to violate clause B of the WH-criterion (assuming the WH-operator to be in spec C). Thus, [+WH] is borne by I in main WH-clauses, whereas C is the [+WH] carrier in subordinate WH-clauses<sup>6</sup>.

### 3.3 Back to child language

How do these ideas relate to the central issue of this paper, that is, the possible sequence WH-subject-inflected verb in Italian child language?

Apparently, according to the grammar of children younger than 3;9 the inflected verb is not obligated to move to C. This could be due to several factors.

One could follow Radford and claim that C, a functional category, does not exist in early child grammar. It then logically follows that V does not move to C, simply because there is no C. However, this idea is not very plausible, either from an empirical, or from a developmental point of view.

Empirically, there is lots of evidence from Germanic languages for a C-position in child language. Dutch and German children, for example, produce Vf2-constructions at a very early age (De Haan (1986); Weverink (1989); Clahsen (1989); Meisel & Müller (1990)):

(18) dah weet ik niet                    (Weverink (1989))  
      that know I not

(19) da fährt die Caroline        (Meisel & Müller (1990))  
      there goes [the] Caroline

Furthermore, as Hyams (1991) points out, early English systematically shows "Subject-Aux-inversion" in yes/no questions:

(20) Does the kitty stand up?

(21) Can I have a piece of paper?  
                                          (Klima & Bellugi (1966))

Both phenomena (Dutch/German and English) speak strongly in favour of a second, alternative position for the inflected verb, namely C. Another argument for a C-projection in early child language, propounded by Hyams (1991) is formed by WH-questions. Radford (1990) claims that early WH-questions are generated by means of adjunction to VP or IP and not by substitution into spec CP. However, since adjunction is iterative, this raises the question why children never produce questions with multiple fronted WH-phrases such as (22) and (23):

(22) Who what saw?                    (Hyams (1991))

(23) Cosa chi ha visto?  
      what who has seen

A theory which assumes a C-projection from the beginning, does not yield this problem: the WH-element is in spec CP, as it is in adult grammar. This brings us to the developmental problem of a small

clause theory for child language as proposed by Radford: How is the emergence of the functional category C accounted for? What is the trigger?

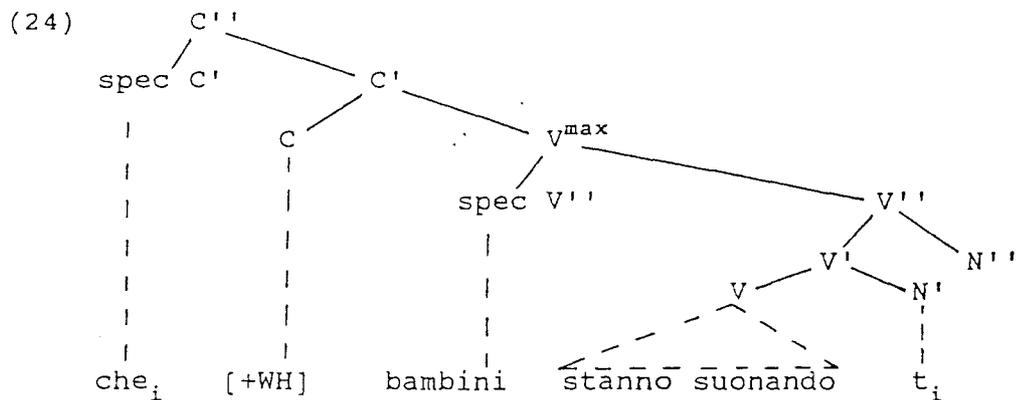
Another possibility to explain the WH-phenomena in Italian child language would be to assume V-to-C movement to be optional in Italian child language: if V moves to C, the children give subject interpretations to questions as in (1), if V does not move to C, they give object interpretation. In what follows I will demonstrate why this is not a plausible solution either.

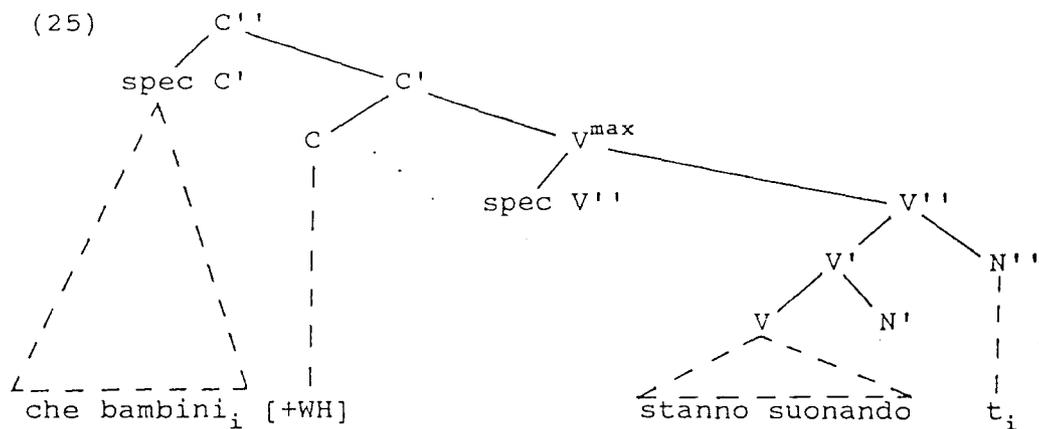
I would like to propose that there is no movement of the verb at all in early Italian child language. Since V-to-C is an exceptional case in Italian, a language specific phenomenon (Schaeffer (1990); Rizzi (1991) among others), it is tempting to assume that the Italian child starts out with a grammar without a V-to-C movement rule. In principle there is one V-position in Italian, namely  $V^0$ , and only under special conditions V moves to C.

If the WH-Criterion is a Universal Principle, this implies that it should apply to child language, too, at least, under the assumption of the Continuity Hypothesis (Pinker (1984); Clahsen (1987)). Let us say it is part of UG. Then how can the Italian child fulfil its requirements if it does not move V to C in main WH-questions?

My claim is that the child does not need to move V to C because it assumes C to bear the feature [+WH] in any WH-clause. Thus, C is filled by [+WH] and the proper spec-head configuration is met.

Sentences as in (1) would then correspond to the following tree structures in child language<sup>7</sup>:





The structure in (24) represents the object interpretation of questions as in (1), whereas (25) represents the subject interpretation.

Recall that in adult language [+WH] is borne by C only in embedded WH-clauses. So it seems that children see every clause as an embedded/subordinate clause. Intuitively, this does not seem a crazy idea. It is the subordinate clause that represents the D-structure of a sentence, so we could regard subordinate structures as being the unmarked ones<sup>8</sup>. Using the subordinate construction as a basis, root/main clauses can be generated by certain movements (e.g. V-to-C and XP-to-spec C in several Germanic languages (Weerman (1989))). In other words, main clauses are derived from subordinate structures and some extra mechanisms (like "move alpha") are needed to generate them.

Another way to look at it is to regard subordinate clauses as being anaphoric in some sense, as Nina Hyams suggested to me. Anaphors need to be bound in their governing category, in other words, they depend upon another element in their governing category. A parallel reasoning can be made with respect to subordinate clauses: subordinates need to be selected by a matrix-verb within their "governing category", that is, the highest C-projection. Thus, they depend upon another element in their governing category. Concluding, we could say that subordinate clauses are characterized by several formal properties, such as the lack of certain movements and being anaphoric.

If this is true, and if the statement that young children only know subordinate clauses, is correct, it is predicted that young children can fail to yield "main" clauses (from the adult point of view) with a correct wordorder, because of the lack of V-movement. This is found in early German as well: German children sometimes use verb final patterns in main clauses (German is an SOV/V2 language) (Clahsen (1989); Meisel & Müller (1990) among others).

Another prediction, related to the property of being anaphoric, is that children do not produce adult-like main clauses until they use anaphors properly. As far as I know, this phenomenon has not been investigated yet. It would be very interesting to study in depth the idea of "anaphoric-

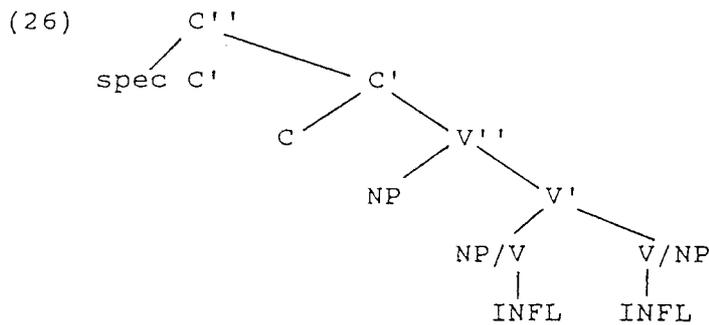
ness" of subordinate clauses, from both an empirical and a theoretical point of view.

In the following sections we will see that (Italian) children regard subordinate clauses as the analytic domain with respect to other phenomena as well. It will appear that the "lack of knowledge about main clauses" is due to the underspecification of the functional category C.

### 3.4 Supporting evidence: modality and the role of COMP

Before going on to speculate about possible features on C in child language we first need to have an idea of what C looks like in adult language. In order to discuss this, I will outline a part of Weerman's (1989) view on CP structure, and how syntactic structure can have important implications on possible or inevitable illocutionary force. I will then relate this to the relevant child language phenomena.

Weerman (1989) proposes a theory in which a sentence is a projection of C<sup>9</sup>:



In the same way as V assigns a theta-role to its arguments at DS, C assigns a modal role to its VP at DS. This is what Weerman calls "D-Identification":

- (27) D-Identification  
 $Y^{\circ}$  D-Identifies  $X^{\max}$  at D-Structure via its projection

D-Identification has a nominal and a verbal specification. In the nominal specification D-Identification is realized by theta-role assignment by V, whereas in the verbal specification C D-identifies V by assigning a modal role to V. This is how VPs and NPs are licensed at DS. Another abstract function of C is the assignment of finiteness and tense to the VP. These finiteness and tense features in C are morphologically reflected by the INFL-node under  $V^{\circ}$  <sup>10</sup>.

With respect to the licensing of the structure at S-structure, there are different options: V2 languages

require COMP to be lexical in order to assign finiteness, tense and a modal role to the VP; in non-V2 languages structures can be S-identified inherently. This "inherent S-identification" is parallel to, for example, "inherent case assignment". Thus, in a language like Italian, COMP can assign finiteness, tense and a modal role without being lexical.

According to Weerman the illocutionary force of a sentence is determined by structural considerations. It is largely derived from the fact that COMP provides mood, which can yield sentences with for example declarative, interrogative or exclamative reading. Some readings are restricted to certain syntactic structures, e.g. an infinitive construction can only occur declaratively in an embedded structure:

- (28) [Intendo [mangiare lasagne stasera]]  
intend-1st p.sg.eat-INF lasagne tonight
- (29) \*[Mangiare lasagne stasera]  
eat-INF lasagne tonight

And vice versa, some constructions allow just one particular reading; for example, infinitive constructions can occur independently only if they are given exclamative reading:

- (30) Pino mangiare verdure? Macchè!  
"Pino eat-INF vegetables? By no means!"

Italian children seem to have problems with this "modal role feature" on C. They mismatch syntactic structures and illocutionary forces. For example, (until the age of 3;3) they produce independent infinitive constructions in declarative or interrogative reading<sup>11</sup>:

- (31) a. sportello aprire (F 2;3)  
window open-INF
- b. Gabriele mangia (D 2;2)  
Gabriele eat-INF
- c. compae batte (M 1;9)  
buy-INF slippers
- d. papa lavoare (M 2;6)  
daddy work-INF
- e. fae a Mema (G 1;9)  
do-INF Mema
- f. fae io (O 2;1)  
do-INF I
- g. figue vedee (E 1;6)  
figures see-INF
- h. no lavoae mamma tati? (E 2;0)  
not work-INF mummy children
- i. anche io giocare? (P 2;5)  
also I play-INF
- j. tanta acqua bere (F 2;0)  
much water drink-INF

- k. pendee appello io (F 2;2)  
 take-INF hat I
- l. eare apano (F 2;3)  
 fly-INF aeroplane
- m. appello io pendee (F 2;3)  
 hat .I take-INF
- o. metee a posto quelli giochi (F 3;3)  
 put-INF in order those games
- p. se andiamo qua fae un giretto (F 3;0)  
 if go-1st p.pl. here  
 make-INF a walk-DIM
- q. fare la casetta (F 2;9)  
 make-INF the house-DIM

In the cases above, Italian children seem not to be aware of the fact that declarative infinitive constructions can only occur dependently in adult language. So here we see another instance of using the subordinate clause as the analytic domain: COMP assigns a declarative role to an independent (main-) infinitive construction, whereas in adult language this is only possible if the infinitive construction is dependent (embedded). In other words, Italian children seem to regard sentences as in (29) as embedded clauses from the adult's point of view. Exactly the same phenomenon is reported with respect to Dutch child language (Weverink (1989)).

To summarize, (Italian) children seem to be "confused" about the modal role feature on C, as they are "confused" about the WH-feature on C. In both cases they treat any utterance as a subordinate clause, that is, they assume C to be [+WH] and they can assign a declarative modal role to any infinitive construction, whereas these C-features are typical for subordinate, but not for main clauses in adult language.

In the following I will suggest that both phenomena are related to the fact that the child has not yet fully acquired the morphological verb inflection system (Weverink (1989), Schaeffer (1990)), as well as to each other.

### 3.5 Transition: C-features and the I-affix

As I outlined in subsection 3.4, Weerman (1989) assumes COMP to assign finiteness, tense and a modal role to its VP. Furthermore, he claims the I-affix to be the reflex of those features on C.

Extrapolating from this idea, it is plausible to assume that C cannot assign the proper modal role to VP until the I-affix has been fully acquired (cf. Weverink (1989)). Although children seem to have some notion of subject-verb agreement from the very early beginning, in the initial stage they are not able yet to compute morpheme boundaries (Pinker (1984); Clahsen (1987)). With respect to verbs this implies that young children would not have any idea of the segmentation into a stem and an affix. I will argue that this general idea holds for Italian child language as well.

From the moment Italian children start producing two-word utterances, they make very few "mistakes" in combining the right subject with a certain verb form. In the corpora of spontaneous speech I investigated, about 4% of all utterances containing a verb could be considered as agreement errors<sup>11</sup>. A large part of these errors can be blamed on the well known phenomenon of using the proper name combined with a verb in first person singular or the combination of io (I) with a verb in third person singular, as is exemplified in (32) and (33):

(32) e apo Checco (F 1;10)  
and open-1st p.sg. Francesco

(33) io o mettedo dento etto? (F 1;11)  
I it put-3rd p.sg. inside this

This is not very surprising, since, as also Pizzuto and Caselli (forthcoming) point out, third person singular can be considered the most neutral or unmarked form for person reference. Besides, the phenomenon of using proper names to refer to first person singular is often used in the input language as well:

(34) VIR: Chi è che scappa via?  
(Who is that goes away?)  
FRA: Inni.  
(=Virginia)  
VIR: No, Inni non scappa via. (fra24.cha 44%)  
(No, Inni (=Virginia) not goes away)

Therefore, it can be concluded that Italian children do have a notion of subject-verb agreement. I will call this "abstract agreement" (cf. Weverink (1989); Schaeffer (1990)). This knowledge of abstract agreement on the verb is explained by Pinker (1984) who claims that children place inflected verbal forms into a word-specific agreement paradigm. Such a word-specific paradigm expresses two things:

- (i) Each finite verb has a specific person/number reference, i.e. the child knows that a form like porta ("brings") is semantically connected with third person singular.
- (ii) There is a relation between the finite forms of one verb.

An example of an Italian word-specific paradigm is given in (35):

(35)

| NUMBER   |       |       |          |         |         |
|----------|-------|-------|----------|---------|---------|
| SINGULAR |       |       | PLURAL   |         |         |
| 1        | 2     | 3     | 1        | 2       | 3       |
| porto    | porti | porta | portiamo | portate | portano |
| metto    | metti | mette | mettiamo | mettete | mettono |
| parto    | parti | parte | partiamo | partite | partono |

The idea that children are aware of (abstract) verbal agreement, but not of morphological segmentation within the verb yet, is supported by what Pizzuto & Caselli (forthcoming) found out for the corpora they investigated:

"Several inflections (and major inflectional paradigms) are present from the earliest ages, but only a few of these achieve productive, adult-like use."

The knowledge of morphological segmentation within the verb, or, in other words, the acquisition of the I-affix, is reached at a later stage. This is shown by several empirical facts, such as the frequent use of the regular "imperfetto" (past tense), overgeneralization, or the use of the "futuro" (future tense):

- (36) io sono andato su a neve e sciavo (F 3;0)  
I went on the snow and skied
- (37) forse pioverà (F 3;0)  
maybe will-3rd p.sg. rain
- (38) e io rimango io sto con Paola (F 3;0)  
(=e io rimango io sto con Paola)  
and I stay I am with Paola
- (39) adesso si togliono così (F 3;7)  
(=adesso si tolgono così)  
now CLIT-lift up-3rd p.pl. this way

This indicates that only at the age of about 3;0 can we suppose the morphological I-affix to be fully mastered by the Italian language learner.

Recall that I assumed C not to be able to assign the proper modal role to VP until the I-affix has been completely acquired. So, after this point in development, we expect a decline of "modal role errors". This is exactly what I found in the data I investigated, at least with respect to the error of assigning a declarative modal role to an independent infinitive construction. In other words, after the acquisition of the inflectional paradigm (=

morphological I-affix) the child becomes more aware of the relation between syntactic structures and illocutionary forces with the consequence that the amount of independent infinitive constructions considerably diminishes. As a reflex of the modal role-feature on C, the I-affix triggers correct assignment of modal roles to VP. For example, the child discovers that an infinitive construction can be assigned a declarative modal role, only if it occurs dependently. This detection makes the child realize that there is a syntactic difference between main and embedded clauses, corresponding with certain restrictions concerning modal role assignment.

Let us look now at the WH-feature on C in child language and see how its development can be related to the outline above.

As I said in subsection 3.3 [+WH] is always borne by C in Italian child language. From an adult point of view the child treats every clause as a subordinate one. That this idea is plausible was shown in section 3.4.

If we assume that UG determines [+WH] to be borne by a functional head, it is not surprising that the child assumes the feature [+WH] to be on C, since its grammar does not contain another functional head (yet). As we have seen in the preceding paragraph, at the age of about 3;0 another functional head becomes available: the child acquires the morphological I-affix. So, from this point there is another candidate to bear the [+WH] feature. However, there is no reason yet why the child should change its grammar as regards this feature.

Recall that [+WH] is on C in embedded, but on I in main clauses in adult Italian. So, the availability of the I-affix by itself is not sufficient to trigger transition to the target grammar. The child needs to have knowledge of the difference between main and embedded clauses as well. As we previously noted, this was triggered by the acquisition of proper modal role assignment, which in turn was caused by the acquisition of the complete inflectional paradigm. Thus, the ability to distinguish main from embedded clauses plus the availability of another functional head, namely I, triggers a transition with respect to the feature [+WH]. The child decides that in embedded clauses [+WH] is still on C, because the matrix verb selects an indirect question, hence an embedded C marked [+WH]. As for main clauses it finds that the main inflection of the sentence is the "anchor point", and therefore the carrier of [+WH].

This implies that object interpretations of questions as in (1) are no longer possible. From this point object-interpretable main WH-clauses must have the following structure (I follow Weerman (1989) in not assuming an I-projection)<sup>12</sup>:



structure as the analytic domain. Independent evidence for the fact that children use the subordinate clause as a basis came from the children's behaviour with respect to modality, another feature on C. However, this was not the only merit of the analysis of the acquisition of modal roles. It also provided one of the necessary triggers for the transition into the target grammar as regards the [+WH] feature: the distinction between main- and embedded clauses. This "discovery" was shown to be related to the acquisition of the morphological I-affix.

Finally, it was argued that as a result of these two points in development the child decided that [+WH] had to be on I in main WH-clauses.

Thus, the child's immature knowledge of the abstract features on C (modality, [+/- WH]) combined with Rizzi's (1991) WH-Criterion account for phenomena as in (1). The above analysis supports the idea that the maximal projection of C exists from the early beginning (Hyams (1991)). However, the full and correct range of abstract features on C has not been acquired yet (cf. Penner (1990)).

A lot of problems remain open for further research, for example:

- (i) How exactly does the child discover that at a certain point [+WH] must be on I in main WH-clauses and cannot be on C anymore? Are the acquisition of the I-affix and proper assignment of modal roles sufficient to trigger this transition?
- (ii) Why does it take so long until the Italian child no longer gives any object-interpretations of questions as in (1) (age 3;9)? The I-affix and proper modal role assignment are acquired respectively by the age of about 3;0/3;3.
- (iii) Why exactly do children use the subordinate clause as a basis, as the analytic domain? What are the formal properties of subordinate clauses?
- (iv) Which role does (the development of) the article play in the theory presented? Do the language specific properties of the Italian article influence the (moment of) transition into adult grammar?

In addition, it would be very interesting to see how the presented theory applies to other (child-) languages. In order to have any explanatory and universal value, the proposed analysis should be supported by cross-linguistic evidence.

## Appendix

### Apparent counterevidence and escape from ungrammaticality

Considering the results of the experiment in Table I and II we can notice some interpretations that have not been accounted for yet, such as the object interpretations of the questions (10) - (15) given by some older children (Table II) and the "perché" interpretations (Table I and II).

Prima facie object interpretations at an age, later than 3;9, seem to form counterevidence against the theory presented above. Children of this age (5;9 - 5;11) are supposed to know that [+WH] is carried by I in main WH-clauses. They should not allow subjects to intervene between the WH-element and the inflected verb, since the inflected verb needs to move to C in order to satisfy the requirements of the WH-Criterion, which implies that there is no position left for the subject between the WH-element (in spec C') and the inflected verb (in C). Yet, if we take into account the adult's behaviour, it will appear that these kinds of object interpretations are not necessarily counter-examples against the proposed ideas. Recall that the WH-elements in (10) - (15) can be possibly given object-interpretation by adults, not because they judge them to be grammatical, but because they understand what is meant to ask. In other words, they see that e.g. che i bambini (= what the children) cannot be considered as a unity, because of the intervening article (recall the prohibition of having a bare NP in Italian); therefore, a subject interpretation of the WH-phrase is excluded. Since che and i bambini are both arguments and form different constituents it is rather obvious that one must be a subject and the other an object. The choice which one is the subject and which one the object, is semantically determined: a piano can be played by children, but children cannot be played by a piano, so che is interpreted as the object, whereas i bambini is decided to be the subject. Thus, the syntactic impossibility of having an element intervening between spec C' and C does not seem to be as problematic as the article that intervenes between WH and NP, in terms of comprehension of the meaning of the sentence.

Supposing that children of about six years old are very close to their target (= adult) grammar, it is plausible to assume that they make similar reasonings, that is, they can interpret (10) - (15) as WH-movement of the object, although the syntactic structure is not allowed. However, their grammar still seems to be more flexible, since they allow subject interpretations as well, sometimes (Table II). It seems that the article between the WH-element and the NP is not as much an obstacle as it is for adults. This might be due to the fact that the language specific properties of the Italian article have not been completely

acquired yet. I admit that the latter explanation is rather tentative, and definitely deserves a deeper analysis, which lies, however, beyond the scope of this paper.

Another notable phenomenon are the "perché" interpretations.

Table I as well as Table II show that sometimes the questions were neither given object, nor subject interpretation, but were responded by an answer, introduced by perché (= because), which demonstrates that the concerning WH-phrase/element is assumed to be perché (= why) instead of che (= what) by the child. Why would the child do this?

Note that there is a significant difference between Table I and Table II as regards the "perché" interpretations. Only four of the 22 children gave a "perché" answer to the questions without articles, whereas 10 out of 22 responded with "perché" answers to the questions with articles. Furthermore, the major part of the "perché" interpretations in Table I occurs below the "age-line" of 3;9, whereas Table II shows "perché" interpretations at all age ranges. According to me the "perché" interpretations must be considered as an escape from ungrammaticality. For children until about 3;9 both subject and object interpretations of questions like (9) - (14) are compatible with their grammar. Therefore, there is no direct need to create another answer, in order to escape from a syntactically impossible structure. After 3;9 the possible answers become more restricted, since object answers are ruled out by their further developed grammar. This could explain why we find a few more "perché" interpretations at this age, although subject interpretations clearly prevail. Table II shows that children of all ages are sensitive to the intervening article. Object interpretations are allowed by the younger children's syntax, which is confirmed by the many object answers. Subject interpretations however, are more problematic, because the article forms an obstacle to consider che + article + NP as one constituent (although this obstacle does not seem insurmountable for several children). After 3;9 also the object interpretation becomes syntactically impossible. In general, we could say that the structure of questions as in (10) - (15) gives the child less possibilities for a correct answer than the questions in (9) - (14) and therefore it "escapes" more often from the restrictions of their own grammar by giving a "perché" interpretation<sup>13</sup>.

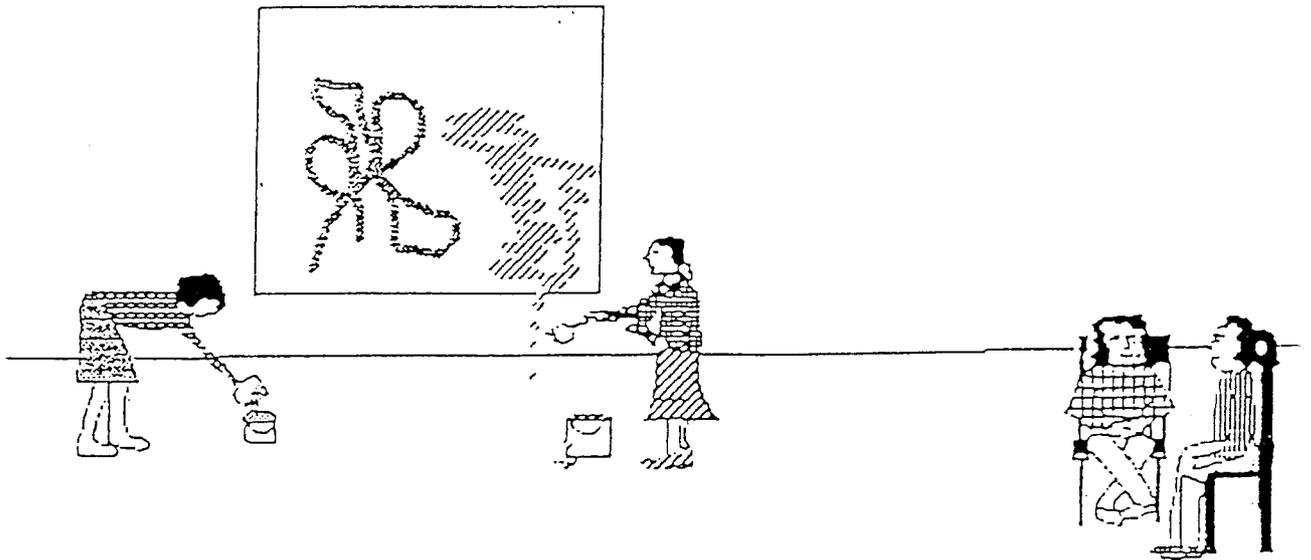
Finally, we should be aware of the fact that from a phonetical point of view, the words che and perché are very similar, and that the possibility that the child simply heard "perché" instead of "che" is not excluded.

PICTURES CORRESPONDING TO THE STORIES AND QUESTIONS IN (4) - (15)

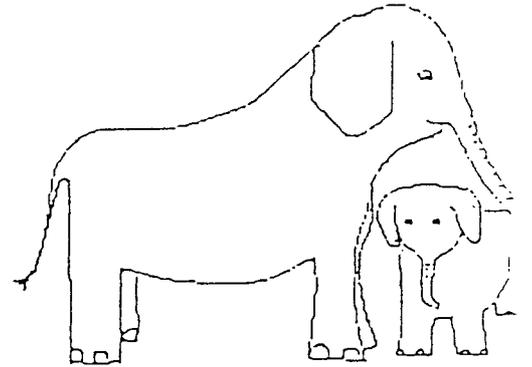
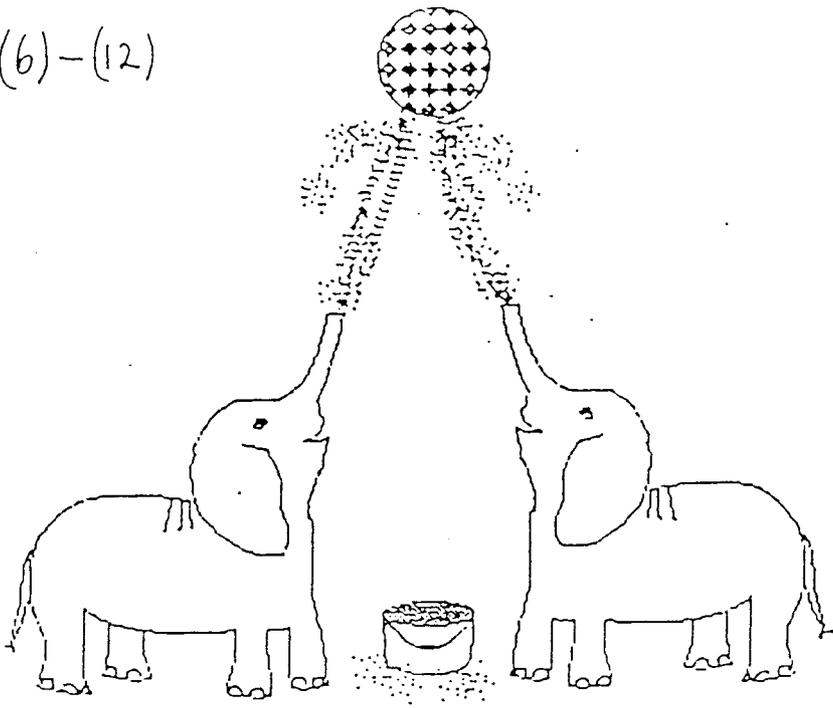
(4) / (10)



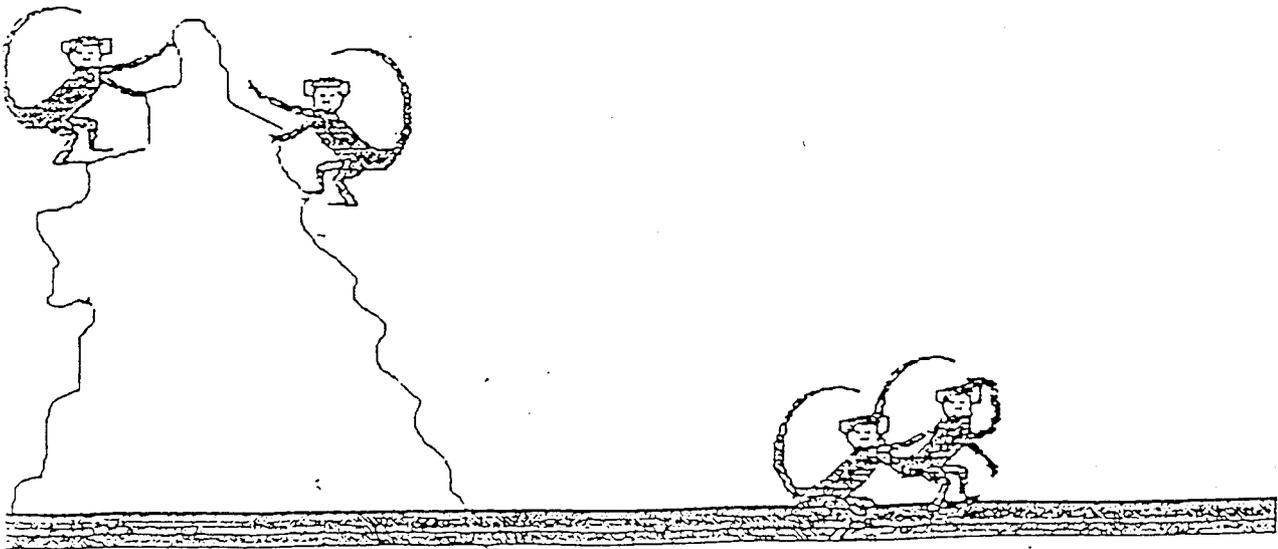
(5) / (11)



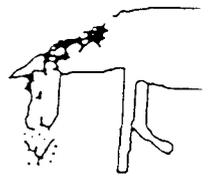
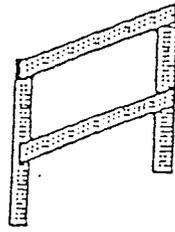
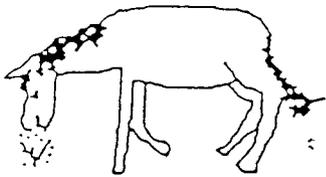
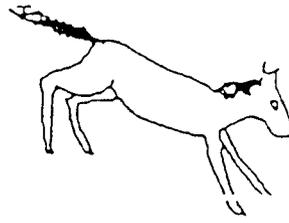
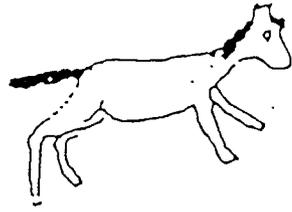
(6)-(12)



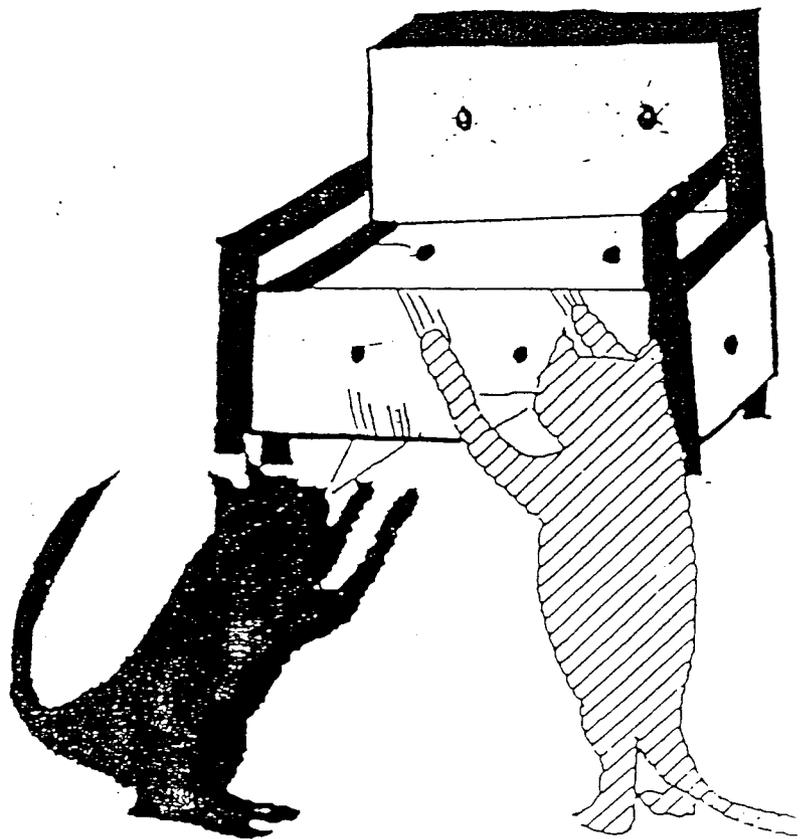
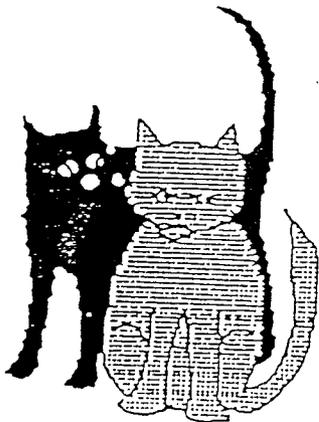
(7)/(13)



(8) - (14)



(9) - (15)



## Notes

1. I would like to thank:
  - the children and the teachers of the "Scuola Materna Comunale Duca D'Aosta - Giudecca" in Venice, Italy, for their cooperation and enthusiasm during the experiments;
  - Guglielmo Cinque, Giuseppe Longobardi, Cecilia Poletto, Nina Hyams and Zvi Penner for their useful comments;
  - Elena Pizzuto and Virginia Volterra for making their data available to me;
  - the "Nederlands Instituut te Rome" and the "Fundatie van de Vrijvrouwe van Renswoude te 's Gravenhage" for making this research financially possible.

2. The trick of this kind of questions lies in the fact that che can be considered either as a specifier of the NP bambini:

[<sub>spec</sub> C' [<sub>spec</sub> N' che] [<sub>N'</sub> bambini]]  
[<sub>C'</sub> stanno suonando?]

or as a pro-NP of the WH-type:

[<sub>spec</sub> C' [<sub>NP</sub> che]] [<sub>C'</sub> bambini stanno suonando?]

Note, however, that only the former structure is grammatical in adult Italian.

3. As pointed out by Rizzi (1991); Poletto (forthcoming), among others, in Italian there exists an asymmetry between perché (=why) and the other WH-elements (argumental or not), in that the former does not require adjacency to the inflected verb:

(i) Perché Gianni ha parlato?

why Gianni has spoken

(ii) Perché ha parlato Gianni?

why has spoken Gianni

Along the lines of Kayne (1989), Benucci (1991), Poletto (forthcoming) a.o., this phenomenon can be accounted for by assuming that the WH-item perché actually consists of a preposition per (=for) and of a complementizer che (=that). This implies that V-to-C becomes impossible: C is already filled by a complementizer.

4. Note that a sentence like (i) is excluded in ordinary style adult Italian:

(i) \*Che cosa ha Gianni mangiato?

A possible explanation would be to claim that the sequence aux + past participle forms a unique constituent of level X<sup>0</sup> which is moved to C as a whole. According to Rizzi (1991) this is not very plausible for several reasons (e.g. adverbs and floated quantifiers can intervene between the auxiliary and the past participle). Therefore he proposes another explanation based on Rizzi &

Roberts' (1989) account for similar phenomena in French: if Agr in Italian only assigns nominative case in the spec-head configuration, movement of I to C destroys the required configuration, and an overt subject cannot survive in the Spec I' position, because of the Case Filter. To account for the possibility of (2a) Rizzi has to assume that an independent assigner of nominative case is available for a postverbal subject.

5. The source of the presented pictures and questions is formed by Jill Devilliers' and Tom Roeper's WH-Experiments with English children.
6. Although Rizzi makes an exception for Italian in claiming that [+WH] is borne by C in embedded and by I in main WH-clauses (he claims WH to be on I in both) I follow Poletto (in preparation) in assuming that, like in English, [+WH] is carried by C in embedded, but by I in main WH-questions. She argues for this by means of independent evidence with respect to the position of the subject. However, it would go beyond the scope of this paper to go into the details of this proposal.
7. It may strike you that there is no I-projection involved in these structures. I will clarify this in section 3.5. It implies that there is no V-to-I movement either in Italian child language.
8. The idea of considering the subordinate clause as the analytic domain is supported by many child language researchers, such as Zvi Penner, Ger de Haan and Jacqueline Frijn, Juergen Weissenborn, Nina Hyams, Tom Roeper. Note, however, that this is just an observation, without explanatory value.
9. For Dutch, it has been argued extensively that the topic is not in spec C', but in a position outside CP, bound by an empty operator in spec C'. Topic and CP are dominated by a node that Weerman calls "E" (= Expression). Since this Dutch/German particularity is not relevant for this paper, I left it out.
10. As you may have noticed, Weerman does not assume I to have a full projection. According to him, this logically follows from X-bar theory: only those categories that assign some sort of DS-role are allowed to project. C assigns mood at DS to VP, but I has no such function. Therefore, I does not project. All abstract functions that are usually associated with I or IP are captured by COMP (see also Jaeggli (1982) a.o., for related ideas).
11. Data from two different corpuses: the CHILDES corpus at the CNR, Rome; collected by Virginia Volterra and

Paola Tieri; put into the CHAT system by Elena Pizzuto and Simona d'Amico, and the corpus collected by Giovanna Tirondola, Università degli Studi di Padova.

12. Note that in the object interpretable structure, the NP bambini can no longer occur as a bare noun; it has to be accompanied by a determiner.
13. Recall also the asymmetry between perché and the other WH-elements in Italian: perché does not cause V-to-C movement whereas the other ones do (cf. note 2). This means that a sentence like  
"[\_spec c Perché] [bambini stanno suonando]?"  
is more acceptable than  
"[\_spec c Che] [bambini stanno suonando]?"  
for Italian adults.

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# **COMPUTING DISCOURSE ANAPHORA FROM GRAMMATICAL REPRESENTATION**

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Computing, CUP, London, with the same title)

## **Abstract**

The paper presents an implemented algorithm to compute anaphora resolution and coreference, relatively to pronominal and nominal expressions in discourse. The algorithm works on the output of other modules: the parser and its associated module for pronominal binding within the sentence (see Delmonte & Bianchi, 1991); the module for scope assignment to quantified expressions (see Bianchi & Delmonte, 1989a; Delmonte, 1990); the module for inferential processes based on KL-Prolog (Adorni et al., 1987). Our model is strongly syntactically based: in particular, access to the modules is guided by the grammatical basis of the computation, the two remaining modules being triggered by specific items: the presence of quantified indefinite expressions, of universal quantifiers or generic expressions for the module of scope assignment; the failure of some referring expression to be picked up as Main Topic, thus conflicting with evaluation procedures independently set up by the algorithm, as the need to set up an adequate plural antecedent for a plural pronoun or noun to corefer. As to inferential processes, these are only activated at a given state whenever the scoring procedures independently set up by the algorithm require a nominal expression to corefer in the text. They can also be triggered in a given state whenever the system is in an ambiguous context: one or two pronouns to be coreferred and no MAIN or SECONDARY TOPIC.

## **0. INTRODUCTION**

When understanding or producing discourse or text, human beings must follow strictly some general principles underlying the distribution of information which include not only coherence but also what might be regarded as biologically set mental constraints. These constraints determine the amount of information which may be computed at a given time when reading or listening to texts. In particular, any given text introduces one or more TOPICS of discourse or themes and builds up on it a structurally and semantically coherent argumentation which consists both of generic and specific descriptions, personal or generic evaluations, expansions and so on. It is a fact, that a human being cannot possibly follow this textual processes for more than one or two TOPICS at a time, even though he may well temporarily store the information related to a previously discussed TOPIC in a memory storage.

In our algorithm, we activate only two TOPICS at a time which may either be an EXPECTED and a POTENTIAL TOPIC in case the text just starts being organized; or, a MAIN and a SECONDARY TOPIC, in case the text has already started. Pronominal and nominal expressions introduced at a given point are computed accordingly. They may either CONTINUE a Main or Secondary Topic or they may contribute to turn an Expected and/or a Potential Topic into a Main Topic. Secondary Topics may only arise whenever a given nominal expression has already been used as Main Topic and is then temporarily stored into memory.

## **1. PRONOMINALS**

### **1.1 Accessibility and referring**

Following M. Ariel (1988) we believe that referential expressions are processed in a certain way according to their inherent definition or classification in terms of referential features: these in turn determine when a referring expression must be processed, if an anaphor as soon as possible - and we compute anaphors at sentence level only, whether it can act as antecedent or not and whether it is dependent on its reference on other expressions or whether it is free. A pronoun is free in a certain domain, but a noun or a proper noun is free anywhere. The context taken into account is viewed in terms of accessibility of the referent to the addressee. In case a referential expression requires Knowledge of the World, this is less accessible than previous linguistic material, which alone can provide the higher degree of accessibility for a given referent. In turn, a referential expression must be

a noun or a proper noun in case of ambiguity: in a stretch of discourse, whenever a pronoun is not usable because it can cause incoherence, being ambiguously referable to one or the other antecedent, then a noun or proper noun must be introduced.

We might consider the following properties as relevant for a separation of P or pronominal elements into classes according to a feature system, where the 0 property is the basic one distinguishing Anaphors from Ps:

- 0. can corefer in the discourse
- 1. can be assigned arbitrary reading
- 2. can be bound to a quantifier or a quantified NP
- 3. can be used for contrast and emphasis
- 4. can take split antecedents

Italian differs from languages like English because it possesses a greater number of lexical items to express the properties listed above. For instance, English has only one kind of pronoun to express properties 2, 3, i.e. lexical pronouns; and another kind of pronominals which expresses property 1 - i.e. big Pro. Only non anaphoric pronominals possess property 4. In English, contrary to what expected, 1st and 2nd person reflexives can be bound in the discourse; 3rd person reflexives can be bound in the discourse according to Zribi-Hertz(1990) principles of the Subject of Consciousness as antecedent and Domain of Point of View as discourse relevant domain.

As to properties 2,3, whereas English merges them within a single class, Italian splits them into two different classes: one kind of pronominals expresses properties 3 - i.e. independent lexical pronouns. Another kind of pronominals expresses property 2 - i.e. little pros and clitics. In turn, clitics and little pros can be treated as syntactic variables and be bound at c-structure level: in this case they would be seen as part of a syntactic chain. Possessing a higher number of lexical items, Italian has as a counterpart a more restrictive system of referentiality: reflexives cannot be used logophorically. Thus, it would seem that a system for pronominal binding in English would necessarily require the computation of discourse structure, with a Subject of Consciousness and a Domain of Point of View. Italian, on the contrary allows modularity to the system, keeping sentence level separated from discourse level analysis.

## 1.2 The syntactic and semantic basis

The f-structure representation that we produce is richer than the one proposed in the literature even though it is strictly within the basic theoretical framework. In particular, we use a lexical form which records both the syntactic constituent, the grammatical function and the semantic role associated to a given argument of a predicate; in addition, the semantic role is further specified by a list of inherent features. It could be argued that some of this information is redundant, in view of the fact that an Agent may only be a SUBJECT and in turn a SUBJ may only be an NP: however this is not always the case, as happens with SUBJECT infinitives. Besides, open functions, XCOMPs which encode the same information as small clauses in a configurational approach, are assigned a major constituent in the grammar rather than in the lexicon, on the basis of the principle that X ranges over lexical heads and that the parser instantiate the appropriate c-structure representation accordingly.

Another important difference is constituted by the attribute `lex_form`, which records the grammatical processes undergone by the lexical entry when the parser analyses the sentence. In particular, a transitive verb like "muovere"/move, may undergo "inchoativization" and the output of this lexical redundancy rule is recorded in the `lex_form` associated with the parse, where the underlying `obj/theme_nonaff` has been turned into the `subj/theme_nonaff`, as shown by the following example taken from the story which we will comment at length below,

```
5. [la,casa,non,si,mosse,di,un,solo,palmo]/the house did not move an inch
net(po21)
index:f7
pred:muovere
lex_form:[np/subj/theme_nonaff/[oggetto, strumento]]
mood:ind
tense:pass_rem
cat:risultato
subj/theme_nonaff:index:sn106
      cat:[oggetto, luogo]
```

```

pred:casa
gen:fem
num:sing
spec:def:+
tab_ref:[+ ref, - pro, - ana, + class]
adjs:neg:non
adj/measure:sem_mark:di
obj/measure:index:sn122
  cat:[misura, luogo, oggetto]
  pred:palmo
  gen:mas
  num:sing
  spec:def:-
  mods:cat:[misural _]
  pred:solo
  gen:mas
  num:sing
  tab_ref:[+ ref, - pro, - ana, + class]
aspect:achiev_tr

```

Another important feature present at the level of f-structure is the output of the binding module. In line with LFG and other generative theoretical frameworks, pronominal expressions, morphologically expressed or unexpressed are bound at various levels of representation: functionally controlled ones are bound at lexical or structural level by the parser which produces as output a list of annotated c-structures, where controlled PROs are associated with their antecedents. Arbitrary PROs on the contrary, cannot be assigned antecedents being generic in reference (see Delmonte and Bianchi 1991). Generic readings are also produced whenever a pronoun is in a chain with a quantified antecedent and tense is not specific: this is computed at sentence level by a module of interpretation.

A second set of pronominal expressions, those which can be bound sentence internally, are computed by a binding module which follows the lines traced in LFG for 'anaphoric control': in addition, since Italian possesses a much wider variety of pronouns than English, rules for deictic pronouns, independent pronouns or contrastive pronouns, as well as for possessive reflexive ones (also called long anaphora) are also specified in terms of Functional Structures.

The module for pronominal binding operates strictly sentence internally and also specifies which pronouns must be given external reference, these being the object of analysis of the present algorithm. Subordinate sentences are dealt with by the binding module, since f-command is still a viable tool for domain accessibility and allows to treat differently structurally different sentences: in particular, the subordinate may precede the main clause or it may follow it thus resulting in a different configuration for antecedents and pronominals as we discuss in Delmonte and Bianchi 1991. Coordinate clauses are dealt with by a special module which allows to dispense with f-command, since no particular restriction seems to result from this kind of configuration, apart from precedence. It is a well known fact that binding of pronominals by means of a quantified antecedent may take place as long as precedence is respected: this is particularly true in Italian; on the contrary English allows backward chains to be realized (see Carden 1982).

There are differences which distinguish a language like Italian where verbal agreement morphemes can be used referentially and are instantiated into an empty 'pro' or Null Subject; from a language like English where the same morphemes must be computed as non-referential and a NS can only occur in specific contexts, e.g. as subjects of a conjoined proposition. Moreover, English can use a personal pronoun deictically or contrastively provided it is strongly stressed whereas Italian possesses a different lexical variety for the same case. Besides, non-subject pronouns in a language like Italian can become clitics - enclitics or proclitics, and can be bound within their utterance or in the discourse according to structural constraints.

Broadly speaking, one could say that Italian is a language structurally underdetermined but referentially overdetermined in the sense that the syntactic structure of Italian is highly ambiguous whereas the referential processes set up both at sentence and at text level are very well determined. The contrary may apply to English, which is structurally overdetermined and referentially underdetermined. It is a well known fact that English always requires a SUBJECT to be lexically expressed in preverbal position whereas Italian and Romance languages

do not require it. Rather, they have a principle of pro-drop which allows the SUBJECT to be left lexically unexpressed or to be inverted in postverbal position. Consider the following example:

6 i. pro Noto\_ che pro non era solida

ii. He noted that it was not solid.

The Italian version in i. has two little pro's where the English version uses two different pronominal forms, a personal form 'he' pointing to a third person human antecedent and 'it' indicating a non human antecedent. No coreference would result between the two pronouns when the binding module is activated. However, the Italian sentence only makes available an empty category with third person specification, more features should be provided by the grammatical module. In particular, verb subcategorization would assign a human semantic feature to the first pro in force of the fact that a SUBJECT for the verb NOTE has to be 'human'. However, the second pro is associated to the SUBJECT of a copulative verb, BE, which only indirectly governs this function. According to LFG, an indirectly governed function is deprived of semantic features and is interpreted in the predicate, which in our case is the adjectival SOLID. Our system would provide the little pro of semantic features percolating from the SUBJECT of the predicate adjectival SOLID, and transmitting via Lexical Functional Control its features, Person Number and Gender to the controller, the non thematic SUBJECT, which happens to be an empty category, deprived of a lexically expressed element - a variable in prolog. Only in this way, binding is prevented to apply and no coreference would result between the two empty categories. This is clearly shown in the f-structure representation for the sentence here below,

7. [esso,si,mise,ad,osservare,attentamente,la,casetta,e,noto\_,che,non,era,davvero,molto,solida]/he began to observe the house very carefully and he noted that it was not very solid indeed

net(po13)

```

main/prop:index:f18
  coord:index:f5
    pred:mettersi
      lex_form:[np/subj/actor/[umano,animato],vpinf/vcomp/prop/a/[subj=subj/actor,subj=x]]
      mood:ind
      tense:pass_rem
      cat:attivit a
      subj/actor:index:sn21
        cat:[animato]
        pred:esso
        pers:3
        gen:mas
        num:sing
        case:[nom]
        spec:def:+
        tab_ref:[+ ref, + pro, - ana, + me]
        antecedent:external
        interpretation:specific
      vcomp/prop:index:finf1
        pred:osservare
          lex_form:[np/subj/experiencer/[umano,animato],np/obj/theme_nonaff/[_ _]]
          mood:inf
          tense:pres
          cat:percettivo
          subj/experiencer:index:sn45
            cat:[umano]
            pred:pPro
            binder:sn21
            tab_ref:[+ ref, + pro, + ana, - me]
            interpretation:specific
          obj/theme_nonaff:index:sn43
            cat:[oggetto, luogo]
            pred:casa
            gen:fem
            num:sing
            spec:def:+
            mods:cat:[oggetto| _]
            pred:piccolo
            gen:fem
            num:sing
            tab_ref:[+ ref, - pro, - ana, + class]

```

```

      adjs:adj/modal:pred:attentamente
      aspect:activity
    aspect:activity
  coord:index:f10
  pred:notare
    lex_form:[np/subj/experiencer/[umano, animato], s/scomp/prop/[subj=subj/experiencer, subj=x]]
  mood:ind
  tense:pass_rem
  cat:risultato
  subj/experiencer:index:sn48
    cat:[umano, animato]
    pred:pro
    pers:3
    gen:mas
    num:sing
    caso:[nom]
    spec:def:+
    tab_ref:[+ ref, + pro, - ana, - me]
    antecedent:sn21
    interpretation:specific
  scomp/prop:index:f16
  pred:essere
    lex_form:[np/subj/theme_bound/[_ ]_,acomp/prop[_ ]_]
  mood:ind
  tense:imp
  cat:esistenza
  subj/theme_bound:index:sn49
    cat:[oggetto, strumento]
    pred:pro
    pers:3
    gen:fem
    num:sing
    caso:[nom]
    spec:def:+
    tab_ref:[+ ref, + pro, - ana, - me]
    antecedent:sn43
    interpretation:specific
  acomp/prop:index:saa2
    cat:[valutativo]
    pred:solido
    gen:fem
    num:sing
    subj/prop:sn:index:sn51
      pred:vbl
      binder:sn49
      adjs:int:molto
    adjs:neg:non
    adj/focal:pred:davvero
  aspect:state
  aspect:achiev_tr

```

Coming now to pronominal expressions, Italian possesses a higher variety of lexical forms performing different functions. In line with Bresnan et al(1985) and contrary to the proposal contained in Dalrymple(1990) we use functional features as lexically specified properties of individual anaphoric elements. These features both account for and translate lexical category, in this way directly triggering the binding algorithm. Features also serve to restrict the type of possible antecedents in terms of reference to the SUBJECT; to set up a hierarchy for antecedenthood in which possible antecedents are ranked according to their associated grammatical function and thematic role; to unify morphological features checking for agreement in person and number, and selectional restrictions imposed by inherent semantic features; to tell apart quantifiers and quantified NPs which cannot be used as antecedents in backward pronominalization. A complete list of features is given below which we comment here briefly: all elements marked +ref can be treated as antecedents in the discourse; the second feature is definiteness which can take on three values  $\pm$  and 0 which is introduced when no determiner precedes the noun or pronoun; the third feature is partitivity and is used to set quantified expressions apart from non quantified ones: +part is associated to all partitive quantifiers and quantified NPs, -part is used for universal quantifiers which in turn may be definite or indefinite. The fourth feature is  $\pm$ pro and sets apart nominal expressions from

pronominal expressions; the fifth feature is  $\pm$ ana and sets apart anaphoric elements which can be bound sentence internally, from non anaphoric ones. Finally the sixth feature varies from  $\pm$ class to  $\pm$ me: now, where the one applies the other cannot apply. In particular  $\pm$ class is used to set apart common nouns which individuate a class from proper nouns which serve to name an individual; on the contrary,  $\pm$ me is only used for pronominal expressions and differentiates morphologically expressed pronouns from morphologically unexpressed ones. A seventh feature appears with anaphors to distinguish long distance anaphors which are subjective from the ones which are not.

### 1. Table of referential features and categories

referentiality([+ref, $\pm$ /0 def, $\pm$ part,-pro,-ana,+class],1). /\* common noun \*/  
referentiality([+ref,nil,nil,-pro,-ana,-me],1). /\* vbl \*/  
referentiality([+ref, $\pm$ /0 def,nil,-pro,-ana,-class],0). /\* proper noun \*/  
referentiality([+ref,nil,nil,+pro,+ana,+me],6). /\* clitic \*/  
referentiality([+ref,nil,nil,+pro,-ana,+me],3). /\* lexical pronoun \*/  
referentiality([+ref,nil,nil,+pro,-ana,-me], 3). /\* little pro \*/  
referentiality([-ref,nil,nil,+pro,+ana,+me,+subj],9). /\*long reflex \*/  
referentiality([-ref,nil,nil,-pro,+ana,+me],9). /\* short reflexive \*/  
referentiality([+ref,nil,nil,+pro,+ana,-me],4). /\* big PRO \*/  
referentiality([+ref, $\pm$ /0 def, $\pm$ part,-pro,-ana,+me],10). /\* pro quantif \*/  
referentiality([-ref,nil,nil,-pro,+ana,+me],8). /\* relative pro \*/  
referentiality([+ref,nil,nil,-pro,+ana,+me],8). /\* interrogative pronoun \*/  
referentiality([-ref,nil,nil,+pro,+ana,+me,-subj],8)./\* possessive anaphor \*/  
referentiality([+ref,nil,nil,+pro,-ana,+me],7)./\* possessive pronoun \*/

### 2. THE ALGORITHM

To establish coreference for a pronominal expression, the main topic of discourse must be established. As for terminology, we use topic of discourse(see Bullwinkle 1977) rather than focus, an attribute which we keep for non-argument grammatical functions, which in line with LFG are derived by grammar rules at sentence level and are FOCUS TOPIC ADJUNCT MODIFIER. The algorithm for discourse analysis takes a sentence at a time and looks for antecedents to pronominals which have been assigned to an EXTERNAL referent by the binding algorithm at sentence level.

We proceed then, on the basis of the following principles:

8. there is only one possible TOPIC of DISCOURSE which may be assigned as the MAIN TOPIC for each sentence;
9. there may be another topic which is assigned as SECONDARY TOPIC and may be computed together with the MAIN for each sentence;
10. TOPICS may be changed according to the states of the discourse model: in this case we follow Brennan's(1986) approach to centering, even though we use a different set of states.

The algorithm starts by extracting a list of all referential expressions from the sentence under analysis; then, it proceeds by substituting all referentially bound NP heads with the head of their antecedents. Supposing now that we start from the first sentence of a text or discourse, we are now ready to establish the EXPECTED MAIN TOPIC of discourse from the referential expressions made available by this list. In order to do this, at first we look for specific structural information, like a Presentative sentence in which the SUBJECT is presented or introduced into the discourse by means of a specific structural configuration like a 'there' sentence or a locative inverted structure; in lack of this structure, we assign scores to the NPs included in the list and consequently choose from among the Weighted List the NP which has been assigned the highest score. To assign scores we proceed as follows:

11. we compute the distance of a given NP from the root of the graph of the sentence because we intend to privilege as possible TOPICS those NPs which are positioned at the higher levels;
12. we assign scores according to thematic or semantic roles and grammatical functions according to the following hierarchy:

AGent<CAUSer<EXPeriencer<PERCceiver<CAUSer\_emotional<Goal<Patient<LOCative<THeme\_Affected<T  
Heme\_Effected<THeme\_Unaffected

As to ADJuncts, we also established a hierarchy since we take INSTRumental to be more relevant than MODal or TEMPoral ADJuncts. Note that AGent subsumes other semantic roles like POSSessor, SOURce\_Info, INSTtigator, etc.; GOAL subsumes ADDressee; THeme\_Unaffected subsumes POSSEsion, INFOrmation, LOCAtion etc.

As to grammatical functions, the nuclear functions come first, i.e. SUBJect OBJect and OBJect2, then we have OBLique and ADJuncts. Only referential arguments are imported at this level since non-referential ones cannot become the object of coreference (or co-specification, in Sidner's terms) in subsequent discourse. This subdivision is readily made available in LFG at the functional level, in particular because the theory distinguishes between open and closed functions (see Bresnan 1982).

13. After NPs have been weighted, we proceed by ordering them and then we sort NPs which have the same head erasing from the list occurrences of the same NP which have received a lower score. At this point, a semantic filter is applied, so that pruning deletes those referring expressions which have been assigned a score lower than a given threshold. The pruned list becomes the Weighted List, in which all referential expressions have been ordered according to their scores.

14. The Weighted List contains information as to the probability that a given NP may become the MAIN TOPIC of discourse. However, when computing the first sentence of discourse or text, only the EXPECTED Topic can be computed: the remaining NPs are assigned to OTHER Topics, a list from where a referential expression may be picked up in case the EXPeCted Topic is not reinforced. Two more slots are available as output of the computation: a SECONDARY Topic which is a TOPic scoring lower than the MAIN Topic, and has the highest probability to become a MAIN Topic in the following sentence in case a change of state in the main algorithm takes place.

15. After an EXPeCted Topic has been computed, a reinforcement is required in the form of a pronominal: only in this way a MAIN Topic may ensue.

Following Sidner's Expected Focus Algorithm (1983, 287), our algorithm chooses an expected topic which must be reinforced in the following sentence; however this topic may also be rejected. While the expected focus algorithm can always choose an expected focus, its choice may have to be rejected because the default position is overridden by other factors. Typically, this occurs when a pronoun, which does not co-specify with the expected focus, is used in the second sentence of the discourse, and no anaphors is used to co-specify with the expected focus. Whenever an anaphor is encountered, the current Main Topic, if already established, or else the Expected Topic is tested as coreferent with (or co-specifier for) the anaphoric expression. It has to satisfy syntactic agreement with the list of grammatical features, as well as selectional semantic restrictions represented both by inherent features, and thematic roles compatibility.

### **2.1 States of the Algorithm**

The algorithm may assume four main states:

- a. CONTINUING: indicating that all the TOPICS of the current sentence correspond to those already fixed for the previous sentence, and the individual/s referred to is/are exactly the same one/s;
- b. RETAINING: this state precludes to a possible change of discourse TOPIC, when in the current sentence a new TOPIC has been introduced as SUBJ in the form of a lexical nominal expression;
- c. SHIFTING: indicating an abrupt change of discourse TOPIC due to the spotting of a particular structural configuration, like an inverted subject or a 'there' sentence.
- d. CHANGING: this is the state ensuing from a change of discourse TOPIC.

Minor states of the algorithm may arise with,

- a.1 RESUME: whenever a Secondary Topic is resumed after a CHANGING has taken place and is introduced as Main Topic;
- d.1 CHANGE\_ANALYSE: whenever a deictic demonstrative pronoun or a nominal substitute is used which varies both the lexical head of the antecedent and establishes a set membership relation with it.

### **3. TOPIC SHIFT AND FOCUS**

When a Main Topic is established new topics can be added or there can be a topic SHIFT. To add new topics it is sufficient to connect the subject of a sentence to a previously mentioned POTENTIAL TOPIC. Expected topics are all noun phrases used non-predicatively. A SHIFT or Topic Movement can take place only by means of overt syntactic structures, being instantiated by LFG non argument functions such as TOPIC and FOCUS for fronted constituents - i.e. for constituents which have been clefted, dislocated, extraposed, topicalized and so on. TOPIC and FOCUS in fact are discourse markers which can be used directly in our algorithm without any further elaboration. A FOCUS constituent is the trigger for TOPIC SHIFT and causes two things to happen: i. the previously established Main Topic is demoted to SECONDARY TOPIC, a role which will be explained below; ii. the FOCUS constituent is automatically raised to MAIN TOPIC without the need to wait for it to be reinforced.

The SECONDARY TOPIC is a repository for constituents which have been previously used as Main Topics and may be reintroduced in the following discourse. In case the shifted topic is not 'reinforced' in the following sentence and reference to the previous Main Topic is activated by means of SUBJECT noun phrase, the Secondary Topic may be restored to its previous role. The other important function that Secondary Topic fulfils in our system is the possibility of having more than one referential expression to corefer to, and bind, pronouns and anaphors. When this happens the Main and the Secondary Topic are the more plausible candidates. The stack containing Potential Topics is renewed with each new sentence analysed. Theoretically, the algorithm works according to the following,

#### D. PRINCIPLES OF PRAGMATIC BINDING

- a. Only an OBJECT can bind a TOPIC OF DISCOURSE in the following sentence;
- b. Only a FOCUS can be used to introduce a new TOPIC OF DISCOURSE;
- c. Only SUBJECTS can bind the TOPIC OF DISCOURSE from the following sentence;
- d. Only the TOPIC OF DISCOURSE can bind the SUBJECT in the following discourse;
- e. Use a pronominal to bind.

We can use Bresnan's(1990) examples to show how these principles work:

16.i. I'm looking for my friend Rose.

- ii. ≠Among the guest of honour was sitting Rose.
- iii. Rose/She was sitting among the guest of honour.

17.i. Where's Rose?

- ii. Among the guest of honour was sitting HER / \*she/\*her /\*Rose
- iii. Rose/She was sitting among the guest of honour.

### **3.1 Neutralization**

#### **3.1.1 Deictic pronouns**

A number of interesting phenomena can be covered by an adequate grammatical representation and they concern discourse bound referring elements like deictic pronouns, quantified expressions and nominal expressions with an indirectly governed function. Discourse bound pronominals can be divided up into different types (partially following Bosch 1981): anaphoric ones, 'which continue or sustain a previously established focus towards a specific item which he had oriented his attention to before'; deictic ones, 'which are a means for achieving the focussing... of the attention towards a specific item which is part of the respective deictic space'(ibid.,68).

The use of deictic pronouns is quite common in texts and ranges from first and second person personal subject pronouns, to deictic demonstrative pronouns like 'this' and 'that', which in Italian can be used to corefer both with a human referential antecedent and with a non referential sentential antecedent - differently from what happens in English (see Halliday and Hasan 1975, 63). Here are some examples taken from the story of 'The Three Little Pigs', made up of 25 sentences which we computed entirely. We discuss the first five sentences in their Italian version. Literal translation is provided also below. This is the English translation: '1.Once upon a time there were three brothers little pigs who lived happily in the countryside.2.But in the same place lived a wicked wolf who fed precisely on plump little pigs.3.The little pigs therefore decided to build a small house each, to protect themselves from the wolf.4.The oldest one, Jimmy, who was wise worked hard and built his house with solid bricks and cement.5.The others, Timmy and Tommy, who were lazy and idle settled the matter

hastily and built their house with hay and little pieces of wood. We show the f-structure as output of the binding module at sentence level, and then the output of the discourse module.

18. [ci,erano,una,volta,tre,fratelli,porcellini,che,vivevano,felici,nella,campagna]/There were one time three piglets

who lived happy\_plur/mas in the countryside

net(po1)

index:f18

pred:essere

lex\_form:[np/subj/thema\_bound/{umano| \_}]

mood:ind

tense:pres

cat:esistenza

subj\_foc/theme\_bound:index:sn272

cat:[umano, animato, relazionale]

pred:fratello

gen:mas

num:plur

spec:def:0

part:+

card:tre

mods:mod/predic:topic:topic\_type:relative

index:sn274

cat:[umano, animato, relazionale]

pred:pPro

pers:mas

gen:plur

num:3

case:[nom]

binder:sn272

tab\_ref:[+ ref, + pro, + ana, - me]

antecedent:sn272

interpretation:specific

index:f21

pred:vivere

lex\_form:[np/subj/actor/{animato| \_}, pp/obl/locative/in/{luogo}]

mood:ind

tense:imp

cat:esistenza

subj/actor:index:sn275

cat:[animato| \_]

pred:pro

pers:3

gen:mas

num:plur

case:[nom]

spec:def:+

binder:sn274

tab\_ref:[+ ref, + pro, - ana, - me]

antecedent:sn274

interpretation:specific

obl/locative:index:sn298

cat:[luogo]

pred:campagna

gen:fem

num:sing

spec:def:+

tab\_ref:[+ ref, - pro, - ana, + class]

adjs:adj/emotivo:index:saa3

cat:[emotivo]

pred:felice

gen:mas

num:plur

subj/nil:sn:index:sn299

pred:vbl

binder:sn275

aspect:state

adjs:noun\_mod:index:sn273

cat:[edible, animato]

pred:porcellino

```

      gen:mas
      num:plur
      spec:def:0
      tab_ref:[+ ref. - pro, - ana, + class]
    tab_ref:[+ ref, - pro, - ana, + class]
form:ci
adjs:adj/temporale:sem_mark:nil
obj/punct:index:sn270
  cat:[tempo, ripetizione]
  pred:volta
  gen:fem
  num:sing
  spec:def:-
  tab_ref:[+ ref, - pro, - ana, + class]
aspect:state

```

and this is the output of the discourse module,

```

ref_ex(sn272, porcellino, [+ ref, 0 def, + part, - pro, - ana, + class], nil, mas, plur, [animate,edible], subj
_foc/theme_bound)/3
ref_ex(sn298, campagna, [+ ref, + def, nil, - pro, - ana, + class], nil, fem, sing, [place], obl/locative)/58
ref_ex(sn270, volta, [+ ref, - def, nil, - pro, - ana, + class], nil, fem, sing, [time, repetition], adj/temporal)/1070
MAIN TOPIC : ref_ex(., porcellino, ., nil, mas, plur, [animate,edible], ./.)
POTENTIAL TOPICS : ref_ex(sn298, campagna, [+ ref, + def, nil, - pro, - ana, + class], nil, fem, sing, [place],
obl/locative)
ref_ex(sn270, volta, [+ ref, - def, nil, - pro, - ana, + class], nil, fem, sing, [time, repetition], adj/temporal)
state(1, shifting)

```

Sentence one sets the algorithm in state of change but establishes the Main Topic owing to the Presentative structural configuration marked out by the presence of a Focussed Subject. However, the second sentence also contains a Focussed Subject in a configuration where locative inversion has been used: thus, the algorithm turns to shifting establishing a new Main Topic, and turning the previous Main Topic into a Secondary Topic.

19. [nello,stesso,luogo,pero\_,viveva,anche,un,terribile,lupo,che,si,nutrive,proprio,di,porcellini,grassi]/In the same place however lived also a terrible wolf who himself feeded just of piglets plump\_plur/mas

```

net(po2)
index:f3
pred:vivere
lex_form:[np/subj/actor/[ferocious! _], pp/obl/locative/in/[luogo]]
mood:ind
tense:imp
cat:esistenza
subj_foc/actor:index:sn82
  cat:[ferocious, animato]
  pred:lupo
  gen:mas
  num:sing
  spec:def:-
  foc:anche
  mods:cat:[ferocious! _]
  pred:terribile
  gen:mas
  num:sing
  adjs:adj/predic:topic:topic_type:relative
    index:sn83
    cat:[ferocious, animato]
    pred:pPro
    pers:mas
    gen:sing
    num:3
    case:[nom]
    binder:sn82
    tab_ref:[+ ref, + pro, + ana, - me]
    antecedent:sn82
    interpretation:specific
  index:f13
  pred:nutrire

```

```

lex_form:[np/subj/experiencer/[animato, umano], np/obj/theme_nonaff/[animato, umano],
pp/obl/food/di/[edible, umano, animato]]
mood:ind
tense:imp
cat:attivita
subj/experiencer:index:sn252
  cat:[animato, umano]
  pred:pro
  pers:3
  gen:mas
  num:sing
  case:[nom]
  binder:sn83
  tab_ref:[+ ref, + pro, - ana, - me]
  antecedent:sn83
  interpretation:specific
obl/food:index:sn303
  cat:[edible, animato]
  pred:porcellino
  gen:mas
  num:plur
  spec:def:0
  adjs:index:saa11
  cat:[valutativo]
  coordinate:head:coordinant
    gen:mas
    num:plur
    coord:index:saa9
    cat:[valutativo]
    pred:grasso
    gen:mas
    num:plur
    coord:index:saa10
    cat:[valutativo]
    pred:tenero
    gen:mas
    num:plur
  tab_ref:[+ ref, - pro, - ana, + class]
rifl:+
  aspect:activity
  tab_ref:[+ ref, - pro, - ana, + class]
obl/locative:index:sn81
  cat:[luogo]
  pred:luogo
  gen:mas
  num:sing
  spec:def:+
  mods:cat:[luogo|_]
  pred:stesso
  gen:mas
  num:sing
  tab_ref:[+ ref, - pro, - ana, + class]
adjs:adj/avvers:pred:pero_
aspect:state

```

and this is the output of the discourse module,

ref\_ex(sn82, lupo, [+ ref, - def, nil, - pro, - ana, + class], nil, mas, sing, [animate,ferocious], subj\_foc/actor)/3

ref\_ex(sn81, luogo, [+ ref, + def, nil, - pro, - ana, + class], nil, mas, sing, [place], obl/locative)/28

ref\_ex(sn303, porcellino, [+ ref, 0 def, nil, - pro, - ana, + class], nil, mas, plur, [animate,edible], obl/food)/60

MAIN TOPIC : ref\_ex(, lupo, , nil, mas, sing, [animate,ferocious], \_/\_)

SECONDARY TOPIC : ref\_ex(, porcellino, , nil, mas, plur, [animate,edible], \_/\_)

POTENTIAL TOPICS : ref\_ex(sn81, luogo, [+ ref, + def, nil, - pro, - ana, + class], nil, mas, sing, [place], obl/locative)

state(2, shifting)

Sentence three reintroduces both participants in the story with different roles and in different ways: the little pigs are reintroduced as SUBJECT, thus receiving a high score, by means of a demonstrative pronoun; on the contrary, the wolf is mentioned in an adjunct clause and receives a low score. As all deictic pronouns, the demonstrative

is computed both as a pronoun and as a nominal head, thus receiving the feature +class. In this case all functional features match.

20. [questi,allora,',per,protegersi,dal,lupo,',',decisero,di,costruirsi,ciascuno,'"na,casetta]/these\_plur/mas then ,to  
 protect\_themselves from the wolf,decided to build\_themselves each\_sing/mas one houselet  
 net(po3)  
 index:f9  
 pred:decidere  
 lex\_form:[np/subj/actor/[animato, umano], vpinf/vcomp/prop/di/[subj=subj/actor]]  
 mood:ind  
 tense:pass\_rem  
 cat:soggettivo  
 subj/actor:index:sn13  
   cat:[animato, umano]  
   pred:questi  
   pers:3  
   gen:mas  
   num:plur  
   case:[nom, acc]  
   spec:def:+  
   tab\_ref:[+ ref, + pro, - ana, + class]  
   antecedent:external  
   interpretation:specific  
 vcomp/prop:index:finf2  
   pred:costruire  
     lex\_form:[np/subj/agent/[animato,umano],np/obj/theme\_aff/[oggetto,luogo]]  
   mood:inf  
   tense:pres  
   cat:cambiamento  
   subj/agent:indice:sn23  
     cat:[animato, umano]  
     pred:pPro  
     binder:sn13  
     tab\_ref:[+ ref, + pro, + ana, - me]  
     interpretation:specific  
   obj/theme\_aff:index:sn21  
     cat:[oggetto, luogo]  
     pred:casa  
     gen:fem  
     num:sing  
     spec:def:-  
       subj/poss:index:sn22  
         cat:[oggetto, luogo]  
         pred:pPro  
         case:gen  
         spec:def:+  
         binder:sn20  
         tab\_ref:[+ ref, + pro, + ana, - me]  
         interpretation:specific  
       mods:cat:[oggetto| \_]  
       pred:piccolo  
       gen:fem  
       num:sing  
       tab\_ref:[+ ref, - pro, - ana, + class]  
   obj2/benef:index:sn20  
     cat:[umano, animato]  
     pred:si  
     pers:3  
     case:[dat]  
     spec:def:+  
     tab\_ref:[- ref, - pro, + ana, + me, - subj]  
     antecedent:sn23  
     interpretation:specific  
 adjs:adj/quantitativo:index:saal6  
   cat:[quantif]  
   pred:ciascun  
   gen:mas  
   num:plur  
   spec:def:+

```

part:-
  subj:nil:index:sn24
  pred:vbl
  binder:sn20
  tab_ref:[+ ref, - pro, - ana, - me]
aspect:accomp
adjs:adj/modale:pred:allora
adj:sem_mark:per
sub/prop:index:fin1
pred:proteggere
lex_form:[np/subj/agent/[animato,umano],np/obj/experiencer/[animato, umano], pp/obl/malef/da/[animato,
umano, oggetto, luogo]]
mood:inf
tense:pres
cat:attivit a
subj/agent:index:sn18
  cat:[animato, umano]
  pred:pPro
  tab_ref:[+ ref, + pro, + ana, - me]
  antecedent:sn13
  interpretation:specific
obj/experiencer:index:sn14
  cat:[animato, umano]
  pred:si
  pers:3
  caso:[acc]
  spec:def:+
  tab_ref:[- ref, - pro, + ana, + me, - subj]
  antecedent:sn18
  interpretation:specific
obl/malef:index:sn17
  cat:[ferocious, animato]
  pred:lupo
  gen:mas
  num:sing
  spec:def:+
  tab_ref:[+ ref, - pro, - ana, + class]
aspect:activity
aspect:state

```

and this is the output of the discourse module,

```

ref_ex(sn13, questi, [+ ref, + def, nil, + pro, - ana, + class], 3, mas, plur, [animato, umano], subj/actor)/23
ref_ex(sn21, casa, [+ ref, - def, nil, - pro, - ana, + class], nil, fem, sing, [object,place], obj /theme_aff)/35
ref_ex(sn17, lupo, [+ ref, + def, nil, - pro, - ana, + class], nil, mas, sing, [animate,ferocious], obl/agent)/40
sn43 = porcellino

```

EXPECTED TOPIC : ref\_ex(, porcellino, \_, nil, mas, plur, [animate,edible], \_/\_)

SECONDARY TOPIC : ref\_ex(, lupo, \_, nil, mas, sing, [animate,ferocious], \_/\_)

POTENTIAL TOPICS : ref\_ex(sn21, casa, [+ ref, - def, nil, - pro, - ana, + class], nil, fem, sing, [object,place], obj /theme\_aff)

state(3, change)

However, in the following sentence, the nominal substitute 'the oldest one' no longer agrees in number with the antecedent, the set of three little pigs, only pointing to a subset made up of a singleton. In order to compute this difference, we simply neutralized the feature Number and let all other features match as before. In addition, since the individual being referred is not strictly speaking equal to the antecedent contained in the Main Topic, we use continue\_analyse.

```

21.[il,maggiore,',',jimmi,',',che,era,saggio,',',lavorava,di,buona,lena,e,costrui_,la,sua,casetta,con,solidi,mattoni,e,c
emento]/ The_sing/mas oldest_sing, jimmi, who was wise_sing/mas, worked of good_sing/fem will and built
his_sing/fem houselet with solid_plur/mas bricks_plur/mas and cement_sing/mas
net(po4)

```

```

main/prop:index:f10
  coord:index:f6
  pred:lavorare
  lex_form:[subj/agent/[umano, animato]]

```

```

mood:ind
tense:imp
cat:attivit 
subj/agent:index:sn1
  cat:[umano, animato]
  pred:maggiore
  pers:3
  gen:mas
  num:sing
  case:[nom]
  spec:def:+
  adjs:nadj/theme:index:sn2
    cat:[animato]
    pred:jimmi
    gen:mas
    num:sing
    spec:def:0
    mods:mod/predic:topic:topic_type:relative
      index:sn3
      cat:[animato]
      pred:pPro
      pers:mas
      gen:sing
      num:3
      case:[nom]
      binder:sn2
      tab_ref:[+ ref, + pro, + ana, - me]
      antecedent:sn2
      interpretation:specific
    index:f4
    pred:essere
    lex_form:[np/subj/theme_bound/[_! _]]
    mood:ind
    tense:imp
    cat:esistenza
    subj/theme_bound:index:sn4
      cat:[animato, umano]
      pred:pro
      pers:3
      gen:mas
      num:sing
      case:[nom]
      binder:sn3
      tab_ref:[+ ref, + pro, - ana, - me]
      antecedent:sn3
      interpretation:specific
    acomp/prop:index:saa2
      cat:[soggettivo]
      pred:saggio
      gen:mas
      num:sing
      subj/prop:index:sn5
        pred:vbl
        binder:sn4
        aspect:state
        tab_ref:[+ ref, - pro, - ana, - class]
      tab_ref:[+ ref, + pro, - ana, + class]
      antecedent:external
      interpretation:specific
    adjs:adj/modal:sem_mark:buona_lena
      obj:nil:index:sn6
        cat:[modo]
        pred:lena
        gen:fem
        num:sing
        spec:def:0
        tab_ref:[+ ref, - pro, - ana, + class]
      aspect:activity
    coord:index:f9
    pred:costruire

```

```

lex_forma:[np/subj/agent/[animato, umano], np/obj/theme_aff/[oggetto, luogo]]
mood:ind
tense:pass_rem
cat:cambiamento
subj/agent:index:sn37
  cat:[animato, umano]
  pred:pro
  pers:3
  gen:mas
  num:sing
  case:[nom]
  spec:def:+
  tab_ref:[+ ref, + pro, - ana, - me]
  antecedent:sn1
  interpretation:specific
obj/theme_aff:index:sn38
  cat:[oggetto, luogo]
  pred:casa
  gen:fem
  num:sing
  spec:def:+
  subj/poss:index:sn69
    cat:[]
    pred:suo
    gen:fem
    num:sing
    spec:def:+
    tab_ref:[+ ref, + pro, - ana, + me]
    antecedent:sn37
    interpretation:specific
  mods:cat:[oggetto|_]
  pred:piccolo
  gen:fem
  num:sing
  tab_ref:[+ ref, - pro, - ana, + class]
adjs:adj/instrumental:sem_mark:con
  subj/nil:sn:index:sn86
    pred:vbl
    binder:sn38
  obj/instrumental:coordin:index:sn82
    cat:[oggetto, strumento]
    coordina:testa:coordinante
    gen:fem
    num:plur
    obj/instrumental:index:sn80
      cat:[oggetto, strumento]
      pred:mattoni
      gen:mas
      num:plur
      spec:def:0
      mods:cat:[oggetto|_]
      pred:solido
      gen:mas
      num:plur
      tab_ref:[+ ref, - pro, - ana, + class]
    obj/instrumental:index:sn81
      cat:[oggetto, strumento]
      pred:cemento
      gen:mas
      num:sing
      spec:def:0
      tab_ref:[+ ref, - pro, - ana, + class]
aspect:accomp

```

and this is the output of the discourse module,

```

ref_ex(sn1, maggiore, [+ ref, + def, nil, + pro, - ana, + class], 3, mas, sing, [animate, human], subj/agent)/30
ref_ex(sn38, casa, [+ ref, + def, nil, - pro, - ana, + class], nil, fem, sing, [object, place], obj /theme_aff)/35
ref_ex(sn2, jimmi, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate, human], nadj/ theme)/90
ref_ex(sn6, lena, [+ ref, 0 def, nil, - pro, - ana, + class], nil, fem, sing, [manner], adj/modale)/1090

```

sn1 = porcellino

MAIN TOPIC : ref\_ex(, porcellino, , 3, mas, sing, [animate,edible], \_/agente)

POTENTIAL TOPICS : ref\_ex(sn38, casa, [+ ref, + def, nil, - pro, - ana, + class], nil, fem, sing, [object,place], obj /aff\_theme)

ref\_ex(sn2, jimmi, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate,human], nadj/theme)

ref\_ex(sn6, lena, [+ ref, 0 def, nil, - pro, - ana, + class], nil, fem, sing, [manner], adj/modal)

state(4, continue\_analyse)

In this case, the nominal substitute 'other ones' has a plural Number but the same set is coreferred, extracting though a different subset from the previous one. We used the same strategy of Neutralization in order to let the Main Topic continue, and the state is CONTINUE\_ANALYSE as before:

22.[gli,altri,',',timmy,e,tommy,',',pigri,e,oziosi,se,la,sbrigarono,in,fretta,',',costruendo,le,loro,casette,con,la,pagli a,e,con,pezzetti,di,legno]/The\_plur/mas others\_plur/mas, Timmy and Tommy, lazy\_plur/mas and idle itself it\_sing/fem dealt in hurry, building the\_plur/fem their\_plur houselets with the straw and with little pieces of wood

net(po5)

index:f3

pred:sbrigarsi

lex\_form:[np/subj/agent/[animato, umano], np/obj\_adv/theme\_nonaff/[\_! \_]]

mood:ind

tense:pass\_rem

cat:risultato

subj/agent:index:sn187

cat:[umano, animato]

pred:altri

pers:3

gen:mas

num:plur

case:[nom, acc]

spec:def:+

mods:index:saa3

cat:[valutativo]

coordina:head:coordinant

gen:mas

num:plur

coord:index:saal

cat:[valutativo]

pred:pigro

gen:mas

num:plur

coord:index:saa2

cat:[valutativo]

pred:ozioso

gen:mas

num:plur

adjs:nadj/tema:index:sn190

cat:[umano, animato]

coordina:head:coordinant

gen:fem

num:plur

nadj/theme:index:sn188

cat:[umano, animato]

pred:timmy

gen:mas

num:sing

spec:def:0

tab\_ref:[+ ref, - pro, - ana, - class]

nadj/theme:indice:sn189

cat:[umano, animato]

pred:tommy

gen:mas

num:sing

spec:def:0

tab\_ref:[+ ref, - pro, - ana, - class]

tab\_ref:[+ ref, + pro, - ana, + class]

antecedent:external

```

    interpretation:specific
obj_avv/theme_nonaff:index:sn263
  cat:[_ _]
  pred:la
  pers:3
  gen:fem
  num:sing
  case:[acc]
  tab_ref:[+ ref, + pro, + ana, + me]
  antecedent:external
  interpretation:specific
adjs:adj/modal:sem_mark:in
  obj:nil:index:sn199
  cat:[modo]
  pred:fretta
  gen:fem
  num:sing
  spec:def:0
  tab_ref:[+ ref, - pro, - ana, + class]
adj:indice:fgerund15
  pred:costruire
  subcat:[np/subj/agent/[animato, umano], np/obj/theme_aff/[oggetto, luogo]]
  modo:ger
  tempo:pres
  cat:cambiamento
  subj/agent:index:sn419
  cat:[animato, umano]
  pred:pPro
  tab_ref:[+ ref, + pro, + ana, - me]
  antecedent:sn187
  interpretation:specific
  obj/theme_aff:index:sn228
  cat:[oggetto, luogo]
  pred:casa
  gen:fem
  num:plur
  spec:def:+
  subj/poss:index:sn347
  cat:[]
  pred:loro
  gen:_85173
  num:_85270
  spec:def:+
  tab_ref:[+ ref, + pro, - ana, + me]
  antecedent:
  interpretation:specific
  mods:cat:[oggetto| _]
  pred:piccolo
  gen:fem
  num:plur
  tab_ref:[+ ref, - pro, - ana, + class]
adjs:adj/strumentale:sem_mark:con
  index:sn356
  cat:[oggetto, strumento]
  pred:paglia
  gen:fem
  num:sing
  spec:def:+
  tab_ref:[+ ref, - pro, - ana, + class]
adj/strumentale:sem_mark:con
  index:sn413
  cat:[oggetto, strumento]
  pred:pezzo
  gen:mas
  num:plur
  spec:def:0
  obj/theme:index:sn418
  cat:[oggetto, strumento]
  pred:legno
  gen:mas

```

```

num:sing
spec:def:0
tab_ref:[+ ref, - pro, - ana, + class]
mods:cat:[oggetto|_]
pred:piccolo
gen:mas
num:plur
tab_ref:[+ ref, - pro, - ana, + class]
aspect:accomp
aspect:achiev_tr
and this is the output of the discourse module,
ref_ex(sn187, altri, [+ ref, + def, nil, + pro, - ana, + class], 3, mas, plur, [animate,human,object|_], subj/agent)/10
ref_ex(sn228, casa, [+ ref, + def, nil, - pro, - ana, + class], nil, fem, plur, [object,place], obj /theme_aff)/35
ref_ex(sn188, timmy, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate,human], nadj/ theme)/1050
ref_ex(sn189, tommy, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate,human], nadj/ theme)/1050
ref_ex(sn199, fretta, [+ ref, 0 def, nil, - pro, - ana, + class], nil, fem, sing, [manner], adj/modal)/1070
sn522 = porcellino
MAIN TOPIC : ref_ex(., porcellino, ., 3, mas, plur, [animate,edible], ./agent)
POTENTIAL TOPICS : ref_ex(sn228, casa, [+ ref, +, nil, - pro, - ana, + class], nil, fem, plur, [object,place],
obj/aff_theme)
ref_ex(sn188, timmy, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate,human], nadj/ theme)
ref_ex(sn189, tommy, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [animate,human], nadj/theme)
ref_ex(sn199, fretta, [+ ref, 0 def, nil, - pro, - ana, + class], nil, fem, sing, [manner], adj/modal)
state(5, continue_analyse)
Another interesting case of Neutralization is constituted by the use of Direct Speech and first and second person
personal forms. This happens suddenly in the text: the algorithm should behave in such a way as to let the Main
Topic and or Secondary Topic to continue, and this is what it does, by neutralizing the feature Person and letting
the remaining features match. These are the three related sentences, and their translation: 15.Frightened out of their
wits, the two little pigs ran at breakneck speed towards their brother's house.16. 'Fast, little brother, open the
door! The wolf is chasing us.' They got in just in time and pulled the bolt.
23.[spaventatissimi,i,due,porcellini,corsero,a,perdifiato,verso,la,casetta,del,fratello]/Frightened_at_their_most_plur
/mas the two piglets ran at breathless (speed) towards the houselet of the brother
net(po15)
index:f9
pred:correre
lex_form:[subj/agent/[umano, animato]]
mood:ind
tense:pass_rem
cat:attivita
subj/agent:index:sn10
cat:[edible, animato]
pred:porcellino
gen:mas
num:plur
spec:def:+
part:+
card:due
tab_ref:[+ ref, - pro, - ana, + class]
adjs:adj/modal:sem_mark:a
obj/nil:index:sn83
cat:[modo]
pred:perdifiato
gen:mas
num:sing
spec:def:0
tab_ref:[+ ref, - pro, - ana, + class]
adj/locative:sem_mark:verso
obj/nil:index:sn138
cat:[oggetto, luogo]
pred:casa
gen:fem

```

```

num:sing
spec:def:+
  subj/poss:index:sn141
    cat:[umano, animato, relazionale]
    pred:fratello
    gen:mas
    num:sing
    spec:def:+
      tab_ref:[+ ref, - pro, - ana, + class]
  mods:cat:[oggettol_54584]
    pred:piccolo
    gen:fem
    num:sing
    tab_ref:[+ ref, - pro, - ana, + class]
adj/emotivo:index:saa16
  cat:[emotivo]
  pred:spaventatissimo
  gen:mas
  num:plur
  sogg/nil:index:sn142
    pred:vbl
    binder:sn10
    tab_ref:[+ ref, - pro, - ana, - me]
aspect:activity

```

and this is the output of the discourse module,

```

ref_ex(sn10, porcellino, [+ ref, +def , +, - pro, - ana, + class], nil, mas, plur, [animate,edible], subj/agent)/10
ref_ex(sn138, casa, [+ ref, +def , nil, - pro, - ana, + class], nil, fem, sing, [object,place], obj/locative)/40
ref_ex(sn141, fratello, [+ ref, +def , nil, - pro, - ana, + class], nil, mas, sing, [human, relational], subj/poss)/41
ref_ex(sn83, perdifiato, [+ ref, 0def , nil, - pro, - ana, + class], nil, mas, sing, [manner], obl/modal)/1050
EXPECTED TOPIC : ref_ex(., porcellino, ., ., mas, plur, ., ./.)
SECONDARY TOPIC : ref_ex(., lupo, ., nil, mas, sing, [animate], ./.)
POTENTIAL TOPICS : ref_ex(sn138, casa, [+ ref, +def , nil, - pro, - ana, + class], nil, fem, sing, [object,place],
obj/locative)
ref_ex(sn141, fratello, [+ ref, +def , nil, - pro, - ana, + class], nil, mas, sing, [human, relational], subj/poss)
ref_ex(sn83, perdifiato, [+ ref, 0def , nil, - pro, - ana, + class], nil, mas, sing, [manner], obl/modal)
state(15, change)

```

24.[',presto,',',fratellino,',',aprici,!,abbiamo,il,lupo,alle,calcagna,']/Quick, brother + little, open\_imper/ 2nd\_pers+  
us\_plur! (We) pro have\_present\_plur/1st\_pers the wolf at our heels.

net(po16)

index:f1

dir\_speech/prop:index:f4

```

pred:avere
  lex_form:[np/subj/experiencer/[umano, animato], np/obj/theme_bound/[_! _], pcomp/locative/[luogo]]
mood:ind
tense:pres
cat:stato
  subj/experiencer:index:sn4
    cat:[umano, animato]
    pred:pro
    pers:1
    gen:mas
    num:plur
    case:[nom]
    spec:def:+
      tab_ref:[+ ref, + pro, - ana, - me]
      antecedent:external
      interpretation:specific
  obj/theme_bound:index:sn5
    cat:[ferocious, animato]
    pred:lupo
    gen:mas
    num:sing
    spec:def:+

```

```

    tab_ref:[+ ref, - pro, - ana, + class]
pcomp/locative:sem_mark:a
  subj:nil:index:sn17
    pred:vbl
    binder:sn5
  obj:nil:index:sn16
    cat:[body_part, luogo, oggetto]
    pred:calcagna
    gen:fem
    num:plur
    spec:def:+
    tab_ref:[+ ref, - pro, - ana, + class]
  mods:mod:[]
  aspect:state
adj:sem_mark:dir_speech
  sub/prop:index:f2
  pred:aprire
  lex_form:[np/subj/agente/[umano, animato], pp/obj2/experiencer/a/[umano, animato]]
  mood:imper
  tense:pres
  cat:risultato
  subj/agent:index:sn1
    cat:[umano, animato]
    pred:pro
    pers:2
    gen:mas
    num:sing
    case:[nom]
    spec:def:+
    tab_ref:[+ ref, + pro, - ana, - me]
    antecedent:sn2
    interpretation:specific
  obj2/experiencer:index:sn3
    cat:cat:[umano, animato]
    pred:ci
    pers:1
    gen:_75719
    num:plur
    case:[dat]
    spec:def:+
    tab_ref:[+ ref, + pro, + ana, + me]
    antecedent:sn4
    interpretation:specific
  adjs:nadj/theme:index:sn2
    cat:[umano, animato, relazionale]
    pred:fratello
    gen:mas
    num:sing
    spec:def:0
    mods:cat:[umano|_]
    pred:piccolo
    gen:mas
    num:sing
    tab_ref:[+ ref, - pro, - ana, + class]
  adj/modal:pred:presto
  aspect:achiev_tr

```

and this is the output of the discourse module,

```

ref_ex(sn4, pro, [+ ref, +, nil, + pro, - ana, - me], 1, mas, plur, [human, animate], subj/experiencer)/20
ref_ex(sn5, lupo, [+ ref, +, nil, - pro, - ana, + class], nil, mas, sing, [animate,ferocious], obj/theme_nonaff)/25
ref_ex(sn16, calcagna, [+ ref, +, nil, - pro, - ana, + class], nil, fem, plur, [object,place], pcomp/locative)/38
ref_ex(sn2, fratello, [+ ref, 0, nil, - pro, - ana, + class], nil, mas, sing, [human, animate, relational], nadj/theme)/80
sn4 = porcellino
MAIN TOPIC : ref_ex(_, porcellino, _, _, mas, plur, [human, animate], subj/experiencer)
SECONDARY TOPIC : ref_ex(_, lupo, _, nil, mas, sing, [animate,ferocious], obj/theme_nonaff)
POTENTIAL TOPICS : ref_ex(sn16, calcagna, [+ ref, +, nil, - pro, - ana, + class], nil, fem, plur, [object,place],
pcomp/locative)

```

ref\_ex(sn2, fratello, [+ ref, 0, nil, - pro, - ana, + class], nil, mas, sing, [human, animate, relational], nadj/tema)  
state(16, continue)

As can be noticed, personal forms should be made visible to the sentence binding module so that the clitic 'ci/us' could be adequately bound by the little pro 1st person pronoun of the following sentence before reaching the discourse module. Also, the bound subject of the imperative should be bound to the vocative 'fratellino' at sentence level. In the following sentence, 3rd person plural verbal agreement is used to continue the story.

25.[fecero, appena, in, tempo, ad, entrare, e, a, tirare, il, chiavistello]/(They) pro made\_past/plur/3rd\_pers just in time to enter and to pull the bolt

```
net(po17)
index:f3
pred:fare
lex_form:[np/subj/agent/[umano, animato], pp/obl/temporal/in/{tempo}]
mood:ind
tense:pass_rem
cat:risultato
subj/agent:index:sn1
  cat:[umano, animato]
  pred:pro
  pers:3
  gen:mas
  num:plur
  case:[nom]
  spec:def:+
  tab_ref:[+ ref, + pro, - ana, - me]
  antecedent:external
  interpretation:specific
obl/temporal:index:sn30
  cat:[tempo]
  pred:tempo
  gen:mas
  num:sing
  spec:def:0
  vcomp/prop:index:finf23
  coord:index:finf24
  pred:tirare
  lex_form:[subj/agent/[umano, animato],obj/theme_aff/[oggetto, strumento]]
  mood:inf
  tense:pres
  cat:risultato
  subj/agent:index:sn34
    cat:[umano, animato]
    pred:pPro
    tab_ref:[+ ref, + pro, + ana, - me]
    antecedent:sn1
    interpretation:specific
  obj/theme_aff:index:sn32
    cat:[oggetto, strumento]
    pred:chiavistello
    gen:mas
    num:sing
    spec:def:+
    tab_ref:[+ ref, - pro, - ana, + class]
  aspect:achiev_tr
  tab_ref:[+ ref, - pro, - ana, + class]
adjs:avv:pred_avv:appena
  type:temp
  duraz:punt
  config:[tr<td]
aspect:achiev_tr
```

and this is the output of the discourse module,

ref\_ex(sn1, pro, [+ ref, +, nil, + pro, - ana, - me], 3, mas, plur, [human, animate], subj/agent)/10

ref\_ex(sn32, chiavistello, [+ ref, +, nil, - pro, - ana, + class], nil, mas, sing, [object,instrument], obj/theme\_aff)/1035

ref\_ex(sn30, tempo, [+ ref, 0, nil, - pro, - ana, + class], nil, mas, sing, [time], adj/temporal)/1070

sn5 = porcellino

MAIN TOPIC : ref\_ex(, porcellino, , , mas, plur, [human, animate], subj/agent)

POTENTIAL TOPICS : ref\_ex(, lupo, , nil, mas, sing, [animate,ferocious], obj/theme\_bound)

ref\_ex(sn32, chiavistello, [+ ref, +, nil, - pro, - ana, + class], nil, mas, sing, [object,instrument], obj/aff\_theme)

ref\_ex(sn30, tempo, [+ ref, 0, nil, - pro, - ana, + class], nil, mas, sing, [time], adj/temporal)

state(17, continue)

#### **4. NOMINAL EXPRESSIONS**

##### **4.1 Rejecting the Expected Topic and Activating Inferencing Mechanisms**

As we said previously, we let the algorithm activate inferential mechanisms only when a state of CHANGE is detected in the previous sentence or whenever a nominal expression is used to cospecify a Main Topic while CHANGE is detected. No such triggering takes place for SHIFTING from a given Main Topic into a New Main Topic; nor for RETAINING, i.e. whenever a new topic is introduced as an indefinite expression or a proper noun. In a state of CONTINUE inferencing may be activated as long as the grammatical representation allows it: in other words, the nominal expression must be computed as an indirectly governed function by the parser: these are SUBJ or OBJ functions which are not directly governed by the main predicate of a sentence, but by a predicate function, such as the ACOMP contained in the lexical forms of verbs such as 'BELIEVE<SUBJ,ACOMP>OBJ', or 'BE<ACOMP>SUBJ'. We compute the difference in government by associating a special semantic role, THEME\_BOUND to the function.

The result of scoring is used to set up adequate conditions for triggering inferential processes both in presence of a pronominals and a nominal expressions. However, the behaviour of pronominals is only determined after grammatical constraints are satisfied at sentence level. As to what triggers an inference to be drawn Ehrlich(1981) states clearly the point: at first a relation between expressions must somehow be perceived before an inference is drawn, and this relation is clearly syntactic and semantic in nature. As she comments 'people do not draw inferences randomly to relate linguistic expressions', showing how in two examples people related 'bus' and 'vehicle' only when certain conditions would require it; the examples she uses are the following:

26i. A bus came roaring round the corner.

ii. The vehicle nearly flattened a pedestrian.

27i. A bus came roaring round the corner.

ii. It nearly smashed one vehicle.

In the first example an entity 'bus' is introduced in the discourse as the Topic and then reinforced in the following sentence using a class noun 'vehicle' which subsumes the reference of 'bus'. Criteria for relating the two referring expressions are the use of SUBJ function in the second sentence, together with definiteness, and inferencing. In example 17, once the pronoun 'it' is processed as anaphoric to the Expected Topic, it must be obviative with any other referring expression contained within the same f-structure, the sentence. In our system triggering material may derive both from sentence level analysis and from discourse level one. In case the Expected Topic is rejected as possible coreferent of the pronoun and another phrase is chosen, the rejected phrase is retained for possible re-introduction later in discourse. Rejection is possible when compatibility requirements and/or agreement tests are not met. In our system, whenever a common noun is used as SUBJECT of a sentence instead of a pronoun and it is different from the Main Topic it triggers rules for FILTERING and inference checking. In particular a subject which is a Bound\_Theme, as the subject of a copulative sentence, cannot be computed as an Expected Topic and is filtered. Inferencing is limited to a table lookup procedure for the encycloaedic information associated to a certain lexical entry, in other words an IS\_A relation.

Another case in which the algorithm calls for inference check is the presence of more than one candidate satisfying semantic and syntactic requirements to be picked up as antecedent of a pronoun. Our approach is based on the premises that once a possible Main Topic is chosen as antecedent of a pronoun, in case some incompatibility or some ambiguity exist, inferring processes are called for to confirm or reject an Expected Topic.

We shall now discuss a text we have analysed, which, differently from the examples found in the literature is taken directly from a newspaper. It deals with politics and there are three main topics: Avveduti who has been appointed secretary general by his father-in-law who is a senator and Trabucchi, a minister of trade. In the first text, we have an introductory sentence and a continuation in which a pronoun and a definite NP is used to corefer

to the previous Topics. Inferences must be drawn in order to establish both the antecedent for the pronoun and for the definite NP. However, in the case of the pronoun, in order to be able to trigger the inferential device, a nominal head must be made available and this is done via the grammatical representation. In particular, a predicate like APPOINT has an NP OBJECT which has Bound\_Theme as semantic role, to indicate that the OBJ is non thematic or indirectly governed, as shown by the complete lexical entry, 'APPOINT, trans,achievement,soc\_institution,[SUBJ/Ag, OBJ/Th\_bound, NCOMP/Prop]'. The open function is an open proposition which however makes available a nominal head to the OBJECT pronoun, and this nominal head in turn is used to trigger the inference. In the third sentence the continuation is computed only by means of pronominal expressions which are graded independently according to scoring and the adequate antecedents are thus picked up automatically.

TEXT N. 1

28.[a,avveduti,piaceva,parlare,del,suocero] / To Avveduti liked\_past/sing/3rd\_pers talking about the father-in-law.

ref\_ex(sn8, avveduti, [+ ref, 0def, nil, - pro, - ana, - class], nil, mas, sing, [human], obj2/experiencer)/10

ref\_ex(sn9, suocero, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [human, relational], obl/disc\_subj)/31

EXPECTED TOPIC : ref\_ex(sn8, avveduti, [+ ref, 0 def, nil, - pro, - ana, - class], nil, mas, sing, [human], obj2/experiencer)

POTENTIAL TOPICS : ref\_ex(sn9, suocero, [+ ref, + def, nil, - pro, - ana, + class], nil, mas, sing, [human, relational], obl/disc\_subj)

state(1, change)

29.[il,senatore,lo,aveva,nominato,segretario,particolare]/The senator had appointed him secretary general

ref\_ex(sn17, senatore, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_high], subj/agent)/10

ref\_ex(sn19, lo, [+ ref, +def, nil, + pro, + ana, + me], 3, mas, sing, [human], obj/theme\_bound)/15

ref\_ex(sn20, segretario, [+ ref, 0def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_low], ncomp/prop)/50

is\_a(avveduti, segretario)/is\_a(suocero, senatore); sn17 = suocero; sn19 = avveduti

MAIN TOPIC : ref\_ex(, suocero, , nil, mas, sing, [human, soc\_high], subj/agent)

SECONDARY TOPIC : ref\_ex(, avveduti, , 3, mas, sing, [human], obj/theme\_bound)

state(2, continue)

30.[era,un,uomo,che,chiunque,avrebbe,sfruttato,ma,che,lui,preferiva,lasciare,perdere]/(He) pro was\_past/sing/3rd\_pers a man that anyone had\_past/sing/3rd\_pers exploited but that him(self) preferred to let go.

ref\_ex(sn5, pro, [+ ref, +def, nil, + pro, - ana, - me], 3, mas, sing, [ ], subj/theme\_bound)/40

ref\_ex(sn13, lui, [+ ref, +def, nil, + pro, - ana, + me], 3, nil, sing, [human], subj/actor)/43

ref\_ex(sn10, pPro, [+ ref, nil, nil, - pro, - ana, - me], nil, , , [event, state, human], obj/theme\_aff)/45

ref\_ex(sn6, uomo, [+ ref, -def, nil, - pro, - ana, + class], nil, mas, sing, [human], ncomp/prop)/50

sn5 = suocero; sn13 = avveduti

MAIN TOPIC : ref\_ex(, suocero, , nil, mas, sing, [human, soc\_high], subj/agent)

SECONDARY TOPIC : ref\_ex(, avveduti, , 3, mas, sing, [human], obj/theme\_bound)

POTENTIAL TOPICS : ref\_ex(sn10, pPro, [+ ref, nil, nil, - pro, - ana, - me], nil, , , [event, state, human], obj/tema\_aff); ref\_ex(sn6, uomo, [+ ref, -def, nil, - pro, - ana, + class], nil, mas, sing, [human], ncomp/prop)

state(3, continue)

In the following we show how, by varying the second sentence of the text, different inferences are triggered. Texts are limited to the second sentence which determine strictly what should happen in the third sentence. In text 2, we see how the appearance of an indefinite NP causes the algorithm to establish a new expected topic and RETAINing is the new state rather than CONTinue. In particular, then only one inference is triggered always by means of the grammatical representation. In text 3 a proper noun is used as SUBJECT and is turned into a Main Topic: inferences are required for the pronoun.

TEXT 2:

31.[un, senatore, lo, aveva, nominato, segretario, particolare]/ A senator him had\_past/sing/3rd\_pers appointed secretary general

ref\_ex(sn17, senatore, [+ ref, -def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_high], subj/agent)/10  
 ref\_ex(sn19, lo, [+ ref, +def, nil, + pro, + ana, + me], 3, mas, sing, [human], obj/theme\_bound)/15  
 ref\_ex(sn20, segretario, [+ ref, 0def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_low], ncomp/prop)/50  
 is\_a(avveduti, segretario); sn19 = avveduti  
 EXPECTED TOPIC : ref\_ex(, senatore, , nil, mas, sing, [human, soc\_high], subj/agent)  
 SECONDARY TOPIC : ref\_ex(, avveduti, , 3, mas, sing, [human], obj/theme\_bound)  
 state(2, retaining)

TEXT 3.

32.[trabucchi, lo, aveva, nominato, segretario, particolare]/ Trabucchi him had\_past/sing/3rd\_pers appointed secretary general

ref\_ex(sn43, trabucchi, [+ ref, 0def, nil, - pro, - ana, - class], nil, mas, sing, [human], subj/agent)/10  
 ref\_ex(sn45, lo, [+ ref, +def, nil, + pro, + ana, + me], 3, mas, sing, [human], obj/theme\_bound)/15  
 ref\_ex(sn46, segretario, [+ ref, 0def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_low], ncomp/prop)/50  
 is\_a(avveduti, segretario); sn45 = avveduti  
 MAIN TOPIC : ref\_ex(, trabucchi, , nil, mas, sing, [human], \_/agent)  
 SECONDARY TOPIC : ref\_ex(, avveduti, [+ ref, 0def, nil, - pro, - ana, - class], nil, mas, sing, [human], \_/\_)  
 state(2, continue)

The following texts are in a condition of complete ambiguity but the inferential mechanism may still work as long as the grammatical representation allows it to recover the nominal head which is an open complement where the object pronoun is interpreted.

TEXT 4.

33.[lo, aveva, nominato, segretario, particolare] / (he) pro him had\_past/sing/3rd\_pers appointed secretary general

ref\_ex(sn37, pro, [+ ref, +def, nil, + pro, - ana, - me], 3, \_11419, sing, [human], subj/agent)/10  
 ref\_ex(sn39, lo, [+ ref, +def, nil, + pro, + ana, + me], 3, mas, sing, [human], obj/theme\_bound)/15  
 ref\_ex(sn40, segretario, [+ ref, 0def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_low], ncomp/prop)/50  
 is\_a(avveduti, segretario); sn37 = suocero / sn39 = avveduti  
 MAIN TOPIC : ref\_ex(, suocero, , 3, mas, sing, [human], subj/agent)  
 SECONDARY TOPIC : ref\_ex(, avveduti, , 3, mas, sing, [human], obj/theme\_bound)  
 state(2, continue)

TEXT 5.

34.[nel, 1950, lo, avevano, nominato, senatore]/In 1950 (they) pro him had\_past/plur/3rd\_pers appointed senator

ref\_ex(sn43, pro, [+ ref, +def, nil, + pro, - ana, - me], 3, mas, plur, [human], subj/agent)/10  
 ref\_ex(sn45, lo, [+ ref, +def, nil, + pro, + ana, + me], 3, mas, sing, [human], obj/theme\_bound)/15  
 ref\_ex(sn46, senatore, [+ ref, 0def, nil, - pro, - ana, + class], nil, mas, sing, [human, soc\_high], ncomp/prop)/50  
 ref\_ex(sn40, 1950, [+ ref, +def, nil, - pro, - ana, - class], nil, mas, sing, [time], adj/temporale)/1050  
 is\_a(avveduti, senatore) failed; is\_a(suocero, senatore) / sn43 = indefinite / sn45 = suocero  
 MAIN TOPIC : ref\_ex(, suocero, , 3, mas, sing, [umano], \_/theme\_bound)  
 SECONDARY TOPIC : ref\_ex(, avveduti, [+ ref, 0def, nil, - pro, - ana, - class], nil, mas, sing, , \_/\_)  
 POTENTIAL TOPICS : ref\_ex(sn40, 1950, [+ ref, +def, nil, - pro, - ana, - class], nil, mas, sing, [time], adj/temporal)  
 state(2, continue)

## 5. *Quantifiers*

It is a well known fact that quantifiers and quantified NPs do not refer in the text or discourse, in the sense that they are unable to pick up a specific individual as antecedent to which they may corefer. However, when computing reference quantifiers either lexically expressed or unexpressed may be used by speakers to continue the

topic of discourse. In our referential system, ROSIE(see Delmonte & Bianchi 1991a, 1991b), both unexpressed and expressed quantified expressions are computed in the same way: unexpressed quantifiers, like big PROs or little pros in sentences with arbitrary or generic interpretation lack in some or all  $\Phi$ -features (number,gender,person).

### 5.1 Quantifiers and quantified NPs as antecedents

In her works, Webber(1977, 1983) extensively deals with the problem of the interpretation of quantified expressions. Quantifier scope requires a separate level of representation, logical form, which builds on grammatical representation. In other words, it would seem that once f-structures have been built, this level of representation must be turned into two separate levels: one required for anaphoric binding sentence internally, the other relevant to quantifier scoping(see Delmonte, 1989). However, at discourse level and from a procedural point of view, problems may arise only when a singular indefinite quantified expressions is referred to by a plural pronoun in a following sentence. In other words, whenever a plural pronoun looks for antecedents and the previous sentence contains quantified expressions, the availability of the logical form for the sentence is crucial. In our paper(Bianchi, Delmonte, 1989a) we discuss a modified version of Hobbs and Shieber's algorithm for scope assignment to quantified expressions. In order to decide whether a singular indefinite expression can be treated as a plural one scope must be computed: in particular, its scope must be included in that of a universal quantifier with a distributive reading. We shall quote one of her examples(1983,363-d25):

35.1 Last week Wendy bought each boy a green T-shirt at Macy's.

2 She prefers them in more subdued colors, but these were on sale.

This is a typical example which requires at first scope assignment to be computed for the two quantified NP's, "each boy" and a "green shirt". As Webber remarks, a definite plural anaphor may also specify a generic set entity and this is possible even with a singular definite noun phrase as antecedent. The only condition seems to be procedural and based on "recency": quoting from Webber, ".. the listener can generate new generic-set entities whose IDs are based on generalizations of a recent description the listener has either heard or derived." the only restriction being constituted by the fact that these generalizations must somehow be shared by the speaker. We might add that such a generalization is reached through the interpretation process: a generic reference to a definite description is interpreted as such if it is not referential. In other words, there are strong restrictions to interpret an assertion as a generic statement, and they mainly concern the interpretation of tense and its modifiers. In order to compute the reference of a definite NP as generic, tense cannot be definite and referential, and adverbial modifiers cannot be deictic. This is clear if we look at some of Webber's examples(hers d22 through d28), as for instance(the underlining is mine):

36.1 Last week Wendy again bought each boy a green T-shirt at Macy's.

2 She's always buying them.

37.1 I see seven Japanese cars in the parking lot.

2 They're really selling like hot cakes.

38.1 Last week Wendy bought each boy a green T-shirt at Macy's.

2 She gives them to everyone.

39.1 Wendy bought some T-shirt yesterday.

2 Usually she charges them, but yesterday she paid cash.

40.1 Wendy wouldn't buy a green T-shirt, because they always run in the wash.

All the items underlined are either the main verb or the adverbial modifier: tense is simple present, or progressive, and adverbials are "always, usually, really". The intended meaning conveyed by the sentences in 2. is iteration on events, the events are those of buying, selling, charging, giving. In other words it is quantification on events introduced by tense and adverbial modifiers which acts on propositions, just like quantifiers and determiners act on NPs(see Hinrichs, 1988; Bianchi & Delmonte, 1989a).

Expressed quantifiers and quantified expressions also require Neutralization of one feature: Number. Here below we show how the system computes a big Pro and indefinite by allowing the topic of discourse to continue. In particular, in case an indefinite is in the scope of a universal quantifier or a quantifier like "each" which must assume scope in order for the sentence to be grammatical, in lack of other sources of knowledge - which however in a given context might be available - the system rejects the quantified expression and takes the indefinite as

antecedent because it has the Number feature set to nil. In order to produce this result, LFG grammatical representations must be passed on the algorithm for scope assignment, which builds up a Logical Form, as explained below. The system calls up Logical Form automatically each time it spots an indefinite expressions in the list of possible arguments of discourse. The LF algorithm assigns scope to the quantified expressions contained in the sentence under analysis and decides whether the indefinite is in the scope of a universal quantifier. In that case it proceeds to modify the feature Number. Then it continues computing topics of discourse as usual.

41.[ogni,porcellino,ha,visto,un,lupo,nella,campagna]/Every little pig saw a wolf in the countryside  
definito(sn25,campagna(sn25),

```
state(f7,
  and(situation(f7),
    []),
    ogni(sn12,porcellino(sn12),
      indefinito(sn13,and(lupo(sn13),
        in(sn13, sn13, sn25)),
        vedere(sn12, sn13, f7))))))
```

ref\_ex(sn12, porcellino, [+ ref, 0def, - part, nil, - pro, - ana, + class], nil, mas, sing, [edible, animato],  
sogg/esperiente)/11

ref\_ex(sn13, lupo, [+ ref, - def, nil, nil, - pro, - ana, + class], nil, mas, nil, [ferocious, animato], ogg/tema\_nonaff)/15

ref\_ex(sn25, campagna, [+ ref, + def, nil, nil, - pro, - ana, + class], nil, fem, sing, [luogo], ogg/nil)/1022

EXPECTED TOPIC : ref\_ex(sn12, porcellino, [+ ref, 0def, - part, nil, - pro, - ana, + class], nil, mas, sing, [edible,  
animato], sogg/esperiente)

POTENTIAL TOPICS : ref\_ex(sn13, lupo, [+ ref, - def, nil, nil, - pro, - ana, + class], nil, mas, nil, [ferocious, animato],  
ogg/tema\_nonaff)

ref\_ex(sn25, campagna, [+ ref, + def, nil, nil, - pro, - ana, + class], nil, fem, sing, [luogo], ogg/nil)

state(1, changing)

[erano,tutti,cattivi]/they were all bad

ref\_ex(sn4, tutti, [+ ref, nil, nil, nil, - pro, - ana, - me], nil, mas, plur, [umano, animato], sogg/prop)/50

MAIN TOPIC : ref\_ex(, tutti, , nil, mas, plur, [umano, animato], \_/prop)

SECONDARY TOPIC : ref\_ex(, porcellino, [+ ref, 0def, - part, nil, - pro, - ana, + class], nil, mas, sing, , \_/\_)

state(2, resume)

## 5.2 Pronominals

Coming now to pronouns, they may be free, controlled or bound. A pronominal is bound only when its antecedent is a quantifier, a quantified NP or in case no controller is available at sentence level, a number of semantic conditions are met at the level of tense and mood specification and arbitrary reading is assigned to the whole sentence. In this latter case, the pronominal expression must either be an empty pronoun, big PRO or the nominative clitic *si* /one. Sentences with arbitrary or generic reading can in turn be assigned either universal quantification or existential quantification: only in the former case, when introduced in discourse, they may be iterated without producing incoherence. The matter is discussed at length in Cinque(1988) who comes to the conclusions that the difference in meaning is due simply to the particular tense and aspect of the sentence.

42a. Oggi a Beirut si è ucciso un innocente / Today in Beirut one killed an innocent

b. Oggi a Beirut si è sparato tutta la mattina / Today in Beirut one shot the whole morning

c. %Oggi a Beirut si è nati senza assistenza medica / Today in Beirut we were born with no medical assistance

Example c. is bad because of tense specification and of the nature of the syntactic class of the main verb, an Ergative, as contrasted by the two previous cases where we have a transitive and an unergative verb. The sentence becomes good if we change tense, by introducing present indicative which assigns to the sentence a non specific time reference,

d. Oggi a Beirut si nasce senza assistenza medica

As a matter of fact, present tense may be assigned both a generic interpretation and a specific interpretation in case the spatio-temporal location coincides with discourse time. In this case, the discourse might continue by introducing a single individual satisfying the description denoted by the sentence:

e. John's child, for example.

Cinque quotes examples from Carlson's approach to bare plurals in English, where the a. example receives a quasi-universal reading whereas the b. example receives a quasi-existential reading,

43a. Dogs run around in circles.

b. Dogs are running around in circles.

Italian has a 3rd pers.plural construction which enters an arbitrary reading, as long as the pronoun is the empty little *pro*, as shown by his 47:545,

44a. *Lì, odiano gli stranieri* / There they hate foreigners

b. *Qui lavorano anche di sabato* / Here they work even on Saturday

As with other generic readings, also in this case the indetermined subject cannot be bound to a specific individual in discourse, and this is a function of tense interpretation. The interpretation of little *pro* however becomes specific in case the spatial adverbial is omitted, as in "Odiano gli stranieri" or "Lavorano anche di sabato". Arbitrary interpretation may also appear with 2nd person singular pronouns. Also *pro*-object discussed by Rizzi(1986) in detail follows the same pattern, receiving only a generic universal reading.

However, it is clear from the examples quoted by Cinque, that little *pro* 3rd pers.plural may only be assigned generic reading when an adverbial specifying a spatial location is present, and tense is present indicative. As for impersonal "si" and middle constructions we have the same effect always due to tense and aspect specification.

### 5.3 Arbitrary or Generic Reading

In our system, all [+ana] marked pronouns do not possess intrinsic reference, being also marked [-ref] and two consequences ensue: they must be bound in their sentence and cannot look for antecedents in the discourse, unless there are additional conditions intervening, i.e. tense must be specific and not generic, mood must be real. Else, they can be assigned ARBITRARY interpretation, when a controller is lacking, and a series of semantic conditions are met as to tense and mood specification. Since ARBITRARY interpretation is a generic quantification on events this can be produced with untensed propositions or tensed ones, but with no deictic or definite import as shown by:

45a. I think that [<sub>prop</sub>[+arbitrary]killing oneself is foolish]

b. I think that [<sub>prop</sub>[+definite]killing oneself has been foolish]

A further argument may be raised for Arbitrary PROs which in LFG are introduced each time the clause does not contain a controller because being a closed function it does not need one: we quote here Bresnan(1982,345) example, in Italian,

46. *E' difficile andarsene*./It is difficult to leave

where the infinitive "to leave" may be analysed as an extraposed COMP bound to the SUBJect. The PRO generated as SUBJect of the predicate "LEAVE" receives [arbitrary] interpretation. In general, reflexive pronouns lacking the ability to refer independently receive their reference from their binders: in case no binder is available reflexive pronouns are assigned arbitrary or generic reference. This may be detected both from structural cues and from properties associated with the predicate of the matrix clause. In 46. the copulative sentence is a typical case in question: the adjective "difficult" may or may not select a binder for the infinitive which should appear with the preposition "for", thus turning the PRO from arbitrary to controlled,

46i. *E' difficile per Gino andarsene*/It is difficult for John to leave.

A similar case may be raised for anaphoric possessive pronouns, whenever they are contained in a subject NP. Possessives pronouns are obviative according to whether or not they are contained in a predicative or open function, as shown by the following examples,

47. *La propria<sub>arb</sub> libertà è una cosa importante*/One's freedom is an important thing

The sentence contains a generic statement absolutely parallel to the reading of 46; the same happens whenever the anaphoric pronoun is contained in the subject position of a closed function like a sentential complement,

48. *Marta<sub>i</sub> pensa che la propria<sub>i/arb</sub> libertà sia una cosa importante*/ Martha thinks that one's freedom be an important thing in a parallel way to the behaviour of PRO

48i. Mary thinks that [ PRO to behave oneself is important.

We may note at this point the fact that English possessive pronouns behave in a different way from Italian ones: in particular "his" may be bound by a quantifier through PRO, and it may be taken to corefer to a non c-commanding NP, differently from what happens in Italian,

49. \*La sua<sub>i</sub> salute preoccupa ognuno<sub>i</sub>

50. PRO Knowing his<sub>i</sub> father pleases every boy<sub>i</sub> ≠ Conoscere proprio<sub>i</sub>/suo<sub>x</sub> padre fa piacere a ogni<sub>i</sub> ragazzo

51. His<sub>i</sub> mother loves John<sub>i</sub> ≠ Sua<sub>x</sub> madre ama Gino<sub>i</sub>

In particular, "his" seems to possess the ability to be bound by quantifiers like "proprio" does: in 50. the Italian version becomes analogous to the English one if we substitute "proprio" to "suo". In other words, Italian has two separate lexical pronouns for bound and unbound reference whereas English has only one and the conditions on binding are simply structural whereas in Italian they are both structural and lexical. The peculiarity of long-distance anaphors emerges from the dependency of binding on the presence of a feature at sentence level, the one related to the mood of the subordinate clause. In particular, as also detected in other languages (cf. Zaenen, 1983) the choice of Indicative vs. Subjunctive Mood is relevant for the binding possibilities of anaphors contained in the clause. The presence of the Indicative, in the most embedded clause, the one containing the long-distance anaphor seems to block binding from the matrix clause, as shown in:

52. Gino<sub>i</sub> pensa che tu *sia* convinto che la propria<sub>i</sub>/\*arb famiglia *sia* la cosa più importante.

53. Gino<sub>i</sub> pensa che tu *sei* convinto che la propria\*<sub>i</sub>/arb famiglia *è* la cosa più importante.

John thinks that you be/are convinced that self's family be/is the most important thing.

where we changed subjunctive in 52. to indicative in 53.: only 52. allows binding, hence bound reference, and disallows arbitrary reference; on the contrary 53. only allows arbitrary reference i.e. no reference at all. As discussed at length in Zaenen(1983) the choice of the mood is bound by the matrix verb which permits only certain kind of referential acts to be realized by the complement clause. Being lexical, this information can be easily transmitted in features to the c-structure and percolated according to the usual LFG conventions (see Giorgi, 1984, for a lexical typology of the governing verbs).

The same applies to derived nominals like "suspicion" which can be the head of a sentential complement, inducing long-distance binding or preventing according to the presence of [+BOUND] feature,

54. Gino<sub>i</sub> ritiene che il sospetto di Carlo<sub>j</sub> che la propria<sub>i</sub>/<sub>j</sub> sorella sia un assassino abbia determinato la sua condanna.

55. Gino<sub>i</sub> ritiene che l'affermazione di Carlo<sub>j</sub> che la propria\*<sub>i</sub>/<sub>j</sub> sorella è un assassino abbia determinato la sua condanna.

/ John believes that the Karl's suspicion that self's sister be/is a murdered had determined his/her trial.

The relations intervening between tense, mood and pronominal expressions which possess the feature [+ana] are computed by a special module for interpretation, within the binding algorithm, at sentence level. The output of the module is made visible by the attribute "interpretation".

#### 5.4 Quantifiers and quantified NP's as antecedents

As a first approach to the problem of quantifiers, the algorithm takes care of precedence whenever a quantified NP is indicated as possible antecedent for a pronoun. Quantified antecedents are individuated by the presence of the feature  $\pm$ part in SPEC, as follows,

56. quantified(Ante) :- node(N):index:Ante,  
node(N):spec:part:\_.

This predicate is used for quantified antecedents in a simple declarative with psychic verbs: thus, binding of a possessive long distance anaphor can take place from a quantified antecedent contained at clause level.

However, when we want to deal with quantifiers and quantified NPs as possible antecedents of little pros, clitics or independent pronouns a different procedure must be called in, and is the following one,

57. a. non\_quantif(Ante) :- node(N):index:Ante,  
not node(N):spec:part:\_, !.

b. non\_quantif(Ante) :- node(N):index:Ante,  
node(N):spec:part:X,

(X = '.'),  
 node(N):spec: def: '+'.

This procedure is integrated into the predicate for referring clitics, in particular as follows,

58. refer(Net,Ind,[+ref,+pro,+ana,+me],Ante/N):-

```

node(node):index:Ind,
node(node):cat:features,
node(node):num:number,
node(node):gen:gender,
find_gender(node,Gen),
f_command(NAnte,F_ante,Ind,N),N > 0,
f_structure(NAnte,F_ante,N_ante),
not contains(NAnte,Ind),
node(N_ante):F_sup:node(N2),
node(N2):F/R:index:Ante,
  non_quantif(Ante),
not node(N2):path(_):Ind,
node(N2):F/R:cat:Cat,
features(Cat,features),
node(N2):F/R:gen:Gen_ante,
node(N2):F/R:num:Num_Ante,
number = Num_Ante,
node(N2):F/R:ref_tab:List,
poss_ante(Ind,Ante,List),
non_referred_in(Ind,Ante).
```

In this way we can account for lack of coreference between a clitic pronoun contained in a fronted subordinate clause and a quantified NP contained in the main clause, as in the a. example

59a. When I insulted him, every student went out of the room.

b. When I insulted *him*, *John* went out of the room.

as opposed to the b. example, where coreference is allowed as usual. This notion of binding which is relevant for long-distance anaphors is also important for quantifiers as discussed in another work (Delmonte, 1989), in particular the fact that pronouns embedded in an Indicative or [-BOUND] clause need referential antecedents and not arbitrary or generic ones, as shown by the pair

60a. A woman requires/demands that many/every men be in love with her, \*and John knows her.

b. A woman believes that many men like her, and John knows her.

in 60a., both in English and Italian, the indefinite "a woman" is computed as generic in the main clause and the same happens to the pronoun "her" in the complement clause introduced by "that"; but the conjoined sentence is expressed in the indicative and requires a specific woman to be picked up for referring the pronoun "her", which in this case must be computed as referential and not as generic, so the sentence is ungrammatical. The opposite happens in 60b., where the indefinite is taken to refer to a specific woman in the discourse, and the two occurrence of "her" to be bound to this individual. As clearly shown, the referential capabilities of pronouns are tightly linked to the ones of their antecedent: but the opposite may happen, i.e. the referential abilities of the antecedents are bound by those of the pronouns, and these in turn are conditioned by the referential nature of the RD- referential domain - in which they are contained: an [-BOUND] domain is one containing indicative mood and reference is free, whereas a [+BOUND] domain is one containing subjunctive mood and reference not free but locally bound, for anaphors, or lacking in referential import for lexical pronouns. However, in order to produce an adequate result, the discourse module must also query tense and aspect interpretation module which alone may assess whether a generic or an existential reading is made available by the sentence under analysis. The two following examples show the output of the binding and the interpretation module,

61i.[la,propria,salute,era,necessaria]/one's health was necessary

net(es17a)  
 index:f8  
 pred:essere  
 lex\_form:[np/subj/theme\_bound/[\_] \_]]  
 mood:ind  
 tense:imp  
 cat:esistenza  
 subj/theme\_bound:index:sn49  
   cat:[stato]  
   pred:salute  
   gen:fem  
   num:sing  
   spec:def:+  
   subj/poss:index:sn50  
     cat:[]  
     pred:proprio  
     gen:fem  
     num:sing  
     spec:def:+  
     tab\_ref:[- ref, + pro, + ana, + me, - subj]  
     antecedent:external  
     interpretation:specific  
     tab\_ref:[+ ref, - pro, - ana, + class]  
 acomp/prop:index:saa2  
   cat:[valutativo]  
   pred:necessario  
   gen:fem  
   num:sing  
   subj/prop:index:sn51  
     pred:vbl  
     binder:sn49  
     tab\_ref:[+ ref, - pro, - ana, - me]  
 aspect:state

61ii.[la,propria,salute,e\_,necessaria]/one's health is necessary

net(es17c)  
 index:f8  
 pred:essere  
 lex\_form:[np/subj/theme\_bound/[\_] \_]]  
 mood:ind  
 tense:pres  
 cat:esistenza  
 subj/theme\_bound:indice:sn49  
   cat:[stato]  
   pred:salute  
   gen:fem  
   num:sing  
   spec:def:+  
   subj/poss:index:sn50  
     cat:[]  
     pred:proprio  
     gen:fem  
     num:sing  
     spec:def:+  
     tab\_ref:[- ref, + pro, + ana, + me, - subj]  
     antecedent:external  
     interpretation:arbitrary  
     tab\_ref:[+ ref, - pro, - ana, + class]  
 acomp/prop:index:saa4  
   cat:[valutativo]  
   pred:necessario  
   gen:fem  
   num:sing  
   subj/prop:index:sn51  
     pred:vbl  
     binder:sn49  
     tab\_ref:[+ ref, - pro, - ana, - me]  
 aspect:state

As appears from the value of the attribute "interpretation" only example ii. is assigned arbitrary reading. The discourse module activates then the Logical Form which computes scope for all quantified expressions. Logical Form translates f-structures into well-formed-formulas and then assigns scope. As a result the first sentence has a nominal expression "la salute" which is taken to be referential; in the second case, the arbitrary reading associated to the anaphoric pronoun "proprio" prevents the nominal expression to assume scope, as shown by the two following LF representations,

i. [la, propria, salute, era, necessaria]

input form

```
wff(essere, [term(definito, sn49, wff(and, [wff(salute, [sn49|_2185]), wff(necessario, [sn49])])), wff(necessario,
[sn49, term(state, saa2, wff(and, [wff(situation, [saa2]), []]))], term(state, f8, wff(and, [wff(situation, [f8]), []]))])
```

output form

```
definito(sn49, and(salute(sn49),
  necessario(sn49)),
  state(saa2,
    and(situation(saa2),
      []),
    state(f8,
      and(situation(f8),
        []),
      essere(sn49,
        necessario(sn49, saa2),
        f8))))
```

ii. [la, propria, salute, e\_, necessaria]

input form

```
wff(essere, [term(arbitraria, sn49, wff(and, [wff(salute, [sn49|_1741]), wff(necessario, [sn49])])), wff(necessario,
[sn49, term(state, saa4, wff(and, [wff(situation, [saa4]), []]))], term(state, f8, wff(and, [wff(situation, [f8]), []]))])
```

output form

```
state(saa4,
  and(situation(saa4),
    []),
  state(f8,
    and(situation(f8),
      []),
    arbitraria(sn49, and(salute(sn49),
      necessario(sn49)),
      essere(sn49,
        necessario(sn49, saa4),
        f8))))
```

A completely different result is produced when an empty pronominal, big PRO is introduced into discourse and no generic or arbitrary reading is triggered by the interpretation module. In this case, the pronominal is bound by the topic of discourse and a Continue is produced as a result of discourse state strategy. We include a brief excerpt from the story of the three little pigs:

[il, lupo, stava, gia\_, arrivando, deciso, a, non, rinunciare, al, suo, pranzetto]/within seconds the wolf was arriving determined not to give up his meal

ref\_ex(sn22, lupo, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [animato], subj/agent)/10

ref\_ex(sn27, pranzetto, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [evento, oggetto], obl/theme\_aff)/53

EXPECTED TOPIC : ref\_ex(\_, lupo, \_, nil, mas, sing, [animato], /\_)

SECONDARY TOPIC : ref\_ex(\_, porcellino, \_, \_, mas, plur, [umano, animato], /\_)

POTENTIAL TOPICS : ref\_ex(sn27, pranzetto, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [evento, oggetto], obl/theme\_aff)  
state(18, changing)

[sicuro,di,abbattere,anche,la,casetta,di,mattoni,il,lupo,si,riempi\_,i,polmoni,di,aria,e,comincio\_,a,soffiare,con,forza ,alcune,volte]/convinced that he could also blow the little brick house down, he filled his lungs with air and huffed and puffed a few times

ref\_ex(sn699, lupo, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [animato], subj/agent)/30  
ref\_ex(sn709, aria, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [sostanza, luogo], obl/theme\_nonaff)/43  
ref\_ex(sn701, polmone, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, plur, [oggetto], obj/theme\_aff)/1035  
ref\_ex(sn718, forza, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [modo], obl/modal)/1080  
ref\_ex(sn719, volta, [+ ref, 0def, +, - pro, - ana, + class], nil, fem, plur, [tempo, ripetizione], adj/temporal)/1100

MAIN TOPIC : ref\_ex(, lupo, , nil, mas, sing, [animato], \_/agent)

POTENTIAL TOPICS : ref\_ex(sn709, aria, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [sostanza, luogo], obl/theme\_nonaff)

ref\_ex(sn701, polmone, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, plur, [oggetto], obj/theme\_aff)  
ref\_ex(sn718, forza, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [modo], obl/modal)  
ref\_ex(sn719, volta, [+ ref, 0def, +, - pro, - ana, + class], nil, fem, plur, [tempo, ripetizione], adj/temporal)  
state(19, continue)

[niente,da,fare]/no way

ref\_ex([], pPro, [+ ref, nil, nil, + pro, + ana, - me], , , , [umano, animato], subj/agent)/30

pPro=lupo

MAIN TOPIC : ref\_ex(, lupo, , nil, mas, sing, [animato], \_/agent)

state(20, continue)

[la,casa,non,si,mosse,di,un,solo,palmo]/the house did not move an inch

ref\_ex(sn218, casa, [+ ref, +, nil, - pro, - ana, + class], nil, fem, sing, [oggetto, luogo], sogg/esperiente)/11  
ref\_ex(sn241, palmo, [+ ref, -, nil, - pro, - ana, + class], nil, mas, sing, [misura, luogo, oggetto], obl/misura)/1020

EXPECTED TOPIC : ref\_ex(, casa, , , fem, sing, , /)

SECONDARY TOPIC : ref\_ex(, lupo, , nil, mas, sing, [animato], /)

POTENTIAL TOPICS : ref\_ex(sn241, palmo, [+ ref, -def, nil, - pro, - ana, + class], nil, mas, sing, [misura, luogo, oggetto], obl/measure)

state(21, changing)

[alla,fine,esausto,il,lupo,si,accascio\_,a,terra]/in the end the wolf fell to the ground exhausted

ref\_ex(sn50, lupo, [+ ref, +def, nil, - pro, - ana, + class], nil, mas, sing, [animato], subj/experiencer)/11  
ref\_ex(sn49, fine, [+ ref, +def, nil, - pro, - ana, + class], nil, fem, sing, [evento, tempo], adj/temporal)/70  
ref\_ex(sn57, terra, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [luogo], obj/nil)/1032

MAIN TOPIC : ref\_ex(, lupo, , nil, mas, sing, [animato], \_/experiencer)

SECONDARY TOPIC : ref\_ex(, casa, , , fem, sing, , /)

POTENTIAL TOPICS : ref\_ex(sn49, fine, [+ ref, +def, nil, - pro, - ana, + class], nil, fem, sing, [evento, tempo], adj/temporal)

ref\_ex(sn57, terra, [+ ref, 0def, nil, - pro, - ana, + class], nil, fem, sing, [luogo], obj/nil)

state(22, continue)

## 6. CONCLUSIONS

The number of residual problems is clearly very high, particularly in the role of inferencing mechanisms. We list here below some of these cases:

21. Sentence pronominalization

I don't think you should go to the party, your wife wouldn't like it

## 22. Deverbal nominalization and metonymic reference

I no longer want to ski in the Dolomites. People practise that sport because it is fashionable.

We quote from Moravia, 1954,2:

A. 'The German army had stolen in the villa of the prince the box containing silver cutlery...'

further down in the same text the event reappears as,

B. 'The robbery had actually taken place and the prince had never found his silver cutlery again.'

'The robbery' is related to the action of 'stealing' referred to in a previous part of the text: however to do this, the system must be equipped with very powerful inferencing mechanisms, so that the verb phrase is at first decomposed in its primitives, denoting a certain event, and the same event is recalled by the noun phrase in the following discourse. Work is now in progress in this area using KL-Prolog. As clearly shown by Webber(1988), parts of an event may also be referred to in a subsequent discourse: in this sense tensed clauses, possessing both tense and aspect specification of states and events being spoken of, have a much more complicated structure than definite NPs, even though from a procedural point of view they must be computed in a similar fashion when binding anaphors.

We are also working at a module for summarizing texts which makes of the output of the discourse system ROSIE, and generates natural language from a conversion of LFG grammatical representation into Situational Semantics schemata(Delmonte and Pianta 1991).

P.S. All modules have been implemented in Prolog and run both under MS-Dos and VMS in Quintus Prolog, and Macintosh under MacProlog.

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**Secondary Predication Inside DPs**

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*SECONDARY PREDICATION INSIDE DPs*

Manuel LEONETTI and Vicky ESCANDELL-VIDAL

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## SECONDARY PREDICATION INSIDE DPs.

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### 1. INTRODUCTION

Recent developments in grammatical theory have stressed the existence of thematic and structural similarities between sentences and noun phrases (DPs). Among these similarities we will focus on the fact that both DPs and sentences seem to be able to support secondary predicates (SPs), as shown in the following examples<sup>1</sup>:

- (1) a. [<sub>NP</sub> La entrada de Ernesto *borracho*] causó sorpresa  
The entrance of Ernesto *drunk* caused surprise  
b. Es imprescindible [<sub>NP</sub> la captura de ese animal *vivo*]  
It's absolutely-necessary the capturing of that animal *alive*  
c. [<sub>NP</sub> Su descripción de Juan *en pijama*] nos hizo reír  
Her/his description of Juan *in pyjamas* us<sub>ci</sub> made laugh  
d. [<sub>NP</sub> La difusión de las imágenes *previamente censuradas*] ha suscitado duras críticas  
The diffusion of the images *previously censored* has raised severe criticism
- (2) a. Ernesto entró *borracho*  
Ernesto entered *drunk*  
b. Capturaron *vivo* al animal  
(They)-captured *alive* to-the animal  
c. Describió a Juan *en pijama*  
(She/he)-described (to) Juan *in pyjamas*  
d. Las imágenes las difundieron *previamente censuradas*  
The images them<sub>ci</sub> (they)-difused *previously censored*

Two different approaches to the study of secondary predicates have been proposed in the GB literature: the predication theory<sup>1</sup>, and the small clause theory<sup>1</sup>. We do not intend to take part in such a debated issue; in fact, the following remarks can be maintained independently of one's preferences for either approach.

The aim of this paper is to provide an account of the occurrence of SPs related to a DP inside another DP<sup>1</sup>, i.e., in a structure such as the one in (3):

(3) [<sub>0</sub> ... N° ... DP<sub>1</sub> ... XP<sub>1</sub> ...]

- where XP stands for the secondary predicate
- where the coindexing indicates the subject-predicate relation

We will try to provide an answer to the following questions:

- i) which kind of nominal heads license SPs?
- ii) which kind of SPs can appear inside DPs?
- iii) do the same restrictions apply to SPs in sentences and DPs?

In doing this, we will address some basic issues concerning the thematic and structural properties of DPs, showing how the study of predication relations can throw some light on other aspects of the behaviour of nominals.

## 2. NOMINAL HEADS AND SECONDARY PREDICATES

### 2.1. Nouns and Events

#### 2.1.1. A First Generalization

In trying to answer question i), it can be easily seen that not every nominal head is able to support a SP: the following examples, although they contain the same predicative relation between the same lexical items as in (1), are ill-formed in the relevant interpretation:

- (4) a. \*Reconocieron [<sub>0</sub>, el anillo de Ernesto *borracho*]  
(They)-recognised the ring of Ernesto *drunk*  
b. \*Hemos comprado [<sub>0</sub>, la jaula de ese animal *vivo*]  
(We)-have bought the cage of this animal *alive*  
c. \*Está lista [<sub>0</sub>, la cena de Juan *en pijama*]  
(It)-is ready the dinner of Juan *in pyjamas*  
d. \*Se perdió [<sub>0</sub>, la cinta de las imágenes *previamente censuradas*]  
SE<sub>c1</sub> was-lost lost the film of the images *previously censored*

The contrast between (1) and (4) suggests that the DPs in (4) are headed by nouns which cannot license a SP, because they lack some crucial property of the nouns in (1). At first sight, the main difference would seem to be the fact that *entrada*, *captura*, *descripción* and *difusión* are all derived from a verb and denote an event, while *anillo*, *jaula*, *cena* and *cinta* are not deverbal nouns and do not denote events.

As SPs in sentences always require a basic or primary verbal predication, it is natural to think that in DPs too some sort of "primary predicate" is necessary in order to enable the occurrence of a SP. Event nouns are supposed to behave in the same way as their verbal counterparts in many respects, so they can be considered responsible for the acceptability of SPs inside DPs.

Therefore, a first generalization based on the nature of nominal heads can be suggested, which captures the similarities between sentences and DPs:

- (5) A DP may contain a SP only if its head is an event noun

In this way, the phenomenon in (1) is clearly related to some general principles governing secondary predication, given that some authors<sup>1</sup> have argued that the presence of predicative adjectives depends upon the eventive structure of sentences<sup>1</sup>.

### 2.1.2. Theory of Events

All these facts are clearly related to the concept of *event* or *eventive interpretation*. A theoretical explanation can be found for them, relying on D. Davidson's theory of events, as recently developed by Higginbotham (1985) and others.

According to his proposal, the argument structure of verbs has a special position for an eventive argument <e>; some adjectives and prepositions also contain an <e> position in their  $\theta$ -grid. The assumption is that the licensing of SPs depends on the discharge of the <e> position by  $\theta$ -identification (à la Higginbotham) with the <e> position of the main verb. Obviously, this kind of argument saturation relies crucially on the presence of an <e> position in the structure of both the verb and the SP. The generalization in (5) can thus be restated as "SPs are possible in nominals if the head noun has an <e> position" (i.e., if it is an event noun).

In fact, notions such as *event* have been shown to be relevant to account for certain interesting data, as Hernanz (1988) points out. For instance, it predicts the ungrammaticality of sentences like (6), where the subject-oriented SP occurs with a non-eventive predicate such as a stative verb:

- (6) a. \*María<sub>i</sub> adora la música de Mozart *entusiasmada*<sub>i</sub>  
 María loves the music of Mozart *enthusiastic*  
 b. \*Pedro<sub>i</sub> sabe francés *contento*<sub>i</sub>  
 Pedro knows French *happy*

In addition to this, it explains why *escribir* (to write), which is ambiguous between a property (=to be a writer) and an action reading (=to write/to be writing) in (7)a, maintains only the second reading (which is the only eventive one) when a SP is adjoined, as in (7)b:

- (7) a. María escribe  
 María writes  
 'María is a writer/ María is writing'  
 b. María escribe *contenta*  
 María writes *happy*  
 '\*María is a writer happy/<sup>01</sup>María writes happy/  
<sup>01</sup>María is writing happy'

Needless to say, a nominalization may contain a SP only if

its verbal counterpart is able to accept it as well. Therefore, it is impossible to have nominalizations (if they exist at all) for the sentences in (6):

- (8) a. \*La adoración de María<sub>i</sub> de la música de Mozart  
*entusiasmada<sub>i</sub>*  
The loving of María of the music of Mozart *en-  
thusiastic*  
b. \*El conocimiento del francés de Pedro<sub>i</sub> *contento<sub>i</sub>*  
The knowing of-the French of Pedro *happy*

### 2.1.3. Some Problems

However, the generalization in (5) does not cover the full range of data in the proper way. Consider the following DPs:

- (9) a. Las descripciones de Venecia<sub>i</sub> *inundada<sub>i</sub>*  
The descriptions of Venice *flooded*  
b. Aquellas afirmaciones de Mandela<sub>i</sub> *encarcelado<sub>i</sub>*  
Those statements of Mandela *imprisoned*  
c. Las composiciones de Horacio<sub>i</sub> *desterrado<sub>i</sub>*  
The compositions of Horace *banished*
- (10) a. El retrato de Goya de la Duquesa<sub>i</sub> *desnuda<sub>i</sub>*  
The portrait of Goya of the Duchess *naked*  
b. La foto de Juan<sub>i</sub> *de uniforme<sub>i</sub>*  
The photograph of Juan of (=in his) *uniform*
- (11) a. Las medidas de "Miss Italia"<sub>i</sub> *desnuda<sub>i</sub>*  
The measures of Miss Italia *naked*  
b. El aspecto de Ernesto<sub>i</sub> *en calzoncillos<sub>i</sub>*  
The look of Ernesto *in slips*

Since all these DPs contain a SP, in spite of the fact that they do not denote an event, a different account must be suggested.

The nominal heads in (9) are derived from verbs, and they seem to be the same kind of nominalization that appears in (1). However, as is well known, morphology is sometimes misleading, and deverbal nouns are usually ambiguous between the event/process reading and the result reading. The crucial fact is that the syntactic context in (9) forces the result interpretation<sup>7</sup>, which according to the generalization in (5) should not allow the SP. However, the examples are well-formed.

The DPs in (10) are headed by picture nouns. Picture nouns denote concrete objects, displaying at the same time some "verbal" properties --they are naturally interpreted as having a theme--, but it is clear that they do not denote an event. Again, the occurrence of a SP gives a grammatical result.

Finally, some nouns which are non deverbal and non eventive are able to license a SP within their maximal projection: this possibility is illustrated in (11).

Since the concept of *event* does not seem to be adequate to handle all the relevant cases, a broader notion must be found. Such a notion should be broad enough to cover the

facts presented in (1), (9), (10) and (11), excluding ill-formed examples such as those in (4).

## 2.2. Events, Pictures, and Objects

The distribution of SPs in DPs seems to be sensitive both to the kind of nominal head of the DP, and to the relationship between this head and the DP subject of the SP. In fact, several interesting contrasts can be derived from the distinctions mentioned above, and from the relation between the subject of predication and the head noun. We will present here some empirical evidence for these assumptions, describing the behaviour of different kinds of nominals; an account will be provided in section 2.3.

### 2.2.1. Deverbal Nouns

Most deverbal nouns can be systematically ambiguous between an event and a result reading. Several explanations have been put forward for this fact. It has been argued that deverbal nouns involve two different morphological processes: lexical and syntactic affixation. Picallo (1991) suggests for Catalan an up-to-date version of the ideas and the spirit in Chomsky (1970): she assumes that event nouns are syntactic nominalizations made *via* affixation at S-structure from a category-neutral head, while result nouns are lexical nominalizations and enter D-structure as nouns. In this way, she explains the inheritance of "verbal-like" properties by event nominals. Starting from a very different point of view, Grimshaw (1990) reaches a somehow similar conclusion: she argues that only event nouns are like verbs in that they have an aspectual analysis and, hence, a "real" argument structure; result nominals, on the other hand, lack argument structure.

These two kinds of nominals show different syntactic properties. In Spanish, event nominalizations, when derived from transitive verbs, are mostly "passive" in their internal syntax<sup>9</sup>, as also observed by Cinque (1980) for Italian: the external argument surfaces as a "by-phrase" (*por parte de+DP*)<sup>9</sup>, while the internal argument is introduced by the empty preposition<sup>10</sup> *de*, and can also occur in the prenominal "subject position" as a possessive:

- (12) a. El rescate de Juan por parte de los soldados  
The rescue of John by the soldiers  
b. Su rescate por parte de los soldados  
His rescue by the soldiers

On the other hand, result nominalizations exhibit an "active" structure, with the external and internal arguments introduced by the preposition *de*, showing a typical subject-object asymmetry in that only the external argument can appear as a possessive<sup>11</sup> when both are present<sup>11</sup>:

- (13) a. La imitación de Pepe<sub>1,1st</sub> de Julio Iglesias<sub>11,1st</sub>  
The imitation of Pepe of Julio Iglesias  
b. Su<sub>1</sub> imitación de Julio Iglesias<sub>11</sub>

- His imitation of Julio Iglesias  
 c. \*Su<sub>1</sub> imitación de Pepe<sub>1</sub>,  
 His imitation of Pepe

Concerning monadic predicates, the distinction between ergative and intransitive verbs is maintained in nominalizations, as Picallo (1991) has shown for Catalan with arguments that can be reproduced for Spanish<sup>13</sup>. Ergatives are supposed to be ambiguous between the event and the result reading, while intransitives are considered mostly as results. Both the internal argument of ergative nominals and the external argument of intransitive nominals surface as *de*+DP, behave as subject of NP, and can appear as a possessive:

- (14) a. La desaparición de las joyas  
 The disappearance of the jewels  
 b. Su desaparición  
 Their disappearance
- (15) a. El grito de su hermano pequeño  
 The cry of his brother little  
 b. Su grito  
 His cry

Given that there are differences in the syntactic behaviour of event and result nominals, one should expect some asymmetry between the two groups of nouns concerning the occurrence of SPs: in particular, eventive nominals, which share an important number of properties with verbs, should accept SPs more easily than result nominals. However, at first sight --but see 2.3.3.--, the data do not seem to support clearly such an expectation. Consider the following examples:

- (16) a. El rescate de Juan<sub>i</sub> *moribundo*<sub>i</sub> por parte de los soldados  
 The rescue of Juan *dying* by the soldiers  
 b. El rescate de Juan por parte de los soldados<sub>i</sub> *nerviosos*<sub>i</sub><sup>14</sup>  
 The rescue of Juan by the soldiers *nervous*
- (17) a. La llegada de Roberto<sub>i</sub> *cansado*<sub>i</sub>  
 The arrival of Roberto *tired*  
 b. El paseo de Juana<sub>i</sub> *descalza*<sub>i</sub> por el parque  
 The walk of Juana *barefoot* in the park
- (18) a. Las imitaciones de Pepe<sub>1</sub>, de Juan<sub>1</sub>, *furioso*  
 The imitations of Pepe of Juan *furious*  
 b. Las imitaciones de Juan<sub>1</sub>, de Pepe<sub>1</sub>, *furioso*  
 The imitations of Juan of Pepe *furious*
- (19) a. Una traducción del texto<sub>i</sub> *incompleto*<sub>i</sub>  
 A translation of the text *incomplete*  
 b. Las traducciones de María<sub>i</sub> *inspirada*<sub>i</sub>  
 The translations of María *inspired*

The examples in (16) and (17) contain eventive deverbal nouns, with SPs modifying the internal or the external argument. The same happens in (18) and (19), where the

nominal head is a result noun.

Nevertheless, other examples show that this is not a general property of results, as indicated by the contrasts in (20) and (21):

- (20) a. El hallazgo del prisionero<sub>i</sub>, *maniatado*  
The finding of the prisoner *handcuffed*  
b. \*Los hallazgos del prisionero<sub>i</sub>, *maniatado*  
The findings of the prisoner *handcuffed*
- (21) a. La compra de los coches *recién revisados*  
The purchase of the cars *just revised*  
b. \*Las compras de los coches *recién revisados*  
The purchases of the cars *just revised*

When the head noun denotes an event (as in the singular forms *hallazgo* y *compra*), theme-oriented predicatives are allowed; but they are not if the head noun denotes an object which is the result of a process (as in the plural forms *hallazgos* and *compras*).

On the other hand, SPs oriented to the experiencer or the agent are acceptable even with result nouns, as shown in (22):

- (22) a. Los hallazgos de María<sub>i</sub>, *inspirada*  
The findings of María *inspired*  
b. Las compras de María<sub>i</sub>, *entusiasmada*  
The purchases of María *enthusiastic*

Then, these facts lead the discussion back to the notion of *event*, showing that it can still be relevant for the licensing of some kinds of SPs.

Another interesting fact is that, in eventive nouns, implicit arguments<sup>15</sup> can be subjects of SPs<sup>16</sup>; this is possible both with diadic or transitive predicates, as in (23), and with monadic predicates (intransitives or unaccusatives), as in (24); in addition, implicit arguments can be interpreted as specific (when controlled by another element in the sentence), or arbitrary (when free):

- (23) a. [<sub>0</sub>] La [e]<sub>i</sub> detención de "El Pelos" *disfrazada de camarera*<sub>i//j</sub>] le<sub>i</sub> valió a María<sub>i</sub> un ascenso  
The arrest of "El Pelos" *dressed*<sub>///</sub> of (=as a) waitress to-her<sup>14</sup> yielded to María a promotion  
b. [<sub>0</sub>] La [e]<sub>i</sub> proclamación de los resultados *borracho*<sub>i//j</sub>] le<sub>i</sub> costará el cargo  
The proclamation of the results *drunk* to-him<sub>i</sub> will-cost the post
- (24) a. [<sub>0</sub>] La [e]<sub>i</sub> presentación ante el capitán *mal afeitado*<sub>i</sub>] es motivo de sanción<sup>17</sup>  
The appearance in-the-presence-of the captain *badly shaved* is motive of punishment  
b. [<sub>0</sub>] Aquel [e]<sub>i</sub> paseo *descalza*<sub>i//j</sub> por el parque] le<sub>i</sub> destrozó los pies  
That walk *barefoot* in the park to-her<sub>i</sub> destroyed the feet

It must be added that not every deverbal noun allows SPs in its maximal projection; in agentive nominalizations, for instance, SPs are impossible. Consider the following examples, in which *-dor/-tor* (*-er*) is the nominal suffix:

- (25) a. El comprador del traje barato  
The buyer of-the suit cheap  
b. El vendedor de las manzanas podridas  
The seller of the apples rotten  
c. El constructor de la casa grande  
The builder of the house big

These DPs are well-formed only if the adjective acts as an internal modifier; the predicative reading is impossible for them, in spite of the fact that it is perfectly acceptable in the sentential counterparts in (26):

- (26) a. Compró el traje *barato*/(El traje) lo compró *barato*<sup>13</sup>  
(She/he)-bought the suit *cheap*/The suit it<sub>ci</sub>  
(she/he)-bought *cheap*  
b. Vendía las manzanas *podridas*/(Las manzanas) las vendía *podridas*  
(She/he)-sold the apples *rotten*/The apples them<sub>ci</sub> (she/he)-sold *rotten*  
c. Bebe el café *caliente*/(El café) lo bebe *caliente*  
(She/he)-drinks the coffee *hot*/The coffee it<sub>ci</sub>  
(she/he)-drinks *hot*  
d. Construyó la casa *grande*/(La casa) la construyó *grande*  
(She/he)-built the house *big*/The house it<sub>ci</sub>  
(she/he)-built *big*

Agentive nominalizations in *-dor/-tor*, then, lack the capacity of making secondary predication possible.

### 2.2.2. Picture Nouns

As is well known, lexical items such as *foto* (photograph), *cuadro* (picture) or *retrato* (portrait) can occur with complements which can be interpreted as the agent (27b), the theme (27c) or the possessor (27d):

- (27) a. La foto de Roberto  
The photograph of Roberto  
b. The photograph taken by Roberto  
c. The photograph in which Roberto appears  
d. The photograph owned by Roberto

Picture nouns display properties very similar to those of deverbal nouns in accepting SPs. Notice that in (28), with the adjective *descalzo* (barefoot) as a SP, the DP *Roberto* can only be interpreted as the theme of the photograph:

- (28) La foto de Roberto *descalzo*  
The photograph of Roberto *barefoot*

The readings in which Roberto is the "agent" (29a), or the possessor (29b) are impossible:

- (29) a. The photograph taken by Roberto barefoot  
 b. The photograph owned by Roberto barefoot

This effect could be due to a pragmatic reason, namely the difficulty of conceiving the property of 'being barefoot' in example (28) as a relevant condition for a photographer or a simple possessor; the agent-oriented reading can be forced to occur if we choose a more natural property in the predicative AP, as in (30):

- (30) Los cuadros de Ernesto<sub>i</sub>, *borracho* son mejores que los que pinta *sobrio*<sup>13</sup>  
 The pictures of Ernesto drunk are better than the ones he paints sober

When two complements are present, again the SP is naturally interpreted as referring to the theme, but not to the agent, and therefore, (31a) is not ambiguous; however, the ambiguity does appear in the corresponding sentence (31b):

- (31) a. El retrato de Velázquez<sub>i</sub> de Felipe IV<sub>j</sub> *sentado*<sub>i,j</sub>  
 The portrait of Velázquez of Felipe IV *seated*  
 b. Velázquez<sub>i</sub> retrató a Felipe IV<sub>j</sub> *sentado*<sub>i,j</sub>  
 Velázquez portrayed to Felipe IV *seated*

In the examples in (31) the pragmatic explanation does not work, since the sentence in (31b) is acceptable, but the corresponding DP in (31a) is not. In DPs headed by picture nouns, then, the occurrence of agent-oriented SPs is much more constrained than the occurrence of theme-oriented SPs.

A related difference has to do with implicit arguments. As seen above, SPs can refer to implicit arguments in DPs headed by eventive nouns; when the head is a picture noun, this is not allowed for agent-oriented SPs, but it is possible for theme-oriented SPs:

- (32) a. El retrato del Rey<sub>i</sub> *sentado*<sub>i,j</sub>  
 The portrait of-the King *seated*  
 b. Me<sub>i</sub> gustaría [PRO<sub>i</sub> tener un retrato [e]<sub>i</sub> *vestido de explorador*<sub>i,j</sub>]  
 To-me<sub>i</sub> (it)-would-like to have a portrait *dressed of (=as an) explorer*  
 c. Un retrato [e]<sub>i</sub> *de uniforme*<sub>i,j</sub> siempre queda bien  
 A portrait *in uniform* always looks good.

(32a) is ill-formed if *sentado* (seated) is interpreted as oriented to an implicit agent; (32b) and (32c), on the other hand, contain well-formed theme-oriented SPs, with a specific (clitic-controlled) implicit theme in the first case, and an arbitrary or generic one in the second case.

To sum up, the occurrence of SPs with picture nouns is more restricted than with eventive nouns, but not so

restricted as with result nouns denoting concrete objects.

### 2.2.3. Other Nouns

As shown by the examples in (11), SPs are possible with nominal heads not belonging to the two classes mentioned above. Recall the contrast between (4) and (11), repeated here as (33) and (34):

- (33) a. \*Reconocieron [<sub>NP</sub> el anillo de Ernesto *borracho*]  
b. \*Hemos comprado [<sub>NP</sub> la jaula de ese animal *vivo*]  
c. \*Está lista [<sub>NP</sub> la cena de Juan *en pijama*]<sup>10</sup>  
d. \*Se perdió [<sub>NP</sub> la cinta de las imágenes *previamente censuradas*]
- (34) a. Las medidas de Miss Italia *desnuda*  
b. El aspecto de Ernesto *en calzoncillos*

What is the difference between the head nouns in (33) and (34)? Intuitively, nouns such as *medidas* and *aspecto* are intrinsically "relational" (i.e., when we speak about measures, weight or look, we usually presuppose that they are someone's, or something's, measurements, weight or look). In a way, relational nouns can be said to be "obligatorily transitive", since they need a complement that specifies the person or the thing to which the property denoted by the noun must be attributed<sup>11</sup>. The set of relational nouns includes those lexical items involved in a relationship of inalienable possession, such as body-parts and parts of things, and kinship terms: they imply some mention of a "possessor" or related element. On the other hand, concrete nouns which simply denote objects cannot be said to be "transitive" in this way: a glass is not inherently someone's glass. In order to define the meaning of the word *glass*, it is not necessary to mention any other entity related to the object; but a definition of the meaning of *shape* or *weight*, entails the notion that *shape* or *weight* are always "properties" of an object.

Kinship terms seem to be an exception among relational nouns, because they do not accept SPs:

- (35) a. \*El hermano de María *enferma*  
The brother of María *ill*  
b. \*La nieta de Ernesto *furioso*  
The grand-daughter of Ernesto *furious*

The relation between head and complement in these examples is such that it does not allow temporal or aspectual modifications: when someone is someone else's relative, this tie is not subject to contingent changes. Therefore, SPs with kinship terms are excluded on independent pragmatic grounds.

A similar explanation can be put forward for the oddity of examples with body-part nouns. Compare (36a) and (36b):

- (36) a. ?La pierna de Pepe *enfermo*  
The leg of Pepe *ill*  
b. La nariz de Pepe *borracho*  
The nose of Pepe *drunk*

In the second case, it is easy to conceive the nose as a thing whose aspect can vary according to the state of Pepe, sober or drunk, while in the first case such a variation is not as easy to imagine concerning a leg. Consider also the conditions for interpreting (37):

- (37) El único amigo de Pedro *borracho* es Luis.  
The only friend of Pedro *drunk* is Luis

*Amigo* (friend) denotes a relationship which, prototypically, is not supposed to be subject to temporary variations; but the presence of the predicative AP *borracho* (drunk) indicates just this sort of change and forces an interpretation which can be paraphrased as "The only real friend of Pedro when he is drunk is Luis."

To sum up, the acceptability of SPs with relational nouns is tied to the possibility of conceiving this sort of temporary variations in the relationship expressed by the noun and its complement. This can be seen as a general condition applying also to other kinds of noun (see 3.2.2). Relational nouns, when they allow temporal modifications, behave like deverbal and picture nouns in their acceptance of SPs. In some cases, they even accept implicit arguments with an arbitrary interpretation as subjects of SPs:

- (38) a. Las medidas *desnuda* son un factor importante en cualquier concurso de belleza.  
The measures *naked* are an important factor in any beauty contest  
b. Lo que cuenta es la altura *descalzo*  
What counts is the height *barefoot*

The dichotomy relational/non-relational also helps to explain some subtle differences in the behaviour of nouns with a similar meaning:

- (39) a. Las memorias de Juan *encarcelado*  
The memoirs of Juan *imprisoned*  
b. ?El libro de Juan *encarcelado*  
The book of Juan *imprisoned*

Although *memorias* and *libro* could have the same referent, the first noun accepts a SP inside its maximal projection more easily, and it is due to its relational nature.

Relational nouns, then, select a complement in a way that resembles complement selection by verbs. This seems to be the crucial property involved in SP licensing: relational nouns, when the relationship they denote is subject to temporary variation, allow instances of SP for their complement.

## 2.3. The Licensing of SPs

### 2.3.1. Argument Structure and Thematic Structure

The previous discussion leads to the natural conclusion that in fact the notion of *event* is not the only relevant

one in explaining the occurrence of SPs in DPs. A more general property shared by deverbal, picture and relational nouns must be responsible for the facts noted above. Our claim is that this property is the capacity of the head noun to select arguments. The resulting generalization can be stated informally as follows:

- (40) A head noun N licenses SPs inside its projection only for its arguments<sup>11</sup>

This assertion relies on the existence of argument structure in nouns. In fact, this is a much debated issue<sup>11</sup>. In a recent study, Grimshaw (1990) has suggested a very narrow concept of argument structure (AS): according to her, AS is a representation of prominence relations among the arguments of a head, determined by the interaction of two different levels: thematic representation (which contains some information on  $\theta$ -participants), and event structure (which accounts for the aspectual analysis). In her proposal, only complex event nouns have AS in the proper sense (i.e., both a thematic and an aspectual level of representation), which explains the well-known asymmetries between event and result readings.

If so, the licensing of SPs cannot rely upon AS, since it has been shown that both event and result deverbal nouns, picture nouns, and relational nouns accept SPs. The only property shared by all these kinds of nominals is that of having thematic structure, in Grimshaw's terms. All nouns have a lexical-conceptual structure (LCS) which may contain participants: the ordered set of participants constitutes their thematic structure. When LCS projects into syntax, each projected participant is  $\theta$ -marked by the head noun, regardless of its syntactic realization. Then, we could restate the generalization in (40) as in (41):

- (41) A head noun N licenses SPs inside its projection only for elements of its thematic (LCS) structure

Now, we can check the predictions of this generalization.

### 2.3.2. Some Consequences

According to (41), only  $\theta$ -marked complements can be subjects of SP inside a DP. If this is right, one should expect that non  $\theta$ -marked modifiers or adjuncts will not be able to be subjects of SP. In fact, this first prediction happens to be correct: modifiers indicating alienable possession are not  $\theta$ -marked, while, as we argued above, inalienable "possessors" are  $\theta$ -marked; hence the following contrast between (42)(alienable) and (43)(inalienable) is easily explained:

- (42) a. \*Los zapatos de Ernesto *dolorido*  
The shoes of Ernesto *hurt*  
b. \*El coche de Juan *feliz*  
The car of Juan *happy*

- (43) a. La mirada de Ernesto *enamorado*  
The gaze of Ernesto *in-love*

b. La cara de Juan *contento*  
The face of Juan *glad*

The generalization in (41) successfully predicts the contrast between (42) and (43); but, in a sense, it is too weak, since it does not permit to make predictions about which elements of the thematic structure will be able to act as subjects of SPs. As it is stated, (41) does not provide an answer to two questions: 1) do all LCS elements display the same properties?; and 2) if they do not, which ones will be suitable subjects for SPs? A more restrictive generalization is needed.

Suppose that the answer to the first question is affirmative. If so, we would have to account for a pair of counterexamples to the statement that there is a uniform correlation between LCS elements and SPs.

The first problem is the behaviour of result nominals. Object-oriented predicatives seem to be excluded when the noun denotes an object:

- (44) a. \*Los hallazgos del encarcelado<sub>1</sub>, *maniatado*  
The findings of the prisoner *handcuffed*  
b. \*Las compras de los coches<sub>1</sub>, *recién revisados*  
The purchases of the cars *just revised*

The fact of denoting an object cannot be the reason for this unacceptability: if picture nouns such as *fotografía* (photograph) or *retrato* (portrait) also denote objects, why are they able to license object-oriented predicatives, as in (45)?:

- (45) a. Las fotos de Elena *descalza*  
The photographs of Elena *barefoot*  
b. Los retratos del Rey *sentado*  
The portraits of-the King *seated*

This difference can be easily explained, if one takes into account the following considerations. Several authors, following Williams (1981) and Di Sciullo & Williams (1987), have claimed that nouns have as their external argument a non-thematic relation R, which must be satisfied by predication or by reference. When the DP headed by a noun is used referentially, the external argument R equals the denoted object. In a number of result nominalizations (in those that denote an object), R is identified both with an LCS element of the head, and with the referred object. As observed by Grimshaw (1990: 102-104), this identification between R and one of the LCS elements is a crucial factor in preventing the licensing of certain complements of the head noun.

We will adopt here Grimshaw's line of reasoning to explain the absence of SPs in some result nominals: if one of the LCS elements is identified with R, then it cannot project into a direct LCS complement. This is why the examples in (44) are ill-formed. Obviously, if direct LCS complements are not licensed, no instance of SP is expected to appear. In picture nouns, on the other hand, R is not identified with any of the LCS elements: this makes the noun transparent for LCS licensing of complements, and hence, of

SPs. In this respect, one can predict that deverbal result nouns in which there is no identification between R and a LCS argument will behave as picture nouns, allowing SPs for their internal argument: in fact, this is the case of nominals indicating some kind of representation, like *descripción*.

In this way, result nouns are no longer a counterexample to the idea of a uniform correlation between LCS elements and SPs, because there is an intervening factor: the identification with R. In these cases, result nouns prevent the projection of one of their LCS elements.

A second problem can be found in the behaviour of agentive nominalizations in *tor/dor*, which do not allow the occurrence of SPs. The examples in (25), repeated here as (46), are ill-formed in the relevant interpretation:

- (46) a. \*El comprador del traje *barato*  
The buyer of-the suit *cheap*  
b. \*El vendedor de las manzanas *podridas*  
The seller of the apples *rotten*  
c. \*El constructor de la casa *grande*  
The builder of the house *big*

Notice that such nominalizations do not allow SPs in their projection even when they are eventive. It is an unexpected phenomenon, since they seem to inherit at least some of the properties of their corresponding verbs.

As in the case of result nouns, the solution relies on the role of the R element: again, there is an LCS element identified with R. Agentive derived nouns denote individuals which play the role of agent of the corresponding verbs. This is why a complement indicating the agent (for example, a "by-phrase") cannot occur with an agentive noun:

- (47) \*El comprador del traje por Juan  
The buyer of-the suit by Juan

For the same reason, no agent-oriented SPs will appear, and control of a PRO in a subordinate clause will be impossible, as noted by Jaeggli (1986). The agent argument is thus syntactically inert.

Now, the absence of object-oriented SPs can be seen as a consequence of the identification of R with the most prominent element in LCS. We cannot offer a fully worked-out solution yet, but probably the blocking of the most prominent element will be responsible for the blocking of the less prominent elements. In a sense, the opacity induced in LCS by the identification of one of its elements with R seems to follow the thematic hierarchy: notice that in result nouns, the identification of the theme (internal) argument with the referent does not block the appearance of agent-oriented SPs, while the identification of the agent with R blocks even theme-oriented SPs in agentive nouns.

Bearing in mind these facts, the generalization in (41) can now be restated in a more precise way:

- (48) A head noun N licenses SPs inside its projection for all and only the transparent elements of its LCS.

There is still one point which should be mentioned. If the generalization in (48) is correct, one is led to say that picture nouns display a "complete" thematic structure (with a theme and an agent), since examples such as (30) show the possibility of having an agent-oriented SP. However, it does not seem "natural" to posit an agentive element in the LCS of picture nouns: in spite of the fact that photographs, portraits and pictures are results of human activities, a portrait is intrinsically defined only as an image of someone, a photograph is only a view of someone or something, and so forth. As suggested to us by A.-M. Di Sciullo (personal communication), picture nouns "lack" an agentive argument just because they are not deverbal nouns, so they are not supposed to inherit any thematic structure from another word; moreover, verbs such as *fotografiar* (to photograph) or *retratar* (to portray) are derived from picture nouns by means of a causativization process which adds the external argument. From this point of view, no agentive argument is expected to be syntactically active in DPs headed by picture nouns. Why, then, are agent-oriented SPs allowed with picture nouns?

We believe that the "agent" of a picture noun, although it is not a constituent part of the thematic structure of *picture*, can be pragmatically evoked and recovered: when the context forces the agentive interpretation for a complement, an effect of LCS extension is obtained. The same effect appears whenever an agent can be evoked or "added", even if the head noun lacks thematic structure at all, as in (49):

- (49) Los discos de Pepe *inspirado*  
The records of Pepe *inspired*

When Pepe is the owner of the records, the SP is not allowed, as expected for a possessor; on the other hand, if Pepe is given an agentive reading, the sequence can be acceptable because we are supplying the noun *records* with a thematic element.

Anyway, these "agents" do not display all the syntactic properties of real LCS agents. Our proposal receives further support from the fact that "agents" in picture nouns are not able to control a PRO in a rationale clause, as shown in (50):

- (50) a. \*El retrato de Juan<sub>i</sub>, de la princesa<sub>i</sub> para  
[PRO obtener el favor del Rey]  
The portrait of Juan of the princess to obtain  
the favour of-the King  
b. \*La foto de Ernesto<sub>i</sub>, de María<sub>i</sub> para [PRO im-  
presionarla]  
The photograph of Ernesto of María to impress  
her

The examples in (50) indicate that "agents" of picture nouns cannot pass a well-known test for agentive arguments. This explains the fact that the acceptability of examples such as (30) and (49) is quite restricted.

### 2.3.3. Two Kinds of Secondary Predicates

The generalization in (48) seems to be descriptively adequate; however, it leads to the theoretically undesirable conclusion that the licensing of SPs in DPs does not depend on the same factors as in sentences. As a matter of fact, (48) implies that the notion of *event* is irrelevant to explain the occurrence of SPs in DPs; but we saw that it is not at all irrelevant to explain their occurrence in sentences (see section 2.1.3). We would like to claim that the concepts of *event* and *eventive reading* are still important as far as DPs are concerned; in this way, the parallelism between sentences and DPs could be maintained.

Actually, it would be quite surprising if event and result nominals behaved exactly the same way in their acceptance of SPs, because they show different properties in many respects. In fact, certain contrasts can be related to the presence or absence of an eventive interpretation: in particular, agent-oriented SPs seem to be especially sensitive to the eventive reading. Syntactic tests like possessivization and dislocation can throw some light on them. Consider the following paradigms, in which the subject of predication appears as a possessive:

- (51) a. Su<sub>i</sub> aparición *borracho*<sub>i</sub>  
His appearance *drunk*  
b. Su<sub>i</sub> captura *vivo*<sub>i</sub>  
His capture *alive*  
c. Su<sub>i</sub> foto *descalzo*<sub>i</sub>  
His photograph *barefoot*  
d. Su<sub>i</sub> retrato *sentado*<sub>i</sub>  
His portrait *seated*  
e. Sus<sub>i</sub> medidas *desnuda*<sub>i</sub>  
Her measures *naked*  
f. Su<sub>i</sub> aspecto *en calzoncillos*<sub>i</sub>  
His look *in slips*
- (52) a. Su<sub>i</sub> paseo *descalza*<sub>i</sub>  
Her walk *barefoot*  
b. Su<sub>i</sub> actuación *disfrazado*<sub>i</sub> *de Aladino*  
His performance *dressed of (=as) Aladino*  
c. Su<sub>i</sub> intervención *furioso*<sub>i</sub>  
His speech *furious*  
d. ?/Sus<sub>i</sub> afirmaciones *encarcelado*<sub>i</sub>  
His statements *imprisoned*  
e. ?/Sus<sub>i</sub> composiciones *desterrado*<sub>i</sub>  
His compositions *banished*  
f. ?/Sus<sub>i</sub> fotos *sobrio*<sub>i</sub>  
His photographs *sober*

In (51), the SPs are all predicated of an internal argument, and the constructions are well-formed, irrespective of the kind of noun head. In (52), on the other hand, the SPs are agent-oriented, and only when the noun is eventive, we get a completely acceptable sequence. Leaving aside other intervening factors such as affectedness, the facts in (52) suggest that agent-oriented SPs behave in different ways depending on the eventive status of the head noun, while theme-oriented SPs display a uniform behaviour.

Moreover, the contrast in (52) reappears in quite the

same way in dislocated structures:

- (53) a. De Juana<sub>i</sub>, recuerdo aquel paseo *descalza*<sub>i</sub>  
Of Juana, I remember that walk *barefoot*
- b. De Manuel<sub>i</sub>, me gustó la actuación *disfrazado*<sub>i</sub> de *Aladino*  
Of Manuel, to-me<sub>i</sub> (it)-pleased the performance *dressed of Aladino*
- c. De él<sub>i</sub>, sólo recuerdo aquella intervención *furioso*<sub>i</sub>  
Of him, only (I)-remember that speech *furious*
- d. \*De Mandela<sub>i</sub>, escuché las afirmaciones *encarcelado*<sub>i</sub>  
Of Mandela, (I)-heard the statements *imprisoned*
- e. \*De Horacio<sub>i</sub>, no he leído las composiciones *desterrado*<sub>i</sub>  
Of Horace, not (I)-have read the compositions *banished*
- f. \*De Pepe<sub>i</sub>, me gustan las fotos *sobrio*<sub>i</sub>  
Of Pepe, to-me<sub>i</sub> (they)-please the photographs *sober*

When there is no event, agent-oriented SPs do not admit to be separated from their subjects, so strict adjacency is required, as shown by the contrast in (54) and (55):

- (54) a. El paseo de Juana<sub>i</sub> por el parque *descalza*<sub>i</sub>  
The walk of Juana by (=in) the park *barefoot*
- b. La actuación de Manuel<sub>i</sub> en el colegio *disfrazado*<sub>i</sub> de *Aladino*  
The performance of Manuel in (=at) the school *dressed of Aladino*
- c. La intervención de Pepe<sub>i</sub> en la reunión *furioso*<sub>i</sub>  
The speech of Pepe in the meeting *furious*
- d. \*Las afirmaciones de Mandela<sub>i</sub> para los periodistas *encarcelado*<sub>i</sub>  
The statements of Mandela for the reporters *imprisoned*
- e. \*Las composiciones de Horacio<sub>i</sub> a su amada *desterrado*<sub>i</sub>  
The compositions of Horacio to his lover *banished*
- f. \*Las fotos de Pepe<sub>i</sub> en el jardín *sobrio*<sub>i</sub>  
The photographs of Pepe in the garden *sober*
- (55) a. El paseo de Juana<sub>i</sub> *descalza*<sub>i</sub> por el parque  
b. La actuación en el colegio de Manuel<sub>i</sub> *disfrazado*<sub>i</sub> de *Aladino*  
c. La intervención en la reunión de Pepe<sub>i</sub> *furioso*<sub>i</sub>  
d. Las afirmaciones para la prensa de Mandela<sub>i</sub> *encarcelado*<sub>i</sub>  
e. Las composiciones a su amada de Horacio<sub>i</sub> *desterrado*<sub>i</sub>  
f. Las fotos de Pepe<sub>i</sub> *sobrio*<sub>i</sub> en el jardín

Both possessivization and dislocation can be used as constituency tests inside DPs; they indicate that in the examples with non-eventive nominals, the (agent) subject and its predicate do not behave as independent elements: this

seems to suggest that, when there is no event, agent-oriented SPs form a single constituent with their subjects. In eventive nominals, on the other hand, SPs appear in the standard configuration, as independent adjuncts, not included in the projection of their own subjects.

When SPs are internal adjuncts, they have syntactic properties very close to those of nominal appositions. Then, they can be given a representation like the following one<sup>14</sup>:

(56) [<sub>NP</sub> [<sub>SP</sub> ]<sub>i</sub> [<sub>NP</sub> ]<sub>i</sub> ]

To sum up, there seems to be a correlation between the absence of the eventive interpretation in the nominal, and the loss of certain syntactic properties by the agent argument. It can be seen as a natural effect, since in non-eventive nominals there is no complete argument structure in Grimshaw's terms, and hence agents are no longer the most prominent element. In this way, the parallelism between sentences and DPs can be maintained: as we saw in 2.1, agent-oriented SPs are dependent on the existence of event, while theme-oriented SPs are not; the same is true for SPs in DPs. It is just because of this aspectual restriction on the distribution of agent-oriented SPs that only a very special type of them (the DP-internal adjunct) can appear in non-eventive DPs. Thus, the notion of *event* is still relevant, and in the same way, both for sentences and DPs.

### 3. KINDS OF PREDICATES

In the previous section we have tried to give an answer to the question of which kind of nominal heads can license a SP. Here, we will be concerned with our second question: which kind of SPs can appear inside DPs?

#### 3.1. No Subcategorized Small Clauses in DPs

We will assume that the small clause analysis is adequate at least in the cases of so-called "subcategorized small clauses", which appear with verbs like *considerar* and *declarar*, as in:

- (57) a. Consideramos [<sub>sc</sub> importante este acuerdo]  
 (We)-consider important this agreement  
 b. Declaro [<sub>sc</sub> abierta la sesión]  
 (I)-declare open the session

Subcategorized small clauses differ from other cases of secondary predication in several important respects: while small clauses of the type illustrated in (57) are arguments selected and  $\theta$ -marked by a lexical head, SPs such as those in (58) --whatever analysis one may choose for them-- appear in non-subcategorized positions and can be considered as some kind of adjunct.

- (58) a. Regresó *satisfecho*  
 (She/he)-came-back *satisfied*  
 b. Compramos el pan *todavía caliente*  
 (We)-bought the bread *still hot*

In (57), the APs cannot be deleted without obtaining an ungrammatical sentence, as shown in (59); but in (58) they can be eliminated, as illustrated in (60):

- (59) a. \*Consideramos este acuerdo  
 (We)-consider this agreement  
 b. \*Declaro la sesión  
 (I)-declare the session

- (60) a. Regresó  
 (She/he)-came-back  
 b. Compramos el pan  
 (We)-bought the bread

The first thing to be noticed when one looks at what happens inside DPs is that small clauses equivalent to those in (57) are impossible, while adjunct SPs are allowed --more precisely, all the examples of SPs in DPs until now have been cases of adjunct predicates. The nominals in (61) have been obtained from the small clause construction in (57), and then they are ill-formed; on the contrary, the nominals in (62) have been derived from the adjunct predicate constructions in (58), and they are fully grammatical:

- (61) a. \*La consideración de este acuerdo *importante*  
 The consideration of this agreement *important*  
 b. \*La declaración de la sesión *abierta*  
 The declaration of the session *open*
- (62) a. El regreso de Juan *satisfecho*  
 The return of Juan *satisfied*  
 b. La compra del pan *todavía caliente*  
 The buying of the bread *still hot*

Why should adjuncts be the only class of SPs allowed inside a DP? This fact is a consequence of a more general difference between nouns and verbs: verbs are able to select small clauses as arguments and to case-mark the subject DP of these constituents, but nouns do not share this feature.

Chomsky (1986) offers a well known explanation for this contrast. Verbs assign structural case to the DPs governed by them, so they can (under the proper conditions) mark with Accusative a DP they do not  $\theta$ -mark, such as the subject of a small clause. Nouns are not structural case-assigners, and they can give so-called inherent case only to DPs which they  $\theta$ -mark at the same time: for a noun to assign inherent case, the  $\theta$ -marking of an argument is required.

Now, the nominal property of assigning inherent case is responsible for the ill-formedness of (61), because the subjects of the small clauses (*este acuerdo* and *la sesión*) cannot obtain case from a head by which they are not  $\theta$ -marked. The construction, then, cannot be saved by the insertion of a preposition like *de*.

Recent work by Cinque (1990) offers a slightly different approach which leads, however, to the same results: this property of nouns can be looked at as a consequence of the definition of barrier for government. According to Cinque (1990), a maximal projection is a barrier for government if it is not directly selected by a [+V] head. Then, nouns, being [-V], will not be able to govern inside a lower XP, and consequently to assign case to the subject of a small clause. A similar claim was made by Kayne (1984): nouns are non-structural governors, so they can govern only elements subcategorized by them.

The same mechanism which accounts for the lack of small clause complements in nominals can also help to explain other related phenomena. First, it explains why DPs do not contain Exceptional Case Marking (ECM) constructions in English, as illustrated by (63):

(63) \*The belief of him to be a good cook

Again the subject of the embedded predication cannot receive case from the head noun because it is not  $\theta$ -marked by it, and the structure results in a Case-Filter violation.

A similar explanation can be suggested for the absence of Raising in DPs, as exemplified in:

(64) \*John's<sub>i</sub> appearance t<sub>i</sub> to leave

This fact was noted in Williams (1982). He argued that Raising is impossible because the predication relation that should exist between *John* and *appearance to leave* cannot hold, given that the second constituent is not a maximal projection and, therefore, cannot be a predicate<sup>15</sup>. Hornstein and Lightfoot (1987) suggest, against Williams, that the ungrammaticality of (64) is not due to some constraint on predication, but rather to the unavailability of inherent case for the DP *John*, which is not an argument of the head noun *appearance*. G. Cinque (personal communication) observes that this explanation cannot be correct: we obtain an ill-formed result even if we replace *John* with PRO, which does not require to receive case:

(65) \*The PRO appearance to leave

Then, there are no Case-Filter violations in (64) and (65); according to Cinque, raising is impossible in DPs because nouns are not able to head-govern the trace of the raised element across IP.

Finally, if the preceding remarks are on the right track, the impossibility of subcategorized small clauses in DPs provides evidence for not considering Spanish resultative<sup>16</sup> predicates as subcategorized small clauses. Compared to English, Spanish has a very limited number of resultative SPs in sentences. In fact, constructions such as the English ones in (66) do not exist at all:

- (66) a. John hammered the metal *flat*  
       \*Juan martilleó el metal *plano*  
       b. John drunk himself *silly*  
       \*Juan se emborrachó *estúpido*

However, some resultative APs seem to be able to appear in DPs:

- (67) a. La colocación de las mesas *juntas*  
The setting of the tables *together*  
b. La fabricación de los tornillos *demasiado grandes*  
The making of the screws *too big*

This leads to the conclusion that, at least in Spanish, they should not be given a subcategorized small clause analysis, providing evidence for their adjunct status. However, a more accurate study of the data will suggest a different solution; we will return to this issue below.

### 3.2. Two Restrictions on SPs in DPs

There are two strong restrictions on the type of SPs allowed in nominals: the first one determines the categorial nature of the predicate; and the second, its semantic nature. These restrictions can also be derived from the lack of subcategorized small clauses in DPs.

#### 3.2.1. The Categorial Restriction

The generalization concerning categorial status can be expressed as follows:

- (68) A DP cannot be a SP inside another DP<sup>17</sup>.

This implies that only APs and PPs (and, in some cases, NPs) can be predicated of a DP inside a nominal. This is not a stipulative condition, but follows naturally from the facts noted above: in sentences, DPs can be SPs only when they are selected by certain verbal heads as small clause constituents; since these structures are not allowed inside DPs, the SPs must be adjectival or prepositional. Compare the sentence in (69a) and the DP in (69b), in which the predication can be nominal only if preceded by the preposition *como*<sup>18</sup>:

- (69) a. Considero a Juan *mi mejor amigo*  
(I)-consider Juan *my best friend*  
b. La consideración de Juan *\*(como) mi mejor amigo*  
The consideration of Juan *\*(as) my best friend*

#### 3.2.2. The Semantic Restriction

The second restriction has to do with the semantic properties of the predicate, and can be stated as follows:

- (70) Only stage-level predicates can appear as adjunct SPs in DPs.

The distinction between *stage-level* and *individual-level* predicates was introduced by Carlson (1977) to account for the various readings of English bare plural subjects<sup>19</sup>.

Carlson argues that predicates such as *intelligent* or *tall* apply to individuals (which can be objects or kinds), and express permanent properties; on the other hand, predicates such as *available* or *drunk* apply to stages (i.e., space-time slices of an individual), and express transitory properties. Individual-level predicates impose a generic reading on bare plural subjects, while stage-level predicates impose an existential one. Existential sentences and absolute constructions are also sensitive to Carlson's distinction. In Spanish individual-level predicates are preceded by the copula *ser*, while stage-level predicates must be construed with the copula *estar*.

Rapoport (1990) has claimed that the behaviour of adjunct SPs in sentences is also dependent on this contrast<sup>10</sup>. She argues that adjunct secondary predicate constructions are restricted to stage-level predicates, as illustrated by the contrast between (71) and (72):

- (71) a. Ayala bought the dog *sick*  
 b. Ayala cut the bread *wet*
- (72) a. \*Ayala bought the dog *intelligent*  
 b. \*Ayala cut the bread *white*

While stage-level predicates as *sick* and *wet* can be adjunct SPs, individual-level predicates as *intelligent* and *white* cannot, leading to the ill-formed examples in (72). The ungrammaticality of DPs as adjunct predicates<sup>11</sup> can be also explained on these grounds, if one assumes that DPs are individual-level. Notice that in Spanish a predicative DP in a copular sentence selects obligatorily the verb *ser*, which is the copula for individual-level predicates. This fact must be related to the non occurrence of DPs as adjunct predicates.

### 3.3. Some Apparent Problems

Rapoport's account seems to cover the English data properly, but it is necessary to add some remarks concerning Spanish. Several examples can be found of SPs which clearly belong to the individual-level type, but cannot be considered as the predicate of a subcategorized small clause. These examples fall into two different categories: the first is the resultative construction illustrated above in (67); the second is the class of depictive predicates which occur with verbs like *comprar* (to buy), *encontrar* (to find) or *elegir* (to choose).

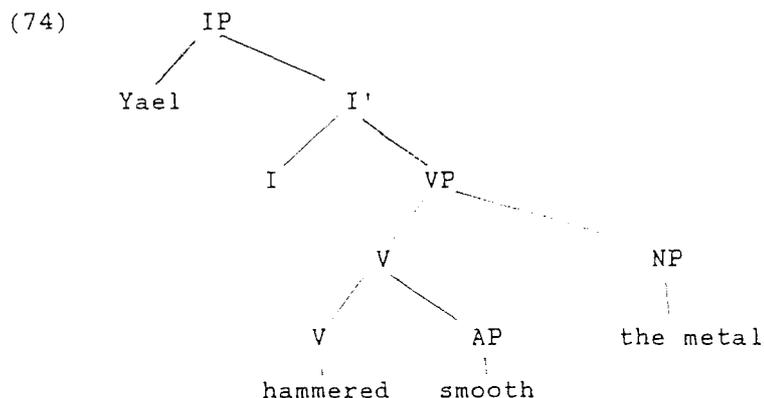
#### 3.3.1. Resultative SPs in DPs

As for the resultative SPs, it must be noted that they can represent a counterexample to the generalization in (68) if considered as adjunct predicates. In fact, the example (67b), repeated here as (73), contains an individual-level predicate like *grande* (big), and then it should not be an adjunct:

- (73) La fabricación de los tornillos *demasiado grandes*  
 The making of the screws *too big*

Moreover, in section 3.1, we argued against the analysis of Spanish resultatives as subcategorized small clauses. Then, if it is neither an adjunct, nor a subcategorized small clause predicate, this seems to lead us to a sort of paradox.

To escape this situation, one possibility could be to adopt for DPs too Rapoport's analysis of English sentences containing resultatives, i.e., to treat them as structures involving a complex predicator formed by the verb and the resultative AP. This complex predicator  $\theta$ -marks the object in a configuration such as the one in (74), taken from Rapoport (1990:46):



Within this approach the NP *the metal* still is an argument of the verb, while the AP *smooth* is not an adjunct, being thematically selected by the verb to form the complex predicator. In this way, a solution could be obtained without recourse to the concept of subcategorized small clause, or consideration of the AP as an adjunct. Further support for this idea comes from the fact that the formation of complex predicates is clearly visible in German, as pointed out by G. Brugger (personal communication), and the same is true for Dutch:

- (75) a. Das flachhammern des Metalles (German)  
 b. Het plathameren van het metaal (Dutch)  
 The flat-hammering of the metal
- (76) a. Das rotstreichen des Hauses (German)  
 b. Het roodverven van het huis (Dutch)  
 The red-painting of the house

A second possibility can be adapted from Demonte's (1990) analysis of Spanish resultative constructions in sentences. She assumes that resultatives develop the eventive structure of the verb, and, like arguments, they are somehow linked by the verbal head without being selected as small clauses.

Both analyses provide a solution for the problem raised by the occurrence of individual-level resultative predicates in DPs. On one hand, resultatives appear not to be adjuncts, so they do not fall under the generalization in (70); on the other hand, they are not canonical subcategorized small clause structures, so they are allowed to occur in DPs without violating case or government requirements, because the object DP would be  $\theta$ -marked, and hence case-marked, by the head noun. In any case, the proposals in Rapoport (1990) and Demonte (1990) suggest that there are independently motivated reasons to consider some resultatives neither as adjuncts, nor as subcategorized small clauses. If so, the generalizations suggested in the previous sections can be maintained.

### 3.3.2. Individual-Level Depictives

Consider now the following example:

- (77)  $Lo_i$  encontré *blanco*<sub>*i*</sub>  
It/him (I)-found *white*

In Spanish, (77) is ambiguous: there are two possible readings, associated with the distinction between individual-level and stage-level predicates, which can be paraphrased as in (78):

- (78) a. Encontré uno que era blanco / El que encontré  
era blanco  
(I)-found one which was white / The one (I)-  
found was white  
b. Cuando lo encontré, estaba blanco  
When it/him (I)-found, it/he was white

*Blanco* (white) denotes a permanent property in the first reading, and in the paraphrase the copula *ser* ("permanent" to be) must be used. In the second reading a transitory property is ascribed to the object of *encontrar*, and the copula is this time a form of *estar* ("transitory" to be): imagine a situation in which someone finds/meets a person whose face has become white after a great shock.

As mentioned above, individual-level predicates can appear as SPs with verbs like *comprar* (to buy), *encontrar* (to find), *dar* (to give) or *elegir* (to choose). Obviously, they cannot receive the same temporary interpretation of stage-level adjuncts; rather they select a subset from the set of objects denoted by the head noun of the DP: for example, suppose that in (71) --with the interpretation in (78a)-- we are speaking about a dog; then, the depictive adjunct *blanco* indicates that within the set of dogs, an individual belonging to the subset of white dogs has been picked up.

The ungrammaticality of the examples in (72), repeated here as (79), shows that this interpretation is not available in English:

- (79) a. \*Ayala bought the dog *intelligent*  
b. \*Ayala cut the bread *white*

In Spanish this interpretation is possible only with verbs which somehow imply the delimitation of subsets. In fact, the counterpart of (79a) with *comprar* (to buy) is grammatical, but the counterpart of (79b) with *cortar* (to cut) is not, as shown in (80):

- (80) a. Ayala compró el perro *inteligente*  
 b. \*Ayala cortó el pan *blanco*

Do these facts represent a counterexample to the generalization in (70) about adjunct predicates in DPs? They do not. Interestingly enough, individual-level depictive SPs are never found in DPs; consider the following examples, built on the above mentioned verbs (they only get the interpretation in which the adjective acts as an internal modifier):

- (81) a. \*La compra del perro *inteligente*  
 The purchase of-the dog *intelligent*  
 b. \*El hallazgo del perro *blanco*<sup>11</sup>  
 The finding of-the dog *white*

The situation can then be described as follows: there are individual-level depictives in sentences, but not in DPs. The same is found with verbs like *buscar* (to search), *necesitar* (to need) or *querer* (to want), the traditional opacity-inducing verbs; in these cases, it can be maintained that they select small clauses as their complements, as pointed out by V. Demonte (personal communication). This provides a natural explanation both for the occurrence of individual-level predicates and for the ill-formedness of examples like the following, as said in section 3.1.:

- (82) a. \*La búsqueda del perro *inteligente*  
 The search of-the dog *intelligent*  
 b. \*La necesidad del perro *inteligente*  
 The need of-the dog *intelligent*  
 c. \*El deseo del perro *inteligente*  
 The desire of-the dog *intelligent*

*Comprar*, *dar* or *encontrar* are not opacity-inducing verbs, but their effects on secondary predication could be related to the properties of intensional verbs in the following way: they only allow individual-level SPs when their object is not referential (i.e., when it is non-specific or denotes a type, rather than a token). This is possible if an opaque context is evoked (a desire, a need, an intention or a search). A clearly referential DP forces a stage-level interpretation of the SP, while a non-referential DP permits an individual-level reading too, as with real intensional verbs; consider the contrast in (83):

- (83) a. Me compré el traje *azul*  
 To-me<sub>cl</sub> (I-)bought the suit *blue*  
 b. Me compré este traje *azul*  
 To-me<sub>cl</sub> (I-)bought this suit *blue*

In the first example, *el traje* can be understood as non-referential (for instance, if one thinks of a previous

desire or search for a suit): in this case the SP can be given an individual-level or a stage-level reading (as with real intensional verbs). In the second example, the presence of the demonstrative *este* forces a referential interpretation of the object and thus a stage-level reading of the SP. Some verbs, then, allow individual-level SPs when they can be related to opaque contexts in some way. However, this could not be a good reason to consider them as verbs subcategorizing small clauses. Since there is no evident way to extend the subcategorized small clause analysis to verbs such as *comprar*, a different explanation should be offered, perhaps based on some property of opaque contexts. We will not go into this issue here.

#### 4. CONDITIONS ON SECONDARY PREDICATION

The issue we will address in this section is the existence of the same general restrictions on SPs in sentences and DPs. The conclusion we arrived at in section 2 (i.e., only LCS complements of a nominal head can be subject of a SP), can in fact be considered as part of a general principle governing secondary predication: the subject of a SP must be a  $\theta$ -marked argument of the lexical head in whose domain the SP occurs.

A second general restriction, defended in several studies on secondary predication, is a configurational one:

(84) A predicate mutually m-commands its subject<sup>13</sup>.

As it is stated in (84), the condition implies that a predicate and its subject must belong to the same maximal projection. As Nakajima (1990) says, the notion of m-command is also crucial to the assignment of  $\theta$ -roles. Then, it means that  $\theta$ -assignment both by a head to its arguments, and by a SP to its subject, is performed under mutual m-command.

In the case of DPs, the configurational condition always holds in an evident way, assuming that the complements  $\theta$ -marked by a nominal head are introduced by prepositions that are inserted as case-markers and do not head a maximal projection. In examples like

(85) La llegada de Ernesto<sub>i</sub> *cansado*<sub>i</sub>  
The arrival of Ernesto *tired*

*Ernesto* is not preceded by a "true" preposition, hence, it is not included in a PP and the predication coindexing between *Ernesto* and *cansado* does not violate the condition of m-command.

However, there is one case in which the condition seems to fail: it is the case of "agentive" phrases introduced by *por parte de* (by-phrases)<sup>14</sup>:

(86) a. La destrucción de los muebles por parte de  
Juan<sub>i</sub> *encolerizado*<sub>i</sub>

- The destruction of the furniture by Juan  
*enraged*
- b. La detención del delincuente por parte de  
María, *disfrazada, de camarera*  
The arrest of the delinquent by María *dressed*  
*of (=as a) waitress*

Spanish speakers give very controversial judgements about DPs like the ones in (86). This suggests that there are different principles operating in each case. For those who do not accept such constructions, the condition of m-command is the crucial one; those who accept them seem to put in the first place the condition of thematic domains.

Notwithstanding, a more developed explanation for the occurrence of SPs related to "by-phrases" could be given along the following lines. Suppose we consider (86) as well-formed structures. Even if *por parte de* is a true preposition introducing an adjunct PP, "by-phrases" are closely related to argument structure: Grimshaw (1990), for instance, has suggested to consider them as *argument adjuncts*. Then, one can view the "by-phrase" as an adjunct linked to an agentive implicit argument, in a sort of reduplication relationship. Since we have shown (section 2.2) that implicit arguments could be subjects of SPs, it seems reasonable to suggest that the implicit argument (a  $\theta$ -marked element) is the real subject of the SP. In this case, both the thematic and the configurational conditions would apply.

In section 3, we discussed other conditions on secondary predication which could be considered as general restrictions applying to sentences as well as to DPs.

First, we claimed that subcategorized small clauses cannot appear in nominals and, hence, individual-level predicates of the kind selected by verbs as *to consider* or *to declare* are impossible too. This fact constitutes a clear difference between sentences and DPs, as small clauses are perfectly possible when selected by verbs in sentences. However, it is not a failure of some general condition on secondary predication, but rather an effect of the independently motivated differences between nouns and verbs concerning government and case-marking. Then, in this case, it is not necessary to establish separate conditions on SPs for sentences and DPs.

Secondly, we stated that only stage-level predicates can be adjunct SPs in DPs. The same thing has been noticed for sentences. Some authors have tried to explain the phenomenon by assuming Kratzer's idea that stage-level predicates contain an  $\langle e \rangle$  position in their argument structure. According to this, only stage-level predicates can appear in adjunct constructions, because they are the only ones to have an  $\langle e \rangle$  position available for linking with the corresponding  $\langle e \rangle$  position of the main predicate (the verb); consequently, only a stage-level predicate can be licensed by means of a connection between the two  $\langle e \rangle$  places. On the contrary, individual-level adjuncts have no such  $\langle e \rangle$  position, and therefore there is nothing to connect them with the main predicate; as a result, they are not licensed. However, there is a problem for the extension of this approach to Spanish sentences. As we saw, certain

verbs can accept individual-level adjuncts which need to be interpreted in a specific way. Why these verbs give rise to such an exception in sentences, but not in DPs, still remains a mystery.

To sum up, the distribution of SPs is governed by the same conditions in sentences and DPs: the structural condition on m-command, the thematic condition on LCS complements, the "aspectual" condition on agent-oriented SPs and events, and the semantic (stage-level) restriction on adjunctpredicates. The last one, which seems to hold for DPs, fails to apply to sentences, at least in Spanish. This is the only real difference between sentences and DPs; other apparent differences are due to certain intervening factors, such as the restricted government properties of nouns or the identification of a LCS-complement with R in many result nouns. In short, the number of common conditions is important enough to maintain, also with respect to secondary predication, the deep parallelism observed by many linguists between sentences and DPs as grammatical domains.

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## NOTES

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1. We will use mostly Spanish data, with a word-by-word English translation.

2. See Williams (1980) and (1983), Rothstein (1983) and Napoli (1989).

3. See for example Chomsky (1981) and Stowell (1983).

4. Very little attention has been paid to this phenomenon, either in studies about predication, or in studies about the internal structure of DPs. To the best of our knowledge, only in some recent work on argument structure (Safir (1986), (1987) and (1988); Grimshaw (1986) and (1990); Roeper (1987); and Napoli (1989)), a tangential discussion of SPs in DPs has arisen. Some authors have even denied their existence (Williams (1982) for English, and Hernanz (1988) for Spanish. However, M.L. Hernanz (personal communication) no longer maintains her former position).

5. For instance, Hernanz (1988) and Rapoport (1990).

6. Safir (1987) suggests a similar principle, the "Adjunct Restriction", which establishes a relationship between the eventive nature of the head noun and the possibility of adjunct-modify an English prenominal genitive NP.

7. Among the tests used to distinguish the event/process reading from the result reading, the following can be mentioned: only result nouns can appear in plural, with determiners other than *the* (i.e., demonstratives *this*, *that*, or indefinite *a(n)*), and can have postnominal modifiers like *of John's*.

8. As for internal structure of DPs, we broadly assume the distinctions between *subject of NP* and *object of NP* first introduced in Cinque (1980), and developed in Giorgi & Longobardi (1991), among others.

9. In standard Spanish, "by-phrases" are introduced by *por parte de* in nominals, and by *por* in sentences.

10. We follow Giorgi & Longobardi (1991) and many earlier accounts in considering the preposition as a case-marker, instead of the head of a true PP.

11. Actually, it is not always possible to have the internal argument as a possessive even when the external argument is not lexically present:

- i) ?Hablando de Skinner, su<sub>1,111</sub> crítica...  
As for Skinner, his criticism...
- ii) ?Hablando de Julio Iglesias, su<sub>1,111</sub> imitación...  
As for Julio Iglesias, his imitation...

See Escandell-Vidal (1991) for a discussion of this issue.

12. Some speakers, and for a small subset of nouns, accept easily the event reading, even with the "active" structure; in these cases the DP itself is still syntactically ambiguous, but the condition on the non-possessivization of the internal argument seems to hold:

- i) La descripción de Juan<sub>1,1</sub>, de María<sub>1,1</sub>  
The description of Juan of María
- ii) Su<sub>1,1</sub>, descripción de María<sub>1,1</sub>  
His description of María
- iii) \*Su<sub>1,1</sub>, descripción de Juan<sub>1,1</sub>,  
Her description of Juan

13. Picallo (1991) presents the following arguments:

- a) only ergative "subjects" may appear as bare plurals;
- b) agent nominalizations are only possible with intransitives;
- c) so-called referential adjectives can only "substitute" external arguments: they are, then, impossible with ergative nominalizations.

14. For some speakers, a predicative reading for the AP *nerviosos* is impossible, while it seems perfectly acceptable for others. We will discuss the problem of "by-phrases" as subjects of predication in section 4.

15. We use the term *implicit argument* in a theory-neutral way, without committing ourselves to any proposal concerning their syntactic status. For further discussion, see Williams (1985), Roeper (1987), Safir (1987), and Giorgi & Longobardi (1991), among others.

16. For clarity's sake, we will use the standard notation for empty categories to represent implicit arguments. Conventionally, agent implicit arguments will appear in the prenominal position, while theme implicit arguments will be in the postnominal position.

17. In this example, the predicative AP shows masculine and singular agreement features, which are the default values for arbitrary elements in Spanish. In Italian, the corresponding default features are masculine and plural. As expected, the Italian translation of this example adopts these features for arbitrary interpretation:

- i) La presentazione davanti al capitano *mal rasati*<sub>1,1,SC,PL</sub> è motivo di punizione

18. We use here the dislocated construction with an accusative clitic to show the predicative reading and avoid the possibility of understanding *barato* (cheap) as a restrictive modifier. C. Picallo (personal communication) has pointed out that the clitic system of Catalan makes the distinction even clearer. When the AP is a predicative and the direct object is cliticized, the SP can be represented by the special clitic *hi*, as in ii): if the AP, on the contrary, is a modifier, only the accusative clitic can appear, as in iii).

- i) Va comprar el vestit barat  
(She/he)-bought the dress cheap
- ii) L'hi va comprar  
It HI<sub>cl</sub> (she/he)-bought (SP reading)
- iii) El va comprar  
It (she/he)-bought (internal modifier reading)

19. We owe this example to I. Bosque.

20. In this example, the context imposes the interpretation of *cena* as a concrete object. If an eventive reading were forced, then the sentence would be well formed:

- i) Fue divertida la cena de Juan *en pijama*  
(It)-was funny the dinner of Juan *in pyjamas*

21. We owe to A.-M. Di Sciullo the suggestion that inalienable possession constructions involve a sort of diadic predicate which links the "possessor" and the "possessed" element.

22. In Napoli (1989: 163) a similar constraint is stated:  
"If a secondary predicate is within the theta-domain of a lexical item H, its subject role player must appear in the lexical structure of H."

In her theory, it is still valid for DPs, since nominal heads act as primary predicates (See her examples in pp. 104-105). However, we depart from her assumptions in two essential points: we do not consider "as-phrases" as typical examples of SPs, as she does; and we use the term *event* in a more restricted way, following Grimshaw (1990).

23. See Chomsky (1970), Higginbotham (1985), Safir (1986) and (1987), Zubizarreta (1987), and Grimshaw (1990), among others.

24. We are adopting here a proposal by G. Cinque and G. Longobardi for certain similar constructions.

25. It should be added that all the examples of SPs in DPs we have seen up to now demonstrate that there can be predication relations inside DPs, and that these are compatible with the requirements of Williams' theory of predication: predicates must be maximal projections which need to be saturated.

26. On the distinction between resultatives and depictives in Spanish, see Demonte (1988) and (1990). For English resultatives, see Hoekstra (1988).

27. Notice that this restriction is not derived from a more general prohibition against the use of DPs as predicates. In fact, DPs can be predicates in copular structures, as in i), or in subcategorized small clauses, as in ii):

- i) Juan es su marido  
John is her husband
- ii) Te creía su marido  
You<sub>CL</sub> (I)-believe her husband

28. The strategy to avoid ungrammatical results consists in the insertion of the preposition *como* (the equivalent to English *as*) before the predicate of the small clause, especially if it is a nominal predicate. The same seems to be true for English:

- i) Her election \*(as) a treasurer

Emonds (1984) suggests that "non-comparative *as*" is in these cases the prepositional counterpart of a copular verb, and is followed by a predicate DP:

- ii) John as Hamlet would be a poor choice

It is still unclear how the insertion of *como* makes Case available for the subject DP; we can just say that it permits to circumvent the restriction on DP predicates, changing their categorial status to PPs.

However, the complement of elective verbs, like *elegir* and *nombrar*, has different properties in Spanish:

- iii) La elección de Pérez (diputado)  
The election of Pérez (deputy)
- iv) El nombramiento de Pérez (alcalde)  
The nomination of Pérez (major)

This suggests perhaps that a small clause analysis is not adequate for such verbs, and that bare NPs behave as adjectives.

29. The original distinction has been further developed by Diesing (1988) and Kratzer (1988).

30. Rothstein (1983) and Hernanz (1988) reach the same conclusion, but using different terms. Rothstein notes that adjunct predicates attribute a temporary property to the entity denoted by their subject DP. Hernanz uses aspectual features like [ $\pm$  perfective] instead of Carlson's distinction between stage-level and individual-level predicates, but she gives an explanation very similar to Rapoport's.

31. See the generalization in (68).

32. Besides the restrictive reading, the adjective *blanco* (white) can have a predicative reading, but only as a stage-level predicate, not as an individual-level one.

33. The condition is taken from Nakajima (1990:287). See also Demonte (1988).

34. Their status is still quite controversial. See Zubizarreta (1987), Zucchi (1988) and Grimshaw (1990) for different approaches. On predication and "by-phrases" in Spanish, see Demonte (1986).

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**The Anomaly of Copular Sentences**

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## **The anomaly of copular sentences (\*)**

### **1. The anomaly of copular sentences**

At a sufficient level of abstraction from empirical data, the following pair of sentences can be naturally associated:

- (1)a una foto del muro fu la causa della rivolta  
"a picture of the wall was the cause of the riot"
- b la causa della rivolta fu una foto del muro  
"the cause of the riot was a picture of the wall"

This intuition yields a quite unexpected departure from a general pattern. Simple cases like the following:

- (2)a una foto del muro precedette la causa della rivolta  
"a picture of the wall preceded the cause of the riot"
- b la causa della rivolta precedette una foto del muro  
"the cause of the riot preceded a picture of the wall"

indicate that generally if we permute the NPs in a clausal structure of the kind *NP V NP* we end up with a very different result: still maintaining the discussion at a pretheoretical level we can capture this difference by saying that (1a-b) can both be paraphrased by a single proposition like "a picture of the wall has the property of being the cause of the riot" while no single proposition can be a suitable candidate to paraphrase both (2a) and (2b). Although very restricted also within copular sentences, this phenomenon is an exclusive peculiarity of this kind of construct: henceforth, we will refer to it as to *the anomaly of copular sentences*.<sup>1</sup>

The aim of this paper is to implement such a phenomenon and explore some of the empirical and theoretical consequences which are related to it. Data will be taken mainly from Italian and compared in some crucial cases with English.

### **2. Against a naïve analysis: corresponding asymmetries at different levels**

In spite of their superficial similarity and their propositional synonymity we can provide evidence that the two structures in (1a-b) are very different and embody surprising properties.

#### **2.1. A'-movements**

A core cluster of phenomena distinguishing (1a) from (1b) results by testing the two structures with respect to the so called *A'-movement*. Theoretically, this label corresponds to at least two different kinds of phenomena, wh-movement and Quantifier Raising, which, apart from overt realisation of movement in a given language, can be conceptually unified as the structural correlates of the link between an operator and a variable.

Let's start with overt A'-movement, that is, wh-movement.

### 2.1.1. wh-movement

Following the heuristic strategy pioneered in the seminal work of Ruwet (1975), we can test wh-movement from preverbal and postverbal position. To avoid interference with movement of the verb to C° position occurring in matrix interrogatives (see Rizzi (1991)b) we will test embedded clauses:

- (3)a [quale foto del muro]<sub>i</sub> pensi che t<sub>i</sub> fu la causa della rivolta  
"which picture of the wall do you think (that) was the cause of the riot"  
b \* [quale foto del muro]<sub>i</sub> pensi che la causa della rivolta fu t<sub>i</sub>  
"which picture of the wall do you think (that) the cause of the riot was"

As (3a-b) indicates, a sharp and uncommon asymmetry is yielded: wh-movement of an NP from postverbal position is blocked as opposed to the case in which the same element is moved from preverbal position: why should the copula block wh-movement from the position where traces are canonically licensed?<sup>2</sup>

A first descriptive generalization assuming that postcopular position does not license wh-movement *tout court* is immediately falsified by the following contrast:

- (4)a [di quale rivolta]<sub>i</sub> pensi che una foto del muro fu [la causa t<sub>i</sub>]  
"which riot do you think that a picture of the wall was the cause of"  
b \* [di quale muro]<sub>i</sub> pensi che la causa della rivolta fu [una foto t<sub>i</sub>]  
"which wall do you think that the cause of the riot was a picture of"

We thus discover another asymmetry: licensing of wh-movement from the postverbal NP is not homogeneously restricted.

### 2.1.2. Quantifier Raising

We can parallel the analysis of wh-movement at the level where quantifiers reading is fully disambiguated. Consider the following pair, analogous to (1a-b):

- (5)a [ogni libro] fu [l'acquisto di [molti studenti]]  
"every book was many students' purchase"  
b [l'acquisto di [molti studenti]] fu [ogni libro]  
"many students' purchase was every book"

The first sentence is ambiguous: it can either mean that every book was such that many students purchased it or that many students are such that they purchased every book. The second sentence selects only the second reading as a suitable interpretation. Following common assumptions (see May (1986)), we can interpret the interaction among quantifiers by means of an operation of A'-movement which displaces quantifiers in an adjoined position at a certain level of abstraction from empirical data (i.e. LF, by definition): this process is formally labelled *Quantifier Raising* (QR). We will say that a certain quantifier can be in the "scope" of another only if the latter has at least the same c-domain as the former. This assumption allows us to interpret the intuition regarding the absence of the wide scope reading of postverbal quantifier in (5b) by saying that it cannot be moved to reach the scope of preverbal quantifier.

Also in this case, there is no simple explanation. In fact, (6) shows that we cannot just stipulate that QR is possible only from an *embedded* postcopular NP, as in (5a):

- (6)a una foto del muro non fu [la causa di [molte rivolte]]  
"a picture of the wall wasn't the cause of many riots"  
b la causa della rivolta non fu [una foto [di molti muri]]  
"the cause of the riot wasn't a picture of many walls"

The first sentence is ambiguous: it can either mean that a picture of the wall was the cause of not-many (i.e. few) riots or that many riots are such that a picture of the wall

was not the cause of them. Given our formal assumptions, this means that the quantifier embedded in the postverbal NP can respectively stay in situ or be raised to cross over the scope of negation. On the other hand, the second sentence can only mean that it is not the case that the cause of the riot was a picture of many walls, i.e. it can only have a sentential scope. Leaving aside the reason which exclude the interpretation where *not* melts with *many* yielding *few*,<sup>3</sup> it is crucial for us to notice that the wide scope reading of the quantifier in (6b) corresponding to a paraphrase like many walls are such that the cause of the riot wasn't a picture of them is not a suitable candidate: again, paralleling the paradigm we construed for testing wh-movement, we conclude that extraction of quantifiers from postverbal NP is not uniformly restricted.

## 2.2. Idiosyncrasies: *ne*, verbal agreement and *lo*.

Along with these corresponding asymmetries at different levels which could be quite easily detected also in English (as can be seen by examining the glosses), Italian syntax offers some idiosyncratic tests to support the asymmetry of (1a) vs. (1b) (for a more detailed account see Longobardi (1985) and Moro (1988), including a discussion concerning binding theory, among others).

It is well known that in Italian, under certain structural restrictions first arrived at by Cinque (1980) and successively elaborated by Giorgi-Longobardi (1991), the complement of a noun phrase can be extracted from an NP. For example, it can be cliticized over the verb which precedes it by means of the clitic *ne* (see Moro (forthcoming) and references cited there). Although both NPs, namely *la causa della rivolta* ("the cause of the riot") and *una foto del muro* ("a picture of the wall") are potentially compatible with such a phenomenon, again only one option is available:

- (7a) *una foto del muro ne<sub>i</sub> fu [la causa t<sub>j</sub> ]*  
 "a picture of the wall of-it was the cause"  
 b \* *la causa della rivolta ne<sub>i</sub> fu [una foto t<sub>j</sub> ]*  
 "the cause of the riot of-it was a picture"

Whatever permits *ne*-extraction from *la causa* does not work in the same way for *una foto*. Notice again that nothing "within" the NP prevents per se this operation: we are forced to the suspect conclusion that the copula is the only responsible for the ungrammaticality in (7b): how it can select the two cases is so far a mystery.

A second type of test differentiating (1a) from (1b) is particularly important since it allows cross-linguistic comparison with English data. The following contrast shows that verbal agreement is sensitive to the number of the NP headed by *foto* wherever its linear position is w.r.t. the copula:

- (8a) *le foto del muro furono/\*fu la causa della rivolta*  
 "the pictures of the wall were/was the cause of the riot"  
 b *la causa della rivolta furono/\*fu le foto del muro*  
 "the cause of the riot were/was the pictures of the wall"

This test yields opposite results in English where the copula agrees unselectively with preverbal NP: in section 3.2. we will provide an explanation of this phenomenon by tracing it back to its nearest theoretical correlate, i.e. the *pro*-drop parameter.

A third test relies on the possibility of cliticising a postverbal NP over the verb: this option is available only for the form corresponding to (1a):

- (9a) *le foto del muro lo<sub>i</sub> furono t<sub>j</sub>*  
 "the pictures of the wall *lo* were"  
 b \* *la causa della rivolta lo<sub>i</sub> furono t<sub>j</sub>*  
 "the cause of the riot *lo* were"

An important remark which would be helpful in implementing these asymmetries is that the only suitable clitic which can be used in copular sentence is *lo*, an invariant form

which never agrees in gender and number with the associated NP and is only homophonous to the accusative masculine singular clitic pronoun. In fact, the agreeing form *la*, feminine singular, which would be normally used to cliticise *la causa*, in (9a) would have produced a sharp ungrammatical result.

Both the core cluster of asymmetries we detected by testing A'-movements at different levels of representation and the one related to a set of language particular phenomena converge to the conclusion that (1a) and (1b) embody very different properties in spite of the intuitive similarity that *prima facie* the two sentences display both w.r.t. their surface structure (*NP V NP*) and their propositional content.

In the next section we will combine these two contrasting intuitions into a unified theory based on principles of Universal Grammar.

### 3. The raising of predicates: toward a unified theory

One of the constitutive requirement that must be fulfilled in our framework is that at a sufficient level of abstraction from empirical data, a certain thematic relation is to be implemented in a non-ambiguous way. This fundamental requirement can be met by postulating a level of representations where thematic relations are biuniquely mapped into "configurations". Each argument would then bear a certain  $\theta$ -role if and only if it stands in a certain position, interacting with morphological elements and organized within the general X-bar skeleton (according to various degrees of prominence to be empirically established; see Baker (1988)).

A very simple case might clarify the situation. Consider for example a pair of sentences like the following:

- (10a) frogs defeated rats  
b rats were defeated by frogs

In spite of the linear order in which the two NPs occur, our intuition would associate these two sentences with a unique thematic interpretation where frogs play the role of those who defeated while rats play that of those who were defeated. The theory of grammar must in principle be able to implement this intuition. One of the possibilities is to associate each thematic role to exactly one position w.r.t. the verbal head and stipulate that at a certain level of abstraction from empirical data *frogs* and *rats* occupy the same position in both cases:

- (11) [<sub>VP</sub> frogs<sub>+ $\theta$ 1</sub>] [<sub>V'</sub> [<sub>V $^{\circ}$</sub>  defeat] rats<sub>+ $\theta$ 2</sub>]]

The morphological elements which show up in (10a-b) would then interact to reach the correct phonological and logical representation according to certain constrained operations which we will leave undefined here.

Something similar occurs in our pair of copular sentences. On the one hand, in spite of the different linear order, the interpretation of the two sentences varies only minimally: in particular, the thematic relations are totally invariant. On the other, we know that the two sentences embody very different properties. We are consequently forced to postulate that the structure which underlies the pair in (1) must be the same for the two sentences and that it is the different organization of the lexical elements that contains sufficient information to explain the cluster of empirical asymmetries we exemplified in section 2.

Notice that the analogy between (10a-b) and (1a-b) is only partial: in the case of copular sentences a unified representation is even more compelling since the two sentences are not only bearing the same thematic interpretation but they do not even differ w.r.t. the morphological elements that build them. Again, if the different behaviour of (1a) vs. (1b) could not be traced back to a common structure at some point of the derivation, this would amount saying that the theory is not capable to understand this striking similarity.

### 3.1. Copular sentences as expanded small clauses

To construct the structure underlying (1a-b) we can rely on an independent fact. Let's shift for a moment to English and consider the following example:

(12) I consider [ $\alpha$  [a picture of the wall] [the cause of the riot]]

The complement of *consider* contains the same two NPs which constitute the two copular sentences: in fact, they also display the same thematic and predicational relation which links the two NPs in (1a-b). Leaving aside discussions concerning the nature of  $\alpha$ , we can follow Williams (1975) terminology and label this constituent *small clause*, emphasising its predicational nature.<sup>4</sup>

In fact, since at least Stowell (1978), copular sentences have been regarded as *expanded* small clauses as opposed to earlier approaches which regarded small clauses as *reduced* copular sentences. To meet the level of descriptive adequacy we will simply adopt the traditional terminology and call the NP which expresses the property of being the cause of the riot the "predicate" as opposed to the other one which will be labelled the "subject". We will assume that the small clause is the minimal constituent containing a predicative linking. Formally one can capture the structural conditions that a predicative linking must fulfill by adapting Rothstein's (1983) terminology. There are two different kinds of conditions that a subject and a predicate must meet: a *universal* condition imposing mutual m-command (see also Williams (1980)) and a *parametric* requirement fixing the order of predication in each specific language.

The structure underlying the pair of copular sentences in (1) will then be the following (NP<sup>1</sup> denotes the subject, NP<sup>2</sup> the predicate):

(13) [IP [NP e] copula [SC NP<sup>1</sup> NP<sup>2</sup> ]]

In order to make this representation feed the phonological level in the way that the sentences in (1) indicate, some further steps are required, that is either NP must appear in preverbal position. Within a modular approach to grammar this result can be obtained by appealing to independent reasons: here, it is case theory which justifies the further step. Notice first that the only case assigner available within this structure is the INFL<sup>o</sup> node "contained" in the copula and that this element assigns case under a specific structural condition, namely a spec-head relation.

It has been originally proposed in Moro (1988) that this relation can be fulfilled not only by the raising of the subject NP, as it is commonly assumed in the current framework, but, in certain cases like the one we are discussing here, also by *the raising of the predicative NP*.<sup>5</sup> Thus, the structure in (13) yields the two following options underlying respectively the sentence in (1a) and (1b):

(14)a [IP NP<sup>1</sup> copula [SC t NP<sup>2</sup>]]      (canonical (copular) sentences)  
       b [IP NP<sup>2</sup> copula [SC NP<sup>1</sup> t]]      (inverse (copular) sentences)

From a purely formal point of view, notice that these two options are entirely compatible with current conditions on licensing of traces. In particular we can assume ECP to be fulfilled in both cases: head government by the verbal head governing the SC and antecedent government by the chain headed in spec-IP. However, the advantages that this unified theory offers are far more relevant than the bare fact that the two sentences are generated by a unique underlying structure. The empirical content that (14) embodies will be evaluated by showing that it contains sufficient information to explain the entire cluster of asymmetries we discussed in previous sections without further assumptions.

The role of the copula here would be that of supporting (or more radically "spelling out") the morphological inflectional features which are normally realised on the predicate, in order to have a sentence, when the latter is realised by a verb. This view, which regards the copula essentially in the Aristotelian sense, implies non-trivial consequences for the theory of the clausal structure we will address in the final section.<sup>6</sup>

Before illustrating the peculiar properties that the structures in (14a-b) embody, notice that one of the immediate consequences of the raising analysis is that a necessary condition to license an inverse sentence is the presence of a landing site for the predicate to cross over the subject. This generalization straightforwardly explains the following English contrast:

- (15)a I consider [ a picture of the wall (to be) the cause of the riot ]  
b I consider [ the cause of the riot \*(to be) a picture of the wall ]

This contrast shows that if a landing site has not been provided by the structure then the predicative linking within the small clause must display its basic direction.<sup>7</sup> A potential alternative to the analysis in (14) would be to assume that the raising process involves a recursive CP. Although this approach would avoid some problem we will briefly address in this section, several empirical reasons immediately tell us that this cannot be the case. Notice first that the possibility of instantiating inverse sentences in infinitival constructs of the kind indicated in (15b) where no CP can be selected by *consider* would be totally exceptional. However, the major argument for assuming that the landing site for either NP is (not higher than) IP would clearly follow by the definition of "INFL" itself, once we analyse the following contrast:

- (16)a the cause of the riot is these pictures of the wall  
b these pictures of the wall are the cause of the riot

A part from cross-linguistic variations (which we will discuss in the next subsection) the pair in (16) shows that when the subject's and the predicate's  $\phi$ -features mismatch, the copula agrees unselectively with preverbal NP.<sup>8</sup> This means that the morphological features contained in each NP are triggering under spec-head relation the verbal agreement features which by definition we consider to be instantiating the INFL<sup>o</sup> node.<sup>9</sup>

Once we adopt the structure in (14b) together with the common one in (14a) several intricate questions come to mind; let's briefly address some of them.

A first problem is related to the *notion of case*. It has been proposed (see Chomsky (1986)a for discussion and references) that case assignment is not an independent condition but rather a derivative phenomenon, namely a requirement that (chains of) NPs must fulfill in order to be visible to  $\theta$ -assignment: at some level of representation there would be a one-to-one correspondence relating each (chain of) NP to a unique case. This geometrical situation is destroyed on empirical grounds once predicative NPs come into the arena. If (14b) is correct, they yield a twofold exception to this criterion of visibility to  $\theta$ -assignment: first, they are assigned case even if by definition they do not bear a  $\theta$ -role; second, they can share the same case with another NP, that is with the subject. Notice that these two assumptions are not just theory internal consequences of our theory of copular sentences.

Once we take into account languages provided with overt case like, for example, Latin or Ancient Greek, the assumption of a "case agreement" between the subject and the predicate can be empirically detected. Consider the following Latin cases:

- (17)a Caesar dux/\*ducem est  
(Caesar-nom leader-nom/\*-acc is)  
"Caesar is the leader"  
b senatores dicunt Caesarem ducem/\*dux esse  
(senators-nom said Caesar-acc leader-acc/\*-nom to-be)  
"the senators say Caesar is the leader"  
c Caesar dicitur dux/\*ducem esse  
(Caesar-nom is-said leader-nom/\*-acc to-be)  
"Caesar is said to be the leader"

This paradigm shows that morphological case is entirely compatible (indeed obligatory) with a predicative NP and that in this language it must be the same case as its subject (for Italian, see 3.2. in this paper).

Nevertheless (14b) contains a stronger statement: it says that not only can case be *shared* by the predicative and the subject NP but that it can be *assigned* to the predicative NP. To support this, consider the well known phenomenon of *for*-insertion in English infinitival copular sentences:

- (18)a [\**(for)* a picture of the wall to be t the cause of the riot] is unusual  
b [\**(for)* the cause of the riot to be a picture of the wall t] is unusual

Traditionally, one would analyse (18a) by assuming that since the infinitival copula cannot assign nominative case (neither, of course, accusative), the only way to fulfill case assignment is to insert the element *for* which would assign accusative under government. Reasonably, whatever we say for (18a) must be said for (18b): this forces us to exclude visibility to  $\theta$ -assignment as the immediate reason which justifies the obligatoriness of *for*.

There are at least two options to consider in order to solve this puzzling situation which we will briefly indicate here. One possibility essentially preserving the idea that case assignment is a condition for visibility to  $\theta$ -assignment is to say that case is assigned to chains of referential NPs (in the sense of Higgins (1973) following Geach (1962)) and that the predicative NP is part of the same chain of the subject.

An alternative possibility suggests itself here as a more radical departure from current assumptions on case assignment. By maintaining the discussion at an informal level, the guiding idea would be that case is not something that an NP requires per se but rather something that indicates that a certain *complex head* (incorporating agreement features) has been activated. Obligatoriness of case assignment would still be a derived phenomenon as in the traditional approach, with the major difference that here it would be a reflex of a general (morphological) principle requiring for agreement to be checked at some level of derivation rather than a condition on visibility to  $\theta$ -assignment.

Leaving intricated questions aside concerning the distribution of agreement heads (see Chomsky (1988)), let's focus on the case of copular sentences. If this approach to case theory proves tenable, it would be much easier to understand their anomalous status. Notice that within the alternative approach, the role that NPs play in case theory would be only an indirect one, due to the fact that they are the only elements which can activate this type of head under a spec-head relation. (cfr.  $*/_{IP} AP_i I^{\circ}_i \dots$ ). Now, in a copular sentence there is only one head containing agreement features to be checked, namely,  $I^{\circ}$ : then, to fulfill case theory it would be sufficient that one of the two NPs be raised to activate its spec-position. What happens to the NP which remains in situ? Since there are no other heads to be activated, it might either display no case at all (like *John* in *the cause of the riot is John*) or show a default or "null" case (like *him* in *the cause of the riot is him*) depending on the morphological idiosyncrasies of each type of NP. As we have seen in the case of Latin, it is also possible that Universal Grammar allows the default case to be realised by "agreement" with the other NP.

Although the line of reasoning should be rather clear, to adopt this alternative proposal a much more detailed discussion is required than the one just sketched here (for example the case in (18) would not be immediately clear). Nevertheless, since for our present purpose either option does not seem to have immediate empirical consequences we can leave the choice between the two possible approaches entirely free.

The very presence of a predicative NP in spec-IP is also problematic for other conceptually distinct reasons. In fact, it is not immediately compatible with the current assumptions concerning both the "logical" role of this position and more generally with the way in which different types of positions should be identified. Let's briefly address the question here.

The first problem relates to the issue the *extended part of the projection principle* is about. The presence of a predicate in spec-IP is incompatible with the idea that such a position is obligatory in every language (at least at LF; see Chomsky (1981): 88) as a device for providing the syntactic function expressed by the predicate with a subject to

"saturate" it in the fregean sense (see Rothstein (1983)). If our theory of copular sentences is correct, this position can also be realised by a predicative nominal and the plausible candidate for this type of saturation should rather be considered the position of the subject of a small clause (see Moro (to appear) for a more detailed discussion).<sup>10</sup> The obligatory realization of spec-IP in English can nevertheless be explained by appealing the necessity for the morphological elements contained in INFL° node to be activated.

The second problem concerns a different but not unrelated issue. Grammar distinguishes two basic kinds of positions: *argument positions* (A-positions) and *operator positions* (A'-positions), the prototypical case being that of a trace in one of the argumental positions within IP linked by a wh-operator in spec-CP. In general, an operator would be inherently incompatible with A-positions because in such a position a grammatical function is assigned (like subject, direct object etc.) and operators by definition range over them, they do not realize them. The possibility for a subject to occur in complementary distribution with a predicate in the same position determines an anomalous *intermediate situation*: in fact, we are forced to conclude that there is a position where a grammatical function is not determined but operators are still banned. Since any attempt to reformulate this fundamental distinction would take us too far we can simply stipulate that spec-IP is not accessible to operators, perhaps for morphological restrictions, without any other further assumptions than those currently adopted for such a position (see Rizzi (1991)b for a discussion on this matter).

Leaving these intricated questions aside we can approach our major task we addressed in section 2., namely that of deriving the asymmetries embodied in the structure of canonical and inverse sentences without any further information.

### 3.2. *pro* as a null predicate

One of the immediate advantages that the occurrence of predicates in spec-IP has concerns the analysis of the following case:

- (19) *pro* sono io  
       (*pro* am I)  
       'It's me"

What is the structure of this sentence? The first mechanical option that comes to mind is that we are facing a familiar case like the one in *pro telefona Gianni* (*pro* telephones Gianni): that is to say (19) is a typical case of rightward movement of the subject from preverbal position in Italian as in *Gianni telefona*. In spite of the appealing character of its simplicity, this solution is not plausible: by no means can a sentence like the one in (19) be derived from a sentence like \**io sono* which is meaningless.

To draw the correct structure for (19) we must crucially appeal to our theory of copular sentences. This theory says that the copula is not per se a predicate but rather the morphological realization (or support) of the inflectional features a sentence needs to be complete: this implies that in order to have a proposition the copula must in principle be "parasitic" to an independent predicative linking. If we apply this assumption to (19) this means that *pro* is either playing the role of the subject or that of the predicate. In other words, (19) can be either a canonical or an inverse sentence in the sense we defined it in (14). To decide which is which, we simply have to rely on the whole set of tests distinguishing the two types of constructs we showed in section 2. A quite straightforward diagnostic can be provided by means of *lo*-cliticization: remember that the prediction we make is that if a postcopular NP can be cliticised (by the invariant element *lo*), that NP is the predicate. If we apply this to (19) we yield a sentence like *lo sono*: although the result is perfectly grammatical, in no sense can it be associated with (19), because it means something like "I am so". The inevitable conclusion is that (19) is an instance of an inverse sentence, embodying the following structure:

- (20) [<sub>IP</sub> *pro*<sup>2</sup> sono [<sub>SC</sub> io t<sup>2</sup> ]]

The rather surprising conclusion that *pro* can play the role of a *null predicate*, in addition to the canonical use as *null subject*, is to be regarded as one of the facets of a general, perhaps surprising, phenomenon which makes NPs suitable candidates for both the role of subject and that of predicate. Of course, all licensing conditions to be fulfilled by *pro* remain the same, they being linked to the setting of a parametrical value and to the local environment where it occurs. Moreover, (20) indicates that (nominative) case, assigned by the finite tense morphology to spec-IP, can show up within the embedded small clause, yielding *io*: we can interpret this phenomenon by assuming that the lower NP agrees in case with the higher NP as one of the possibilities that Universal Grammar offers for the realisation of default case.<sup>11</sup>

The structure in (20) suggests a way to explain the phenomenon of rightward agreement with the copula in Italian syntax as exemplified in (8): recall that a preliminary desideratum of any explanation for such a phenomenon would be to for it to crucially rely on the pro-drop parameter, since its positive setting correlates with this in a direct fashion. As a first approximation, a sentence like (21a) can now be assigned the structure in (21b):

- (21)a la causa della rivolta sono/\*è io  
 (the cause of the riot am/is I)  
 "the cause of the riot is me"  
 b [<sub>α</sub> la causa della rivolta [IP pro<sup>2</sup> sono [SC io t<sup>2</sup> ]]]

This structure now embodies the fundamental property of the corresponding sentence, i.e. spec-IP is occupied by a predicative NP, and it accounts for the fact that the copula agrees with the lower subject, paralleling the independent case in (20). Nevertheless it is not complete yet: where is the element *la causa della rivolta*? Why can't it be in spec-IP triggering verbal morphology? We can tentatively approach the issue by answering separately to the two questions. Let's see first what  $\alpha$  is. A relevant test is offered by Aux-to-Comp constructions: if the phrase *la causa della rivolta* appears in postverbal position when the copula is raised to C°, then we can consistently assume that it is in an adjoined position to IP, avoiding any suspect appeal to CP-recursion. This is in fact the case:

- (22) [CP essendo<sub>j</sub> [IP la causa della rivolta [IP pro<sup>2</sup> t<sub>j</sub> [SC io t<sup>2</sup>]]]] ...

Then, the residual question is left why can't *la causa della rivolta* be directly raised to spec-IP. It seems to me that the current theory does not offer any immediate explanation to this empirical fact. Without developing in details this matter here, the line of reasoning for a tentative account can be drawn in the following way: suppose first that we adopt a strong version of the pro-drop parameter, that is if in a certain language *pro* can be licensed by verbal morphology, then it must be licensed. Moreover, suppose also that  $\phi$ -features of *pro* can be related only to referential NPs. If we combine these two assumptions, the agreement pattern in Italian would follow. The element *pro* turns out to be the result of the intersection of two different factors: on the one hand, from a morphological point of view, it contains the  $\phi$ -features of the referential subject *io*, on the other, from a logical point of view, it is structurally related to the position where predicates are generated within the small clause.

Notice that the plausibility of the two assumptions we just formulated can be founded on independent considerations.

The idea that *pro* is always licensed when it can be licensed fits in with the requirement of learnability underlying the theory of grammar: once the parameter is positively set, it seems not unreasonable to assume that the child would adopt the simplest hypothesis, namely that *pro* is always present, when the proper morphology is activated. Of course this assumption would be irrelevant for all cases where the subject is preverbal, as in [IP Gianni [IP *pro* telefona]], nevertheless, as (21) shows, it draws the only possible pattern when preverbal NP is not the subject.

On the other hand, the fact that *pro* can only inherit the  $\phi$ -features of the referential subject would follow from the pronominal nature of this element: recall that in Italian, the

pronominal clitic form corresponding to a predicative NP can never display its own  $\phi$ -features, contrary to a general pattern where clitics carry the gender and number of the NPs they are associated with. Since *pro* must contain some  $\phi$ -features by definition, the only option would be for it to pick up those of the subject.

A residual problem arises within this approach. If the role of preverbal NP in (23) is to specify the lexical content of *pro* in spec-IP, we must make sure that the same element can refer *only* to this. In other words, a part form focus or left dislocation, we must restrict the possibility for an NP to be adjoined to IP to only this construct to prevent "generalised" IP-adjunction. Independent evidence for a restriction on the range of elements that can be adjoined to IP comes from (23a-b), see also (ivb) in footnote (11):

- (23)a [IP *pro*<sup>1</sup> [lo<sup>2</sup> sono] [SC t<sup>1</sup> t<sup>2</sup>]]  
 b \* [IP *la causa della rivolta* [IP *pro*<sup>1</sup> [lo<sup>2</sup> sono] [SC t<sup>1</sup> t<sup>2</sup>]]]

In (23a) *pro* does not link the position of the predicate because otherwise *lo*-cliticization would be blocked, so we can specify its role by means of the number 1. Suppose we add the phrase *la causa della rivolta* to (23a) yielding (23b), analogous to (21b). The resulting sentence is ungrammatical: *la causa della rivolta* cannot refer to the subject because this is not compatible with the morphological features of the verb which shows first person singular. The only possibility to interpret this sentence would be for *la causa della rivolta* to specify the content of the overt pro-predicate *lo*: although in principle there is no reason to exclude this, the very fact that this link is blocked suggests that the restriction we are seeking for is indeed independently established. Leaving the formalization of such a condition aside, we might limit ourselves here to the factual observation that the NP which is adjoined to IP can only specify the lexical content of *pro* in spec-IP. This rules out (23b) but crucially it preserves the possibility to derive (21b).

If our theory is correct, then, the representation of an Italian inverse copular sentence would not differ from an English one in any relevant sense, modulo the pro-drop parameter, as we required in principle. We can now turn to the major task this paper is about, namely deriving the asymmetries of copular sentences from a principled framework without ad hoc assumptions.

### 3.3. ECP vs. Subjacency: focus on inverse sentences

In section 2. we showed that the subject of an inverse sentence cannot undergo A'-movement at all levels of representation. Focusing on the relevant segments, we are now able to assign the two following structures to (3b) and (5b) :

- (24)a \* *quale foto del muro pensi che* [IP *la causa della rivolta* [IP *pro*<sup>2</sup> fu [SC t<sup>1</sup> t<sup>2</sup>]]]  
 b \* *ogni libro* [IP *l'acquisto di molti studenti* [IP *pro*<sup>2</sup> fu [SC t<sup>1</sup> t<sup>2</sup>]]]

In the same section it has also been shown that extraction from an embedded subject yields ungrammatical results. We can assign to (4b) and (6b) the following structures:

- (25)a \* *di quale muro<sub>k</sub> pensi che* [IP *la causa della rivolta* [IP *pro*<sup>2</sup> fu [SC [NP una foto t<sub>k</sub>] t<sup>2</sup>]]]  
 b \* *molti muri<sub>k</sub>* [IP *la causa della rivolta* [IP *pro*<sup>2</sup> non fu [SC [NP una foto di t<sub>k</sub>] t<sup>2</sup>]]]

The two paradigms in (24)-(25) show us that the ungrammaticality is to be related to the violations of conditions on licensing of traces: the offending trace in (24) is *t*<sup>1</sup> while it is *t*<sub>k</sub> in (25). Before offering a formal system for deriving such violations, let's consider the situation from an abstract point of view.

Conceptually, Universal Grammar distinguishes (at least) two different sets of conditions for licensing a trace.

The *local environment* where a trace is generated must be sufficiently rich to ensure the recoverability of the empty category. Formally, it is assumed that a trace must be in a local relation with a head of a certain kind (prototypically, a "lexical head") and/or a trace must be identified by a local antecedent. This set of principles has been referred to in the literature as the *Empty Category Principle* (ECP) since Chomsky (1981), see p. 251. Leaving aside the important issue concerning the different "weight" that the two conditions have in capturing the range of empirical phenomena ECP is to cover, we can assume in first approximation a broad formulation where the two conditions are to be conjunctively fulfilled (see Rizzi (1990) for references, discussions and terminology):<sup>12</sup>

- (26) *t* must be:
- (i) governed by a *head* of a certain kind (formal licensing)
  - (ii) governed by an *antecedent* coindexed with it (identification)

Locality is embodied in the formulation of ECP via the notion of government which imposes two topological boundaries: an upper limit, the governor must m-command the governee, and a lower limit, the governee must m-command the governor. If there are no exceptions to the violation of the upper limit, apart from the possibility to reduce m-command to c-command as in Rizzi (1990), in certain contexts we leave undefined here the lower "barrier" can be transparent to the government relation, as in the case of IP.

Even if a trace fulfills ECP another set of conditions must be respected. A structure undergoes a "metrical" analysis checking the *maximal distance* at which a rule can be active on two elements, *X* and *Y*. This distance is measured in terms of maximal projections of a certain kind to which we will refer as "barriers" and the principle is usually called *Subjacency (Condition)* since Chomsky (1973). As a first approximation it is possible to formulate such a condition in the following way:

- (27) No rule can relate *X* and *Y* in the following structure:  
... *X* ... [ <sub>$\alpha$</sub>  [ <sub>$\beta$</sub>  ... *Y* ...  
where  $\alpha$  and  $\beta$  are barriers

In its first version, the notion of "barrier" was simply stipulated to include all and only cyclic nodes, i.e. noun phrases and clauses, with slight parametrical variations (see Rizzi (1982)). Although Subjacency is not necessarily related to traces, in a number of core cases *X* is a wh-element and *Y* is its trace: for example, (27) rules out extraction from preverbal NP across a (tensed) IP along with extraction from an NP or a CP which are immediately contained within an NP. Notice that Subjacency doesn't say that  $\alpha$  and  $\beta$  can per se interrupt any relation: it is the combination of the two that triggers ungrammaticality. If we consider the set over which  $\alpha$  and  $\beta$  range, that is the typical set of arguments, one can partially grasp the intuitive content of Subjacency as an empirical limit to the depth at which a trace can be embedded into arguments without becoming lost to syntactic operations.

If in the original formulation the notion of "barrier" which is involved in Subjacency and the one involved in ECP just corresponded to mere lists, recent works by Chomsky (1986)b and Cinque (1990) try to unify this notion by giving an intensional definition of a "barrier". Although the two proposals do differ significantly, they both converge to the assumption that, a good characterization of what counts as a barrier should rely in principle on some underlying property of the head which governs the potential barrier. Assuming that a head can govern the spec of its complement, we can reproduce the system of Chomsky (1986)b by defining a barrier as a maximal projection that either (i) fails to be governed in the canonical direction by a  $\theta$ -marking head (technically, that fails to be *L-marked*) and that is different from IP (inherent barrier) or that (ii) immediately dominates a non L-marked maximal projection (barrier by inheritance); on the other hand, following Cinque (1990), p.42, a barrier would be defined as a maximal projection that is not selected in a relevant way by a head non-distinct from [+V]: within this system, crossing just one barrier would induce a Subjacency violation.<sup>13</sup>

In fact, although there might be a certain degree of overlapping between ECP and Subjacency, due to the role of barriers, the conceptual distinction which justifies these two formal mechanisms is rather clear: ECP ensures the possibility for a certain empty category to be generated in a certain *position* while Subjacency barely registers a degrading of the level of grammaticality of a certain *link* of a chain.

Bearing this discussion in mind we can now approach the crucial examples and ask whether we are facing cases of ECP or Subjacency violation.<sup>14</sup>

Let's start from the paradigm in (25) considering the offending trace, i.e.  $t_k$ . This violation cannot be an ECP violation: it would be an easy task to show that if the same NP occurred as a direct object, the local environment would license a trace in such a position. Since locality requirements are satisfied, the only remaining possibility is for the violation to be a Subjacency violation. Intuitively, the violation which is produced when a chain crosses in a single step both NP and the small clause parallels the case when a chain crosses an NP in spec-IP and (a tensed) IP: in both cases we extract from a subject, passing through a clausal projection. The only difference is that a small clause is not projected by a head but since  $I^\circ$  does not affect the NP in any relevant sense (as far as Subjacency is concerned) we can disregard this difference.

Formally, one can implement this intuition by following Chomsky's (1986)b approach. Since the copula does not  $\theta$ -mark the NP contained within the small clause, as  $C^\circ$  does not  $\theta$ -mark the subject in IP, then this NP is not L-marked. This makes it count as a barrier and activate the mechanism of inheritance on the clausal structure. An analogous result would be obtained by applying Cinque's (1990) system.

A potential counterexample is now given by the fact that (3a) is well-formed and (5a) allows wide scope reading, i.e. extraction, of *molti* ("many") at LF: also in this case does the chain cross in a single step both an NP and the small clause. Why are these sentences good? Notice that there are no heads around we can appeal to in order to explain the fact that this NP does not count as a barrier. The puzzling situation can be better understood if we consider the nature of the NPs involved. In both cases they are predicates, not arguments. Since we are assuming Subjacency to be a restriction on extraction across arguments, the fact that this NP does not count as a barrier is not only consistent but in a sense it is predicted within this approach.

From a technical point of view, one can tentatively capture the data by extending the mechanism employed in Chomsky's (1986)a to implement the absence of barrierhood effect of VPs, namely we can assume that A'-movement, all other conditions being respected, undergoes adjunction to predicates at all levels:<sup>15</sup>

- (28)a di quale rivolta<sub>i</sub> pensi che una foto del muro fu [SC ... [NPT<sub>i</sub> [NP la causa t<sub>i</sub> ...  
 b molte rivolte<sub>i</sub> ... una foto del muro non fu [SC ... [NPT<sub>i</sub> [NP la causa di t<sub>i</sub> ...

A similar reasoning can be applied to *ne*-extraction to explain the asymmetry we detected in 2.2.. As for *lo*-cliticization it seems reasonable to assume that it is inherently incompatible with the projection of *pro* in spec-IP since it obliterates the  $\phi$ -features necessary to license such an element.

Let's consider now the violation in (24). In this case the offending trace is  $t^l$ . We claim that these violations are of different nature w.r.t. the previous ones, i.e. they are both instances of ECP violations.

On the one hand, the trace of the subject embedded in the small clause is not antecedent governed by the only possible candidate to perform such a role, i.e. *pro*, since this element rather antecedent governs its own trace, namely the trace of the predicate. If we assume a conjunctive formulation of ECP, the failure of antecedent government would per se imply a violation of ECP *tout court*.

On the other hand, it is plausible to assume that head government also fails by reasoning as follows. We know that the subject position within the small clause can be potentially head governed: in fact, in canonical sentences, this is the position where the chain of the subject originates. A preliminary question is what makes the copula a proper governor? Notice that this is not a trivial question: in all formulations of proper head government, a distinction must be stipulated within the class of heads. To qualify as a

proper governor it is not sufficient to be a head: weren't this the case, a complementiser would always be able to perform proper head government of a subject trace in a language like English giving the wrong prediction. In general, a first partition is made between *lexical vs. non-lexical heads*, where by "lexical" it is generally meant "able to assign a  $\theta$ -role". However, as it has been shown by Rizzi (1990), lexical heads are not the only one able to perform proper government: a second possible candidate is the agreement features contained in a head: this would account for the extraction of a subject across a null complementiser in English, it being the agreeing form of the complementiser in such a language. In the formulation of ECP we gave in (26(i)) the inclusion of this special kind of head within the set of proper governors is subsumed under the temporary label "head of a certain kind" (see also footnote (12)).

Since the copula could be scarcely regarded as a lexical element, without depriving the content of the word "lexical" of its technical value, it is reasonable to assume that the copula can play the role of proper governor only because it can support agreement features, paralleling what has been said by Rizzi (1990) to explain extraction of a subject across a null complementiser in English. If this is correct, then we have an immediate account for the impossibility of extracting a subject of an inverse sentence: since the agreement features would already been employed to license the chain of the predicate, no proper governor is available and the sentence is ruled out. In other words, a *uniqueness requirement* holds between a trace and the head which governs it by means of the agreement features it contains.

Leaving possible refinements aside, we can tentatively capture this requirement by assuming that for a head to properly govern a trace by means of the agreement features contained in it, the chain must pass through the spec position of this head, not an unreasonable assumption given that agreement is a process which involves a spec-head relation per se. Technically, we are led to refine the formal licensing condition of ECP we gave in (26(i)) in the following way (see also footnote (12)):

- (29) formal licensing: *t* must either
- (i) be governed by a *lexical* head or
  - (ii) activate the spec of a governing head containing *agreement*.

The ill-formed structures in (24) can now be explained as ECP violations both w.r.t. antecedent government and w.r.t. head government, with the important proviso that the copula satisfies formal licensing only in the sense of (29(ii)); in any case, they would be distinct from the cases in (25) as ECP violations vs. Subjacency violations.

The twofold aim of this paper is achieved: on the one hand, we provided a unified theory of copular sentences which derives the fundamental pair in (1) from a common underlying structure, i.e. (13); on the other, we proved that the core cluster of the asymmetries which differentiate the two superficially similar structures can be entirely derived by means of the information embodied in the two possible options permitted by (13), i.e. (14a-b), without further or ad hoc assumptions. In the next section, we will provide evidence for the claim that extraction from the subject of an inverse sentence violates a different principle w.r.t. the case where the whole subject is moved, namely Subjacency and not ECP.

#### **4. Violations of Subjacency condition**

The result of our analysis is that the subject of an inverse sentence is submitted to a twofold structural "tension". On the one hand, it cannot be moved as a whole because no head would properly govern its trace, given that the only potential candidate is already employed in licensing the trace of the predicate. On the other, no extraction can take place from it since it is embedded in a structural context which would trigger Subjacency violations.

The aim of this section is to provide evidence for the assumption that two different principles interact by showing that in a structure which varies minimally only one prin-

ciple is still violated. This asymmetry will be related to the selectional properties of a head according to the spirit which characterises the notion of Subjacency principle in its recent formulations. Formally, we will explore the role that  $X^\circ$  plays w.r.t.  $\beta$  in the following abstract schema:

(30) ...  $X^\circ$  [ $\alpha$ ]  $\beta$  ...

To pursue such a task, we must extend our theory of copular sentences to include those cases commonly regarded as "existential sentences".

#### 4.1. Extraction from embedded subject in *ci*-sentences

Since at least Milsark (1977) it has been argued that the raising of the subject to spec-IP in copular sentences is in a restricted complementary distribution with the occurrence of a dummy NP in the same structural position. This theory relied on the apparent similarity of pairs like the following:

- (31)a [IP [molte copie del libro]<sub>i</sub> erano [SC t<sub>i</sub> [nello studio]]]  
 "many copies of the book were in the studio"  
 b [IP pro<sub>i</sub> [*ci*'erano] [SC [molte copie del libro] [nello studio]]]  
 "there were many copies of the book in the studio"

The element *ci* (corresponding to English *there*, see Burzio (1986)) is considered a semantically null element, the so-called "expletive (realization of the grammatical function of subject of predication)", required by the extended part of the projection principle. We have already seen how copular sentences undermine this kind of approach by showing that subjects of predication are in a complementary distribution with predicates themselves in spec-IP, of course only if they are realised as NP. We can now try to see if our unified theory of copular sentences is of any importance to the issue concerning "expletives".

From a structural point of view, the postcopular NP of *ci*-sentences is in the same environment in which the subject of an inverse sentence is, i.e. it is immediately dominated by a small clause. Suppose we are right in assuming that *ci* is a mere dummy expletive holding the position of subject of predication, then a natural prediction is that extraction from the NP is blocked at all levels by Subjacency principle. This prediction fails to hold:

- (32)a [di quale libro]<sub>i</sub> credi che *ci* fossero [SC [NP molte copie t<sub>i</sub>] nello studio ]  
 "which book do you think there were many copies of in the studio"  
 b non c'erano [SC [NP copie di [molti libri] ] nello studio ]  
 "there weren't copies of many books in the studio"  
 c ce ne<sub>i</sub> sono [SC [NP molte copie t<sub>i</sub>] nello studio ]  
 "there of-it are many copies in the studio"

As the paradigm in (32) shows, extraction from the subject of the small clause yields perfectly grammatical results: both when overt movement is involved, as in wh-movement (32a) and *ne*-extraction (32b) and when abstract quantifier raising takes place (32c). In fact the last sentence can be paraphrased by "many books are such that there aren't copies of them in the studio" with the quantifier having scope over negation.

If we maintain the assumption that *ci* is a "dummy" element playing the role of the place holder of the subject, it would be very hard to see any conceptual reason for Subjacency to be inactivated. Furthermore, suppose that *ci* is a "scope marker" in the sense of Williams (1984), how can we interpret the possibility of wide scope reading of the embedded quantifier? At best, it would be a "selective scope marker".

To understand the paradigm in (32) we must then preliminarily make the theory of *ci* undergo a radical revision.

#### 4.2. *ci* as a raised predicate

Notice first that if we simply associate (31a) to (31b) a whole cluster of asymmetries remains unexplained:

- (33)a molte copie erano \*(nello studio)  
 "many copies were in the studio"  
 b c'erano molte copie (nello studio)  
 "there were many copies in the studio"
- c molte copie erano la causa della rivolta  
 "many copies were the cause of the riot"  
 d c'erano molte copie (\*la causa della rivolta)  
 "there were many copies the cause of the riot"
- e molte copie lo erano t  
 f \* ce lo erano t

The first pair indicates that PP cannot be omitted when *ci* is absent while it is fairly common to have well-formed structures of the kind in (33b) without the elements in parentheses. The second pair shows that when the subject is raised the postcopular NP cannot be omitted otherwise the sentence would lack a predicate, as a consequence of the fact that the copula is nothing but the support of morphological inflectional morphemes: on the other hand when the element *ci* is inserted, the presence of the same NP is not only superfluous but even ungrammatical. The third pair shows that the postcopular NP cannot be cliticised by *lo*, a normal option in the other construct. Why should an expletive of the subject position affect the structure in such a deep fashion?

Before interpreting these facts, let's briefly focus on the postcopular PP/AP which occur in these kinds of construct. The following asymmetries can be detected:

- (34)a perché sembra che molti italiani siano [in sciopero t ]  
 "why does it seem that many Italian are on strike"  
 b \* perché sembra che ci siano molti italiani [in sciopero t ]  
 "why does it seem that there are many Italian on strike"  
 c a chi sembra che molte persone siano [debitrici t ]  
 "to whom does it seem that many persons are indebted"  
 d \* a chi sembra che ci siano molte persone [debitrici t ]  
 "to whom does it seem that there are many persons indebted"  
 e due foto del muro sono su tre riviste ciascuna  
 "two pictures of the wall are on three magazines each"  
 f \* ci sono due foto del muro su tre riviste ciascuna  
 "there are two pictures of the wall on three magazines each"

What the paradigm in (34) indicates is the following: when the element *ci* is inserted, extraction from the postcopular PP/AP yields (weak) violations. This happens both with overt movement as indicated in (34a-d), and with Quantifier Raising (34e-f), given that a necessary condition to insert the distributional *ciascuna* ("each") is for the quantifier it is applied to to have scope over the other. Again, the question is why an expletive should change the situation?

Let's briefly summarize the analytical observations which are to be synthetically encoded in a structure representing a *ci*-sentence: first, when *ci* is present, the postcopular PP/AP can be deleted; second, when *ci* is present, the copula cannot be followed by two NPs; third, when *ci* is present, the PP/AP following the copula yields those typical violations due to extraction from adjuncts constituents (cfr. \**con chi hai incontrato Maria arrabbiata t* (\* with whom did you meet Mary angry)).

All in all, were we to maintain the analysis of *ci* as the expletive realisation of the subject of predication, it would be very hard to see how to account for these facts without assuming ad hoc restrictions. The specific proposal I want to make here is to synthesise

the situation by means of the two following abstract formulae replacing the ones underlying (31):

- (35)a [IP NP<sub>i</sub> copula [SC t<sub>i</sub> PP/AP]]  
 b [IP [IP pro [ci<sub>i</sub> copula] [SC NP t<sub>i</sub> ]] ... PP/AP]]

The structure in (35a) would not be different from the one usually assumed in current frameworks; on the contrary, the structure in (35b) is completely opposed to the traditional one. We have that *ci* is not the expletive realization of the *subject* of predication, or equivalently its "dummy" place holder, but it is rather the head of a chain linked with the position where *predicates* are generated within the small clause. In other words, *ci*-sentences are not exceptions to the two basic options admitted in (14), as predicted by our theory of copular sentences: they are rather instances of *inverse copular sentences*.<sup>16</sup>

The formulae in (35) derive all phenomena described in the paradigm in (32), (33) and (34): PP/AP are optional when *ci* is present because they are not predicates necessary to build a sentence but rather they are adjuncts. The copula cannot be followed by two NPs because for independent reasons NPs cannot play the role of adjuncts:<sup>17</sup> of course, when one of the two NPs is raised to precopular position, then the other can be interpreted, either as a predicate, if the raised one is the subject, or viceversa. Finally, *lo* is not a suitable candidate to cliticize the postcopular NP when *ci* is inserted because this NP plays the role of a subject, not that of the predicate and we independently know that cliticization of the subject in inverse sentences is banned.

#### 4.3. The "lexicalization" of the copula

This change of perspective concerning the role that the element *ci* plays in a copular sentence enables us to understand the violation of Subjacency in rather natural way. All other conditions being equal, what allows extraction from the embedded subject must in principle be related to the change of nature which the copula undergoes once *ci* is raised. Let's concentrate on the crucial structural fragments under investigation and, for the sake of simplicity, let's indicate the copula as the direct spell out of I°, rather than the V° support for such an element:



To better understand this process we might think of it as analogous to the process of incorporation of inflectional features within a verbal head (traditionally indicated as *V°-to-I°* movement; see Chomsky (1986)b: 70). The only difference is that when the predicate is *ci*, as opposed to V°, the inflectional elements are morphologically realised independently by means of the copular system.

Recall that under some updated version of Subjacency, the notion of "barrier" can be defined intensionally: a barrier is a maximal projection that fails to be governed by a head affecting it in some special way. We have already seen in section 3. that the copula is not able to perform such a special role: in fact, extraction from the subject of inverse sentences is impossible, paralleling the case of extraction from preverbal subject in tensed clauses.

If *ci* were a *dummy place holder*, as current frameworks assume, there would be no conceptual reason to expect it to change the relation between the complex head and the lower NP. Following Chomsky (1986)b, we would still expect the copula not to L-mark the lower NP and any extraction from it to trigger a Subjacency violation, the small clause being a barrier by inheritance. On the contrary, if we consider *ci* to originate in the predicative position within the small clause the situation is rather different: when *ci* is in-

corporated into I°, the new complex "molecule" will contain *the predicate* of the embedded subject.

From this point of view, the effect that *ci*-raising has on the copula is intuitively much more perspicuous: since the copula now incorporates the predicate of the lower NP, we can assume that a stronger relation is established between them solving the potential barrierhood status of the latter. However, although the theory of *ci* as a predicate does shed light on the rather unexpected asymmetries we just discovered, it seems to me that this process cannot be immediately implemented by using any of the current frameworks. In fact, on the one hand *ci* does not fit in with Chomsky's (1986)b approach, unless we stipulate that it assigns a  $\theta$ -role (but see footnote (10)); on the other, Cinque's (1990) generalization cannot be straightforwardly adopted either, unless we assume ad hoc that *ci* is non-distinct from [+V], the copula being irrelevant here.<sup>18</sup>

A more promising possibility to interpret the data is to rely on the *selectional properties* of a head (either *s-selection* or perhaps just *c-selection* in the sense of Chomsky (1986)a: 86ff.) and make them enter into the definition of L-marking: a maximal projection is L-marked only if it is governed in the canonical direction by a head selecting it.<sup>19</sup> Since, independently from  $\theta$ -marking and categorial features, *ci* at least does c-select its subject, we are now able to conclude that when *ci* undergoes incorporation then the copula (derivatively) L-marks the lower NP and then Subjacency is not violated because the small clause does not inherit barrierhood.

Eventually, three corollaries can be derived by this analysis which have non-trivial consequences. First, notice that from an X'-theoretical point of view *ci* belongs to the class of heads. Thus, the process of *ci*-raising is an instance of head-to-head movement. Whatever the conditions licensing this kind of process are (e.g. the *Head Movement Constraint*, proposed by Travis (1984)), it is clear that they must not block the possibility for the head to which they move to activate agreement features. For example, object cliticization in Italian does not block agreement of the verb with the subject as in *loro<sub>j</sub> lo<sub>i</sub> videro<sub>j</sub> t<sub>i</sub>* (they him-saw-third.plur.). Now, since movement of the embedded subject from the small clause is formally licensed by the agreement morphemes contained in the copula which act as a proper governor, the prediction is made that in a *ci*-sentence the subject can be raised to preverbal position. Disregarding the categorial status of *ci*, we can represent the situation as follows:<sup>20,21</sup>

(37) [IP [NP molte persone]<sub>j</sub> [c<sub>i</sub>'erano]<sub>j</sub> [SC t<sub>j</sub> [XP[X' $\theta$ t<sub>i</sub>]]]] ]

Second, as we already noticed, it is not sufficient for a head to be a V° in order to be "lexical" in the relevant sense of the term and neutralise Subjacency effects. Although we will not develop this matter here, it is clear that such a fact must be taken into account when any intentional definition of barrier is developed: in particular, this analysis shows that the selectional properties of heads might be derived by incorporation of lower lexical elements.

Third, the idea that *ci* lexicalises the copula immediately accounts for the following contrast:

- (38)a la causa della rivolta erano \*(le) copie del libro  
 (the cause of the riot were copies of the book)  
 b c'erano (le) copie del libro  
 (there were copies of the book)

It has been noticed (see Benincà (1980), Longobardi (1991)) that empty determiners are licensed in Italian only if the DP is governed by a "lexical head". Typically, empty D°s are found when the DP is governed by a V° (see Diesing (1990)): (38) clearly shows that this is not a sufficient condition. In both cases, the embedded DP is properly governed by the copula, hence by a V°, witness the possibility for it to be raised to precopular position under the proper structural conditions. Nevertheless, only when *ci* is present can the empty D° be licensed.

Again, the conclusion is that the notion of "lexical head" does not immediately derive from morphological properties: in order for the copula to be "lexical" it must in-

clude some selectional property that qualify it as such, in particular it is not sufficient for it to belong to the class of  $V^\circ$ s. Moreover, the very fact that *ne*-cliticization and licensing of an empty  $D^\circ$  correlates with the presence/absence of *ci* would be highly suspect if it were not the reflex of a unique fact.<sup>22</sup>

Notice that this state of affairs is not a surprising for those theories regarding the copula as the support of inflectional morphemes, according to the Aristotelian tradition we are also following.

In this section, we provided evidence that the analysis we adopted for the asymmetry of copular sentences is well established on empirical grounds. In particular it is clear that any attempt to derive the core cluster of properties that characterize the structural status of the subject of embedded clauses must be based on the interaction of two conceptually distinct principles, namely ECP and Subjacency.

We showed that although the copula can potentially always play the role of a *proper head governor* by means of the agreement features contained in it, it cannot per se play the role of an *L-marker*. Since this property is related to the selectional capacities of a head, only if the predicate of the NP it governs (i.e. *ci*) is incorporated into it, the new complex headed by the copula acquires such a capacity.

### **5. Some consequences addressed: speculation on a new type of clausal structure**

The work we have done so far suggests some reflections on the general strategy by which lexical elements are combined to construct clauses. The first observation is related to the very existence of copular sentences. Consider the following paradigm:

- (39)a una foto del muro fu la causa della rivolta  
"a picture of the wall was the cause of the riot"  
b una foto del muro causò la rivolta  
"a picture of the wall caused the riot"

In a certain sense the two sentences are completely equivalent: they contain the same thematic relations and bear the same truth values. The only difference is that in (39a) the head of the predicate is an  $N^\circ$ , thus forcing the inflectional morphemes to be realised autonomously. In the second sentence, on the other hand, the predicate is headed by a  $V^\circ$ , thus the inflectional morphemes can (and in fact must) be directly incorporated in it. If we focus on the relevant fragment we have:

- (40)a ... [ $I^\circ$  fu] ... [ $N^\circ$ causa] ...  
b ... [ $I^\circ$  caus<sub>k</sub>- [ $I^\circ$  ò]] ... [ $V^\circ$ t<sub>k</sub>] ...

The element  $-\delta$  is the verbal equivalent of the inflected form *fu* of the copular system, realising the third person of the past indicative tense (cfr. English *-ed* vs. *was*) A sharp and immediate question arises here: do these two options constitute a redundancy within the system of Universal Grammar or do they allow the expression of different meanings?

Hadn't we developed a unified theory of copular sentences, it would be very hard not to see them as a mere redundancy. Nevertheless, within our approach the answer is quite different. Only from a sentence like (39a), that is only from the case in (40a), can we "trap" the subject in a context from which it cannot be moved. As we partially showed in this paper, this has non-trivial consequences: for example, it implies that the subject cannot have scope over the entire clausal structure (cfr. (5a-b)), affecting the logical form of the corresponding sentence. The same effect could never be obtained in case we had a situation of the kind expressed in (39b)-(40b).

Two final remarks: at some point in our discussion we have called *ci*-sentences "existential sentences": this semantic label deserves a particular treatment which cannot simply be ignored. A detailed analysis of the so called "existential meaning" has been proposed in Moro (forthcoming): in particular, the structure of *ci*-sentences we propose here

is employed to understand the Definiteness Effect and explain the cross linguistic variation related to it as a consequence of a syntactic parameter, namely the pro-drop.

Eventually, it has not escaped our notice that the empirical tests we applied to Italian *ci*-sentences give exactly the same results we obtain when diagnosing unaccusative constructions: *ne*-extraction, in particular, but also auxiliary selection, past participle agreement etc. This suggests that the a "head" like *arrivare* ("arrive") might hide a more complex underlying structure: in particular, the raising of *ci* suggests that "unaccusativity" is not a primitive notion but rather the result of a process of a lexical composition involving the raising of more abstract entities. To put it simply, our approach opens the possibility to analyse *arrivare* on a par with *esserci* involving clitic predicates raising from a small clause constituent. This would fit in with the principle and parameters framework where crucially no structure specific assumption is allowed but the complex surface data are to be decomposed in the interaction of independent simpler factors.<sup>23</sup>

### Footnotes

(\*) This is a substantial revision of a subpart of a theory that I elaborated while I was at MIT as a Visiting Scientist in 1988/89 (which circulated as Moro (1991)a). I had many helpful comments since then: special thanks to Luigi Burzio, Noam Chomsky, Guglielmo Cinque, Giorgio Graffi, James Higginbotham, Richard Kayne, Anthony Kroch, Giuseppe Longobardi, Alec Marantz and Luigi Rizzi.

(1) It is notable that grammarians have been aware of this phenomenon since the very first steps in this field. Aristotle himself, while discussing copular sentences (see Graffi (1986)), noticed that "Μετατιθέμενα δὲ τὰ ὀνόματα καὶ τὰ ῥήματα ταῦτον σημαίνει" ("You can transpose the Subject and the predicate. No change in the meaning, however, of the sentence is thereby involved"; *De Interpretatione*, X-20, transl. by Cooke, H. P.). For a sketchy account of the development within generative grammar see footnote (6) in this paper.

(2) Since Rizzi (1982) it has been assumed that wh-movement from subject position in Italian is in fact wh-movement from postverbal position, the subject being realised as *pro*. In the first version, the idea was that the subject is first adjoined to VP from where its variable can be properly governed by V°. In Rizzi (1990) this version is modified by the assumption that the variable is properly governed by T°. If we adopt the idea that the subject is basically generated in spec-VP (see Koopman-Sportiche (1988)), then a further natural modification would be to assume that this is the position from where the trace under discussion can be properly governed without involving rightward movement (for a proposal of accessibility of spec position to government by a higher head see Moro (1988) and chapter 2 of Giorgi-Longobardi (1991)). Paralleling this approach, we can assume that the trace of the subject of copular sentences is properly governed by the copula without assuming postverbal VP adjunction. This possibility is being developed in a work in progress (see Moro (1991)b) within a broader project aiming to unify the notion of proper governor. For the purpose of this paper it is not necessary to commit oneself to any choice: in the only example involving wh-movement from preverbal position, i.e. (3a), we will simply indicate the origin of the chain in preverbal position.

(3) The conditions allowing the quantifier to melt with negation are not completely understood, as far as I know. In particular, notice that the fact of being within the scope of negation is only a necessary condition to trigger such a process:

- (i)a [IP John didn't read many books]
- b [CP [C° didn't]<sub>i</sub> [IP John t<sub>i</sub> read many books]]

A suitable paraphrase, replacing *few* in the place of *many* instead of *-n't ... many*, would be possible only in the first sentence. In the second sentence, the negation can only have the so called "sentential interpretation" yielding "isn't it the case that John read many books?". For a possible line of reasoning to solve this problem, see footnote (19).

(4) Contrary to Moro (1988) we will not assume that small clauses are projected by a head, namely AGR°. If agreement might be required in certain cases, like (1a), it is also clear that the two NPs within a small clause can mismatch both in gender and number, like (1b):

- (i)a Ritengo [Gianni mio amico/\* miei amici]  
(I believe Gianni my friend/my friends)
- b Ritengo [loro la causa]  
(I believe them-masch.plur. the cause-fem.sing.)

The assumption that small clauses are not projected by any head has been independently supported by Longobardi (1988). Notice that this does not imply that a small clause is not a constituent.

(5) To focus on those empirical facts which are relevant for the theory of clausal structure, we will substantially limit the range of data to a subset of those copular sentences containing a predicative nominal. In particular, we will disregard those pairs of NPs which cannot be permuted (cfr. *John is (a) cook*, \* *(a) cook is John*), assuming the conceivable hypothesis that this phenomenon is to be related to the internal (logical) structure of the NP rather than to the clausal structure itself. Although this topic has not been completely understood yet, the major lines of a recent analysis can be found in Higginbotham (1987). I am indebted to Jay Keyser for a discussion about this topic.

(6) The Aristotelian theory of the role of the copula (carried within medieval culture by Boethius translation of *De Interpretatione*, see Graffi (1986), and first named as such by Abelardus) arrived until modern times passing through the work of Leibniz (see Ishiguro (1990)<sup>2</sup>: 102) and Port Royal (see Graffi (1991)). So, we find clear references to this theory in linguists of this century, as in Jespersen (1928). The reason of the recent debate about this issue seems to be related to the enormous influence of the logic thought of Bertrand Russell who considered the copula as essentially dichotomic, carrying either the content of "predication" or that of "identity" (see Russell (1919)).

Within generative grammar, the debate has been pioneered by Ruwet (1975) who arrived at the conclusion that the anomaly of copular sentences should be treated by referring to the semantic asymmetry of the two NPs involved in its construction, essentially following Higgins (1973). A crucial step has been taken by Longobardi (1985) who defended the Aristotelian theory on empirical grounds, without arriving, however, at a unified syntactic theory. In fact, this is the point from which our work departs: for a more detailed discussion about this debate see Moro (1988), (1991)a.

(7) This analysis implies that adjunction of NP<sup>2</sup> to the small clause is impossible. This assumption follows from an independent condition on landing sites that has been

proposed by Chomsky (1986)b, p.16. Following the spirit of such an approach one can assume that adjunction to a maximal projection is not possible if it is the complement of a lexical head. The intuitive fact that this condition aims to capture is that if this were possible, the lexical head would "see" the first element as an argument, depriving the most embedded one of its  $\theta$ -role (see footnote (15)).

(8) It has been noticed, Michael Kenstowicz (p.c.), that in some marginal cases the predicative NP can show up in preverbal position without triggering agreement. Crucially, this can happen only if a certain element occurs compatible with  $C^\circ$ , instantiating a "verb-second" construct:

- (i) Only the cause of the riot were they, not the real promoters

Our assumption that the predicative NP is normally raised to spec-IP rather than spec-CP is still tenable.

(9) It is not necessary here to adopt the so called "split INFL hypothesis" proposed by Jean-Yves Pollock developing a fundamental intuition by Emonds (1985) (see Pollock (1989)) and by Moro (1988). What is crucial here is that the agreement features contained in the verb at the phonological level are to be traced back to an independent element which is lower than Comp periphery and higher than the predicational "kernel".

(10) The assumption that predicative linking "in a Fregean sense" holds within a small clause allows us to show that this relation is independent from  $\theta$ -role assignment, with some non-trivial consequences. Take for example a predicative nominal projected by a lexical head like *paura* ("fear"). The corresponding NP can contain two arguments, say *Gianni* and *punture* ("injections") receiving two different  $\theta$ -roles, the "experiencer",  $\theta_1$ , and the "theme",  $\theta_2$ :

- (i) [NP la paura di [Gianni]<sub>+ $\theta_1$</sub>  per [le punture]<sub>+ $\theta_2$</sub> ]  
(the fear of Gianni for the injections)  
"Gianni's fear of injections"

A reasonable prediction is that if this NP plays the role of the predicate within a small clause, then one of the arguments within its projection must be "suspended", in a sense to be formalised, and assigned to the subject. If we assume Koopman - Sportiche (1988) framework, the situation would be entirely parallel to the case where the predicate is a VP. This prediction is indeed true:

- (ii)a Ritengo [SC le punture<sub>+ $\theta_2$</sub>  [NP la paura di Gianni<sub>+ $\theta_1$</sub>  (\*NP)]]  
(pro believe the injections the fear of Gianni)  
b le punture<sub>+ $\theta_2$</sub>  sono [SC t [NP la paura di Gianni<sub>+ $\theta_1$</sub>  (\*NP)]]  
(injections are the fear of Gianni)

Two further facts should be noticed: first, only the "theme" can be assigned to the subject position, cfr. (iia) vs. (iiaa); second, both arguments can stay within the NP, without preventing it to play the role of predicate (iib), witness the possibility of *lo*-cliticization in a copular sentence like (iic):

- (iii)a \*Ritengo [SC Gianni<sub>+ $\theta_1$</sub>  [NP la paura per le punture<sub>+ $\theta_2$</sub>  (\*NP)]]  
(pro believe Gianni the fear for injections)  
b Ritengo [SC questa [NP la paura di [Gianni]<sub>+ $\theta_1$</sub>  per [le punture]<sub>+ $\theta_2$</sub> ]]  
(pro believe this the fear of Gianni for the injections)  
c questa lo è [SC t t ]  
(this *lo* are)

We are led to conclude that the subject of the small clause can satisfy the predicative linking without being the target of a  $\theta$ -role, (iii**b-c**). It is interesting to notice that this non-thematic subject does not create an opaque domain for an anaphor contained within the predicative nominal: the binding domain would rather be created by a thematic subject contained within the NP (for different conclusions see chapter 1 and 4 in Giorgi-Longobardi (1991)). Take for example the following case:

- (iv)a Gianni ritiene queste le migliori foto di se stesso/\*se stesse  
(Gianni-mas.sing believes these-fem.plur the best pictures of himself-mas.sing/fem.plur)
- b Gianni ritiene queste le miglior foto di Maria di se stessa/\*se stesso  
(Gianni-mas.sing. these the best pictures of Maria-fem. sing. of herself/himself )

The features contained in the anaphora in (iv**a**) must be compatible with those of the subject of the matrix clause, not with those of the non-thematic subject of the small clause. If a thematic subject is contained in the predicative NP, (iv**b**), then the anaphoric features must agree with it. Disregarding the important but not crucial questions raised by the occurrence of *PRO* in NPs (cfr. *John and Mary considered these each other's best performances*; for *PRO* see Giorgi Longobardi (1991)), this leads us to conclude that predicative linking is not only independent from case but also from  $\theta$ -role assignment.

(11) Since we are assuming A'-movement of postcopular subject to be impossible at all levels, the following sentence stands as a potential problem:

- (i) chi sono?  
(who am-first person singular)  
"who am I"

Notice first that this cannot be a case of wh-movement of preverbal NP because, as we noticed, there is no such a sentence as *\*NP sono*. The only possibility is that the wh-phrase is related to a postcopular NP. Were *chi* (who) moving a subject, like *io* in *sono io*, we should conclude that not only our generalization on A'-movement is to be relaxed here but copular sentences are also exceptional w.r.t. all other cases of wh-movement of a subject by *chi*. In fact, in Italian this is only compatible with third person singular:

- (ii)a pro arrivo io/ pro arriva Gianni  
(pro arrive-first person singular I/ pro arrive-third person singular Gianni)
- b chi arriv-a/\*-o  
(who arrive-third person singular/ first person singular)

This suggests that the case in (i) is rather a case of wh-movement of the predicate, to be represented as (iii), according to our theory :

- (iii) [CP  $chi_j^2 C^\circ$  [IP  $pro_i^1$  sono [SC  $t_i t_j$  ]]]

This representation is now consistent both with the restriction on A'-movement from postcopular subject position and with the factual generalization in (ii) we will not explain here.

By anticipating one of the major result we will draw in this paper we can refine the representation in (iii). In section 3.3., we will show that the copula can perform the role of proper governor for one and only one empty category (via agreement features contained in it). If this is true the two NP of a small clause governed by the copula cannot be simultaneously moved. To solve this problem we can adopt a proposal discussed in Moro (forthcoming), that *chi* is related to the NP (as the interrogative counterpart of *lo*) and extracted from a larger nominal phrase, i.e. DP, possibly via its spec:

- (iv)a [CP  $\text{chi}_j^2$  C° [IP  $\text{pro}_i^1$  sono [SC  $t_i$  [DP  $t_j$  D°  $t_j$  ]]]]  
 b [IP  $\text{pro}_i^1$  [lo<sub>j</sub> sono] [SC  $t_i$  [DP  $t_j$  D°  $t_j$  ]]]

In general, a revision of the taxonomy for *wh*-elements is in order for independent reasons since the notion of "noun phrase" is being improved. In particular, following again Moro (forthcoming), elements like *what* and *which* should be related to different projections, respectively NP and DP. As Sylvain Bromberger (p.c.) pointed out, this allows us to understand the very different interpretation of sentences like *which (one) is water?* and *what is water?*:

- (v)a [CP [DP *which one*]<sub>j</sub> is<sub>j</sub> [IP  $t_i$   $t_j$  [SC  $t_i$  [DP D° *water*]]]]]  
 b [CP [NP *what*]<sub>j</sub> is<sub>j</sub> [IP  $t_i$   $t_j$  [SC [DP D° *water*] [DP D°  $t$  ]]]]

A part from the question related to raising of the N° *water* to D° (see Longobardi (1991)), the representations in (v) say that (va) is a canonical question asking which element has the property of being water while (vb) is an inverse question asking which properties the element called "water" has.

(12) The core empirical case ECP is to cover is the classical subject-object asymmetry w.r.t. extraction across an overt complementiser in English (see also footnote (2)):

- (i)a [which man] do you think [CP  $t$  (\*that) [IP  $t$  loves this woman]]?  
 b [which woman] do you think [CP  $t$  (that) [IP this man loves  $t$  ] ]?

ECP has recently undergone a radical revision in the two potential directions implied by this dichotomic version: it has been reduced either to the formal licensing component (Rizzi (1990)) or the identificational one (Chomsky (1986)b). Assuming Rizzi's approach as a possible point of departure, I have proposed in Moro (1991)b that the notion of proper governor can be defined intensionally (essentially by reducing formal licensing to agreement with a local head, given the distribution of AGR° assumed in Chomsky (1988)), avoiding the introduction of a mere *list* of proper governors within class of heads as both Chomsky (1986)b and Rizzi (1990) in fact do.

(13) Along with the cases mentioned in the text, partially exemplified here in (ia-b), the core empirical cases of *wh*-movement that an up-to-date version of Subjacency is to rule out include extraction from (adverbial) adjuncts (ic) (see the different treatment of (ic) in (Chomsky (1986)b: 31 vs. Cinque (1990): 27)):

- (i)a \* the man  $\text{who}_i$  [IP [NP pictures of  $t_i$  ] are on the table]  
 b \* to whom<sub>j</sub> did John write [NP a book [CP (for parents) to read  $t_j$  ]]  
 c \*  $\text{who}_i$  did [IP they leave [ $\alpha$  before speaking to  $t_i$  ]]

*Mutatis mutandis*, we will see that extraction from postcopular NP in inverse copular sentences would be instantiating the same type of violation as the one in (ia).

(14) Sometimes, the "degree" of ungrammaticality of a certain violation is considered as a relevant symptom to diagnose the type of violation involved: for example, it is often assumed that ECP violations are "stronger" than those derived by Subjacency. Since the empirical range of phenomena that a certain principle is to cover depends on the entire system one adopts, I will not adopt such a "realistic" point of view.

(15) Chomsky's (1986)b condition on adjunction we reported in footnote (7) does not exclude adjunction to the subject of an inverse sentence:

- (i) ... [SC [NP t<sub>i</sub> [NP ... t<sub>i</sub> ...]] ...

If this were possible, then Subjacency should not be violated. To overcome this unwanted result, we can slightly reformulate such a condition as follows. Adjunction to a maximal projection is possible only if it is not *selected by a lexical head*, or *s-selected* (following Chomsky (1986)a) at some level of derivation. Thus, even if the subject is not the complement of a lexical head, (i) would be ruled out; on the other hand, since predicates are not selected by a lexical head (indeed, by no head at all), they will still allow adjunction.

Notice that, since C° and the copula are not lexical, or alternatively since they are only able to *c-select* (see Chomsky (1986)a), adjunction to their complements is possible:

- (ii) ... [SC/IP t<sub>i</sub> [SC/IP [NP ...t<sub>i</sub> ... ] ...

This does not imply that the Subjacency violation is not produced in (ii). From an informal point of view, one can reason as follows: adjoining β to XP, has always been intended as a formal way to represent the fact that β has, roughly speaking, gone "beyond" the XP (see Chomsky (1986)b: 9). Now, if we look at (ii) from the point of view of Subjacency principle, it is reasonable to conclude that this principle is still violated because the chain does cross in a single step two arguments, SC/IP and NP, although the landing site of the second step lies beyond SC/IP. This is consistent with the idea that when the adjunction occurs to the lower potential barrier, as in the case of extraction from a predicate, this would make the chain escape a Subjacency violation: in fact, it would start from "beyond" the potential barrier, neutralising its role.

(16) It should be noticed that case assignment goes as usual to spec-IP. If we take an English infinitival sentence this would be rather clear:

- (i)a [\*<sub>i</sub>(for) there<sub>i</sub> to be [a fascist t<sub>i</sub>]] is not unusual  
 b [\*<sub>i</sub>(for) the cause of the riot<sub>i</sub> to be [a fascist t<sub>i</sub>]] is not unusual

For the issue related to the Definiteness effect see Belletti (1988) and Moro (forthcoming). Notice also that the long standing question concerning the presence of a nominal element binding the postcopular NP from an A-position can be better understood here: there is no binding theory condition C violation because this condition prohibits that two elements referentially independent be coindexed. Since here the higher NP is a predicate, coindexation is not only tolerable but perhaps also required by general assumptions on predicative linking, if one follows Williams (1980).

(17) Of course, this raises the problem of determining the class of XPs which can appear in adjunct position. Since this issue is not particularly related to copular sentences we will not develop this matter here (see Moro (forthcoming) for some general hints).

(18) Here, we only mean that the assumption that *ci* is non-distinct from [+V] cannot be simply stipulated not that it is necessarily false. On the contrary, it might turn out to be correct but at this point I do not see any conceptual reason to take such a step. Notice that it is not sufficient to be cliticized on a V° to be non-distinct from [+V] otherwise all clitics in Italian would have the same property, which is not consistent with the fact that they can head chains of NPs, hence of ([+N,-V] elements). Nevertheless, if this assumption will eventually prove tenable on empirical grounds, the range of phenomena involving *ci* would entirely fit into Cinque's (1990) framework.

(19) Notice that this definition cannot be biconditional. In fact, it is clear that the raising of a head to a position canonically governing an NP it selects is not sufficient to allow L-marking of this NP, otherwise  $V^{\circ}$ -to- $C^{\circ}$  constructions should allow escaping Subjacency from a subject in spec-IP, contrary to the facts (see also footnote (3)). For example, given that  $V^{\circ}$  does select its arguments, NP<sub>1</sub> and NP<sub>2</sub>, *ne*-cliticisation in (i)a should be grammatical on a par with the one in (i)b:

- (i)a \* [CP t<sub>i</sub> [C<sup>o</sup> leggendo<sub>j</sub>-ne<sub>i</sub>] [IP[NP<sub>1</sub>un figlio t<sub>i</sub>] [V<sup>o</sup>t<sub>j</sub>] [NP<sub>2</sub>molti libri di Platone]  
 (reading-of him a son many books of Plato)  
 b [IP[NP<sub>1</sub>un figlio di Aristotele] [I<sup>o</sup> ne<sub>i</sub>-leggeva<sub>j</sub>] [V<sup>o</sup>t<sub>j</sub>] [NP<sub>2</sub>molti libri t<sub>i</sub>]  
 (a son of Aristotle of-him read many books)

The inadequacy of our definition of L-marking is not surprising, though (see also footnote (3)). Up to this point, we have just indicated the process that *ci*-movement involves as *incorporation*, without paying attention to the "kind of incorporation" produced. Although we will not develop this matter here one might reasonably explore the possibility that the notion of L-marking be defined by taking into account the morphological processes involved, according to the lines pioneered in Rizzi - Roberts (1989), along with the selectional properties of the head involved.

(20) The fact that the subject can be raised to precopular position as indicated in (37) might suggest that proper government and L-marking in fact go together, that is extraction occurs only from those NPs that can be moved, undermining the crucial idea that these are distinct properties. This is a false conclusion and a rather misleading one: as it has been proved in Moro (1991)a and Moro (forthcoming), in English these two properties are clearly disjunct in the same contexts.

Without developing the analysis in full details, consider for example *wh*-movement in (ia-b) and QR in (ic-d):

- (i)a \* which girls<sub>i</sub> do you think that there<sub>j</sub> are [SC t<sub>i</sub> t<sub>j</sub> ]  
 b which girls<sub>i</sub> do you think that there<sub>j</sub> are [SC [NP pictures of t<sub>i</sub> ] t<sub>j</sub> ]  
 c there<sub>j</sub> aren't [SC [NP many pictures of elephants] t<sub>j</sub> ]  
 d there<sub>j</sub> aren't [SC [NP pictures of many elephants] t<sub>j</sub> ]

In both cases *A'*-movement of the postcopular NP is blocked (by ECP) but nevertheless *extraction from* it (potentially triggering a Subjacency violation via failure of L-marking) is entirely possible.

(21) The idea that *ci* is a place holder for the subject of predication was assumed to be supported by the ungrammaticality of sentences like the following:

- (i) Gianni (\*c')è in giardino  
 (Gianni there-is in the garden)

This is a misleading conclusion. The fact that *ci* and *in giardino* cannot occur together here is due to a general independent restriction avoiding clitic doubling in Italian (cfr. *Gianni (\*lo) lesse il libro* (Gianni *lo*-read the book)). In fact, if we favour a reading where *in giardino* plays the role of an adjunct, e.g. by inserting an adverb like *mai* (never), as in:

- (ii) Gianni non c'è mai in giardino  
 (Gianni not there-is never in the garden)

the sentence becomes acceptable, a rather surprising fact if one maintains the traditional approach.

(22) That *ci* can play the role of (pro)predicate can be independently supported by examples like:

- (i) Gianni il tuo migliore amico? non ce<sub>j</sub> lo<sub>i</sub> vedo proprio [SC t<sub>i</sub> t<sub>j</sub> ]  
 (Gianni the your best friend -- not there-him-see indeed)  
 "Gianni your best friend? I cannot think of him as such"

Nevertheless the syntax of *ci* is much more complex. Along with an *existential* and *propredicational* use we mentioned, we have a *locative* use (iia), a *possessive* use (iib) and a *sentential emphatic* use (iic).

Although a detailed analysis should be given, we can simply suggest the minimal assumption our theory would lead us to take, namely that in all cases this element is basically generated as a predicate in a small clause and indicate it as follows::

- (ii)a Gianni ci mette [SC il burro t ]  
 (Gianni there-puts the butter)  
 "Gianni puts butter in it"  
 b Gianni c'ha [SC un cane t ]  
 (Gianni there-has a dog)  
 "Gianni has a dog"  
 c pro c'è [SC [CP che Gianni è stanco] t ]  
 (there-is that Gianni is tired)  
 "the fact is that Gianni is tired"

The raising analysis of *ci* will also shed new light on the occurrence of this element with passives (see Burzio (1986): 154, 176f.). In particular the following contrast can be immediately explained:

- (iii)a (\*ci) erano [VP bruciate molte case]  
 (there were burned many houses)  
 b \*(ci<sub>i</sub>) erano [SC [NP molte case<sub>j</sub> [VP bruciate t<sub>j</sub> ]] t<sub>i</sub> ]  
 (there were many houses built)

When *molte case* (many houses) stays within the VP there is no possibility to relate *ci* to the position of predicates within small clauses, because there is no small clause at all, thus we can only have a *pro* in subject position. On the other hand, when *molte case* is extracted from a VP, creating a complex NP with a secondary predicate, a small clause is construed and consequently a predicate is needed in order to have a well-formed sentence: this role is performed by *ci*.

(23) Not only unaccusative constructions can be potentially reinterpreted as inverse sentences in the sense we are establishing here. This new type of clausal structure has other plausible candidates: I have elsewhere proposed (see Moro (1991)a) that constructs involving *seem* undergo the same kind of analysis. This is not only true in rather trivial cases like:

- (i) [IP[the cause of the riot]<sub>i</sub> seems [t<sub>i</sub> to be [John t<sub>i</sub> ]]]

where *seem* recursively duplicates the inverse copular structure adding one more step to the chain headed by the predicate. This analysis can be much more interestingly applied to distinguish cases like:

- (ii)a [IP [IP it<sub>i</sub> is [SC t<sub>i</sub> obvious]] that John left]  
 b [IP it<sub>i</sub> seems [SC [that John left] t<sub>i</sub> ]]

The sentence involving *seem* in (iib) would be entirely parallel to that involving *esserci*, with the major difference that the subject of *esserci* is an NP vs. the subject of *seem* which is an inflected CP.

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**Proper Names and the Theory of N-movement  
in Syntax and Logical Form \***

O. Introduction

In recent years, formal syntactic theory has broadened its scope and has come to interact more and more closely with parallel domains of study, in particular with such well established traditions of inquiry as comparative dialectology, language typology and analytic philosophy, fruitfully exchanging insights and research techniques. As a result, it became possible to raise and solve new meaningful problems, which would have been hardly conceivable as early as twenty years ago, and also to sharpen the formulation of more traditional questions so as to provide them with adequate empirical answers.

Within such an enlarged framework of interests and methods, the present paper will consider evidence from Romance and Germanic suggesting the following theoretical conclusions:

- a) there exist instances of N movement to D in the syntax of Western Romance, implying the correctness for such languages of the so called DP analysis;
- b) the same type of movement is likely to take place only in LF in English and German;
- c) head-to-head relationships fall into essentially the same categories as those between maximal projections: they define chains or CHAINS (in Chomsky's 1986a

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terms), and chains are created either by substitution or by adjunction, with distinct properties;

d) various semantic types of articleless nominals (proper names, existentials, definite and indefinite generics, non-argument nominal phrases) are distinguishable by their syntactic behavior at S-structure and LF and a plausible theory of the semantic licensing of NPs and DPs can be envisaged: proper names and generics are so distinguished also from definite descriptions, suggesting a possible syntactic answer (in the spirit of Kripke 1980 or Neale 1990) to long standing philosophical questions;

e) the definite article of many European languages can be shown to cover two different functions, a substantive and an expletive one, a distinction morphologically manifested in some varieties <sup>1</sup>.

## 1. DPs and NPs

Consider, to begin with, that in the light of the generalization of X'-theory to all lexical and non-lexical categories, two positions have recently emerged about the structure to be assigned to projections of determiners: one view locates Determiner Phrases inside Noun Phrases, precisely in their Spec position, the other, originally stemming from an intuition of Szabolcsi (1983/4 and subsequent work), conceives of the whole nominal construction as coinciding with DP and of NP as a complement of the head D (cf. in particular Abney 1986, 1987). Schematically, the two hypotheses can be best summarized as in (1) and (2) respectively:

(1) [NP DP[N' N]]

(2) [DP [D' D NP]]

Although the problem of the choice between the two views proved not to be easy to solve on empirical grounds, one line of argument in favor of the structure advocated by Szabolcsi and Abney appears to be especially promising and has been explored in order to try to decide the issue conclusively in certain languages: consider, in fact, that, if movement can be argued to apply in some language from inside NP to a position inside DP, e.g. from Spec to Spec or from the position of N<sup>0</sup> to that of D<sup>0</sup>, then the structure in (1) will be immediately discarded, under any current theoretical

---

<sup>1</sup> This notion of expletive article appears to be the syntactic and morphological parallel of the analogous concept elaborated on semantic grounds by Vergnaud and Zubizarreta (1990, 1991).

approach, by the ban against movement to a non-c-commanding position. Movement from the Spec of NP to the Spec of DP might be instantiated in English, if the pair in (3) is to be related transformationally <sup>2</sup>:

- (3) a. A very strange man  
b. How strange a man

Head-to-head movement from N<sup>0</sup> to D<sup>0</sup> has been tentatively argued to apply in Semitic (cf. Ritter 1986,1988, Ouhalla 1988, Fassi Fehri 1988, Siloni 1989,1990 and references cited there) and Scandinavian. Taraldsen (1990), for instance, analyzed the following Norwegian paradigm in terms of N-raising:

- (4) a. Hans bøker om syntaks  
His books about syntax  
b. Bøkene hans om syntaks  
Book-s-the his about syntax

(4)a. shows the normal SNO structure of Germanic NPs (cf. Giorgi and Longobardi 1991), where the subject can be independently argued to asymmetrically c-command the object; (4)b. instantiates an alternative N-initial order in which the subject can still be shown to asymmetrically c-command the object: thus Taraldsen rejects the possibility of its base-generation and proposes to derive it from the one in (4)a. by means of N-raising to D, thus supporting a DP analysis for Norwegian nominals <sup>3</sup>. In fact, the head N appears in (4)b. to be morphologically adjoined to the article.

It is also possible perhaps to extend Taraldsen's analysis to all cases of suffixed articles in Scandinavian, accounting for such common alternations as the following:

- (5) a. En bok  
A book  
b. Boken  
Book-the

A similar approach was also successfully taken in the study of suffixed definite articles in Rumanian (Grosu 1988, Dobrovie-Sorin 1987).

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<sup>2</sup> On this construction see also Hendrick (1989).

<sup>3</sup> It remains still undetermined within this analysis whether the typical Germanic pronominal genitive, like *hans* of (4)a., occurs in the Spec of NP or in that of DP. For some discussion of this point, however, cf. fn. 26 below.

However, evidence of this sort, as well as of the other types discussed particularly in Abney (1987), can hardly be reproduced in the Western Romance languages (cf., now, however, Bernstein 1991a), for which the choice between (1) and (2) has so far remained more undetermined (although the DP analysis has been occasionally employed to treat aspects of Romance nominal syntax: cf. e.g. Torrego 1988, Battye 1989, Brito 1990). In what follows we will examine evidence of a completely different nature, even more directly suggesting that instances of N-to-D movement must be postulated in Western Romance as well, and thus providing, in turn, further support to the structure in (2) and to the theory of head movement. In order to do so, we must first analyze the referential properties of Ns and Ds.

## 2. Bare nouns

Let us begin, first of all, by noticing that a singular countable head noun may not occur in Italian in any of the major positions suitable for arguments (e.g. subject, direct object, prepositional object, inverted subject of either ergative or unergative predicates) without being introduced by an overt determiner, most usually a definite or indefinite article, a quantifier or a demonstrative <sup>4</sup>:

- (6) a. \*(Un/Il) grande amico di Maria mi ha telefonato  
 (A/The) great friend of Maria called me up  
 b. Ho incontrato \*(un/il) grande amico di Maria ieri  
 I met (a/the) great friend of Maria yesterday  
 c. Ho parlato con \*(un/il) grande amico di Maria ieri  
 I spoke with (a/the) great friend of Maria yesterday  
 d. Ha telefonato/E' venuto \*(un/il) grande amico di Maria  
 Called up/Came (a/the) great friend of Maria

The constraint in question is not at work with nominals in typical non-argument function, as in vocative, predicative or exclamatory contexts:

- (7) a. Caro amico, vieni a trovarmi  
 Dear friend, come to visit me

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<sup>4</sup> For this purpose we will classify among determiners also cardinals and certain quantity expressions, such as *molto* 'much', *poco* 'little', or *abbastanza* 'enough'. For some discussion of the issue and further distinctions see the approach taken in Giusti (forthcoming).

- b. Tenente, esegua l'ordine!  
Lieutenant, perform the command!

- (8) a. Gianni è tenente  
Gianni is lieutenant
- b. Gianni è amico di Maria  
Gianni is friend of Maria
- c. L'ho promosso tenente  
I promoted him lieutenant
- d. Ti credevo amico di Maria  
I believed you friend of Maria

- (9) a. Diavolo!  
Devil!
- b. Maledetto tenente!  
Damn' lieutenant!

There are also some kinds of PPs which admit of articleless singular nouns, but, pending further study, it is not implausible to assimilate them to predicative expressions on semantic grounds <sup>5</sup>:

- (10) a. In abito lungo  
In long dress
- b. Di buona famiglia  
Of good family

On the grounds of these observations we may tentatively propose the following principle of Italian grammar:

- (11) A 'nominal expression' is an argument only if it is introduced by a lexically filled D position

Although plausible and basically correct in spirit, (11) presents two shortcomings, one conceptual and one empirical: first, reference to the lexical, i.e. phonetic, content of the category D seems to be inappropriate and unparalleled in an essentially semantic licensing condition. Second, (11) appears to be simply too strong under this

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<sup>5</sup> However, the wide variety of determinerless nominals occurring within PPs can hardly be satisfactorily explained away by similar considerations and the whole problem deserves much more detailed analysis.

formulation; in fact, as noticed also in Benincà (1980), three types of bare nouns occur in Italian in argument function: singular mass nouns, plural count nouns (bare plurals), and even some rarer cases of singular count nouns in the scope of a sentential negation, although it is not clear whether the latter can be considered real arguments or rather quasi-idiomatic expressions <sup>6</sup>. Cf. the following examples:

- (12) a. Bevo sempre vino  
I always drink wine  
b. Mangio patate  
I eat/am eating potatoes  
c. Non c'era studente in giro (from Benincà 1980)  
There wasn't student around

In all these cases the interpretation of the nominal seems to be roughly similar to that of an indefinite, existentially quantified NP: in this sense bare nouns appear to bear some semantic similarity to the so called 'partitive' article (formed by *di* 'of' + a definite determiner) of Italian (and French): also the latter in fact is limited to mass head nouns and to plurals, for which it seems to represent the intuitive counterpart of the singular indefinite article <sup>7</sup>.

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<sup>6</sup> In fact most structures of this type are found in idioms or fixed expressions:

- (a) Non ha proferito verbo  
He didn't utter word  
'He didn't say anything'  
(b) Non ha battuto ciglio  
He didn't shake eyelash  
'He didn't finch at all'

In addition, many lexical choices of verbs and objects turn out to be quite marginal or even impossible in such a construction:

- (c) ??Non ha dipinto quadro  
She didn't paint picture  
(d) \*Non ha danneggiato scrivania  
She didn't damage desk

Such observations appear to confirm the non fully productive nature of this construction, as opposed e.g. to the French *pas...de NP* construction studied in Kayne (1981).

<sup>7</sup> Semantically, the partitive article distinguishes itself from 'classical' existential quantifiers like *alcuni* or *qualche* 'some', because in some positions and with certain predicates it may easily assume a strongly unspecific reading, which comes very close to a generic interpretation:

- (a) Dei cani grossi creano sempre questi problemi  
*Partit. art.* large dogs always raise such problems  
(b) Alcuni cani grossi creano sempre questi problemi  
Some large dogs always raise such problems

As the English gloss should clarify, the generic-like (henceforth, we will refer to it as 'indefinite generic' to distinguish it from the more typical generic structures expressed in Romance by means of the singular or plural definite article) reading is hardly acceptable in (b). Thus, in a sentence like (a) the partitive article appears once again to

There exist also some differences, however, which limit the analogy and force us to refrain from simply stating that bare nouns instantiate the phonetically ‘null’ version of the partitive article: an interesting peculiarity, for example, is that the number specification, i.e. the semantic distinction between singular and plural, may sometimes

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act as the plural (or mass) counterpart of the singular indefinite one, which does allow a similar generic interpretation:

- (c) Un cane grosso crea sempre questi problemi  
A large dog always raises such problems

The same is true of other indefinite determiners usually existentially interpreted, like cardinality expressions (numerals and *molti* ‘many’, *pochi* ‘few’, etc.):

- (d) Tre/Molti cani grossi creano sempre questi problemi  
Three/Many large dogs always create such problems

in this example the subject is easily understood as generic, in the sense of denoting every normal group of three/many large dogs. This observation may also help to clarify the semantic status of the indefinite generic reading displayed by (a) and (c): it is likely to denote every normal set of an indefinite number of dogs or of just one dog, respectively. It is thus plausible to postulate the logical relevance of a *Gen* operator, of the type proposed under various forms in much of the recent literature (cf. for instance Heim 1982, Kratzer 1988, Diesing 1988, 1989), quantifying here over sets.

The indefinite generic reading has a slightly derivative flavor with respect to the more regular existential interpretation of indefinite nominals, as witnessed by its unavailability with stage level predicates (in the sense inaugurated by Carlson 1977a):

- (e) Dei dinosauri furono uccisi da cause misteriose  
*Partit. art.* dinosaurs were killed by mysterious causes  
(f) Un dinosauro fu ucciso da cause misteriose  
A dinosaur was killed by mysterious causes

Here the subjects can only be existentially interpreted, whereas the generic reading is available *ceteris paribus* with definite NPs:

- (g) I dinosauri furono uccisi da cause misteriose  
The dinosaurs were killed by mysterious causes  
(h) Il dinosauro fu ucciso da cause misteriose  
The dinosaur was killed by mysterious causes

The availability of such a generic reading of indefinites also fails in certain environments, roughly non-subject positions and even subject positions of so called kind level predicates (in the sense of Carlson 1977b, i.e. predicates requiring a collective interpretation of one of their arguments necessarily encompassing the whole kind defined by the noun):

- (i) Studio dei dinosauri/un dinosauro  
I study *partit. art.* dinosaurs/a dinosaur  
(j) Dei dinosauri sono estinti  
*Partit. art.* dinosaurs are extinct  
(k) Un dinosauro è estinto  
A dinosaur is extinct

Again, in such environments, indefinites can only be existentially understood and the generic reading may be achieved just by definite nominals:

- (l) Studio i dinosauri/il dinosauro  
I study the dinosaurs/the dinosaur  
(m) I dinosauri sono estinti  
The dinosaurs are extinct  
(n) Il dinosauro è estinto  
The dinosaur is extinct

This is not surprising if *Gen* is supposed to be, like e.g. *every* or *each*, an intrinsically distributive quantifier, thus inappropriate for usage with necessarily collective predicates.

be irrelevant. Number is obviously irrelevant in the case of mass nouns and of a negated existential, which has null reference, but for bare plurals, Benincà (1980) has convincingly argued that they are often neutral between the singular/plural distinction; consider e.g. the following paradigm:

- (13) a. Ogni giorno mangia patate  
Every day he eats potatoes  
b. Ogni giorno mangia alcune/delle patate  
Every day he eats some/*partit. art.* potatoes

while uttering the second example, which contains an overt existential quantifier or the partitive indefinite article (here formed by contraction of *di* 'of' + *le* 'the' fem. plur.), we commit ourselves to the claim that the person in question eats more than a single potato per day, whereas in the first one we are free from such a plurality commitment. Another peculiarity concerns scopal phenomena: unlike all overt existential determiners, including the singular indefinite article and the partitive one, determinerless nominals of either English or Italian are subject to an obligatory narrow scope constraint: this applies with respect to negation, quantifiers and intensional contexts (thus producing a necessarily opaque or *de dicto* reading), as discussed by Carlson (1977a and b) precisely in order to distinguish between the indefinite article and bare plurals.

A plausible observational generalization appears therefore to be that existential quantification becomes expressible through a bare noun under certain special conditions. Now, is this existential interpretation of Italian bare nouns the consequence of an absolute lack of the category 'determiner' in these constructions or is it assigned as the default semantic option to an empty category syntactically present in the D position <sup>8</sup>? One fact appears to suggest the plausibility of the latter solution: the distribution of such bare nouns in Italian, as well as in other Romance languages, seems to be subject to a sort of lexical government requirement, similar to that constraining empty categories in general and empty functional heads in particular (e.g. empty Cs of finite clauses in English: cf. Stowell 1981). In other words, Romance bare nouns are usually excluded from preverbal subject position, but admitted in

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<sup>8</sup> The choice of this numberless existential reading (essentially, 'there exists at least one x') as the default value for Ds deprived of lexical content is likely to be due to its semantically unmarked (least informative) character. Notice, in fact, that such a notion can be construed precisely enough for such an operator according to criteria of difficulty of falsification: for it is less easily falsifiable (given a finite set of objects as a model, it always requires observation of the totality of them) than operators like 'there exist at least  $n$  x (for  $n > 1$ )', 'there exist at most  $n$  x', 'there exist exactly  $n$  x', or 'for every x'. All of these may actually require a smaller number of observations than the totality in order to be falsified.

internal argument position and, to a certain extent, also as inverted subjects of unergative predicates <sup>9</sup>:

- (14) a. \*Acqua viene giù dalle colline  
Water comes down from the hills  
b. Viene giù acqua dalle colline  
Comes down water from the hills  
c. Ho preso acqua dalla sorgente  
I took water from the spring
- (15) a. \*In questo ufficio marocchini telefonano sempre  
In this office Moroccans always call up  
b. In questo ufficio telefonano sempre marocchini (from Brugger 1990)  
In this office always call up Moroccans  
c. In questo ufficio incontro sempre marocchini  
In this office I always meet Moroccans <sup>10</sup>

Similarly impossible is a determinerless noun in another arguably non lexically governed position, that of postcopular argument expressions analyzed at length in Longobardi (1980, forthcoming):

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<sup>9</sup> The latter case is considered less acceptable in the current literature on the closely corresponding structures of Spanish: cf. Contreras (1986), Lois (1986) and Torrego (1989). Modern French, instead, doesn't seem to accept bare nouns (in the sense here discussed) at all. An intriguing line of explanation, relating the phenomenon to the poverty of number inflectional morphology of French nouns, has been proposed by Delfitto and Schrotten (1991). Their proposal is apparently supported by a diachronic correlation between the loss of bare nouns and the impoverishment of the declension in the history of French.

<sup>10</sup> Sentences such as (14)a. and (15)a. become more acceptable if the determinerless subject is phonologically and semantically focused. An obvious suggestion is that under this interpretation the subject may occur in a left peripheral position as the result of a topicalization transformation. Assuming that the lexical government requirement may be satisfied by the supposed empty head under 'reconstruction' of the whole topicalized constituent, the acceptability of the focused version of the two sentences in question would be due to the postverbal source of subject wh-movement in Italian (cf. Rizzi 1982): thus the 'reconstructed' analysis of such examples would be analogous to that of the grammatical (14)b. and (15)b. The hypothesis that a 'reconstructed' satisfaction of the lexical government requirement is possible is independently suggested by the acceptability of topicalization of a bare noun from object position:

- (a) ACQUA ho preso dalla sorgente!  
WATER I took from the spring!  
(b) MAROCCHINI incontro sempre, in quest'ufficio!  
MOROCCANS I always meet, in this office!

- (16) \*La causa delle rivolte sono spesso marocchini  
The cause of the riots are often Moroccans

No violation arises, on the contrary, if a non argument expression such as a predicative NP, even with a singular count head, occurs in a non lexically governed position, as is shown by the acceptability of (17), whose relevance was originally pointed out by L.Burzio (p.c.):

- (17) Amico di Maria sembra essere Gianni  
Friend of Maria seems to be Gianni

These observations may be taken to suggest that an empty category in need of lexical government is necessarily present in (12) through (16) but not in (17) <sup>11</sup>; if

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<sup>11</sup> According to the analysis of Longobardi (1980, forthcoming), the postcopular predicative position is always lexically governed, so it could in principle contain a predicate nominal introduced by an empty determiner. In fact, even if determinerless predicative expressions are exempted from the need for a phonetically null D, there seems to be some evidence that they can be introduced by such an empty category at least with mass and plural heads:

- (a) Gianni è medico  
Gianni is doctor
- (b) Gianni è un medico  
Gianni is a doctor
- (c) \*Gianni è medico che si cura davvero dei suoi pazienti  
Gianni is doctor who really cares for his patients
- (d) Gianni è un medico che si cura davvero dei suoi pazienti  
Gianni is a doctor who really cares for his patients
- (e) Noi siamo medici che ci curiamo davvero dei nostri pazienti  
We are doctors who really care for our patients
- (f) Noi siamo dei medici che ci curiamo davvero dei nostri pazienti  
We are *partit. art.* doctors who really care for our patients
- (g) Questa è acqua  
This is water
- (h) Questa è dell'acqua  
This is *partit. art.* water
- (i) Questa è acqua che è stata presa dalla sorgente  
This is water which was taken from the spring
- (j) Questa è dell'acqua che è stata presa dalla sorgente  
This is *partit. art.* water which was taken from the spring

the fact that relativization on a predicative head is only possible either with an overt determiner or with a plural/mass noun may suggest that the presence of a D position (subject to generalization (18)a. below in the text, if empty) is required in order to license a relative clause. If this line of reasoning is correct, the example (c) will be ruled out since an empty D with a non-mass singular would violate (18)a. of the text, examples (e) and (i) will certainly contain such a null determiner and (g) will contain it optionally. Similar conclusions about the possibility of empty Ds with predicates can be drawn from the following sentences:

- (k) Ritengo Mario \*(un) bravo medico  
I believe Mario (a) good doctor
- (l) Ritengo Gianni e Mario (dei) bravi medici  
I believe Gianni and Mario (*partit.art.*) good doctors

such a category is actually a head D, its presence may also suffice to explain the otherwise unmotivated restrictions to plural/mass nouns and to the existential reading, which do not arise in the case of sentences like (17) or other non-argument (e.g. vocative) usages. In fact, the empty D could instantiate some sort of existential operator and as such impose constraints as to the count/mass interpretation of the head nouns it quantifies over (cf. section 5 below for discussion): analogous is, after all, the behavior of certain overt existential determiners, like e.g. the mentioned partitive article.

On the grounds of all of this and abstracting away from the marginal and peculiar cases of the type of (12)c. we will make the assumptions in (18) and revise (11) into (19):

- (18) Empty determiners may occur at S-structure in Italian only under the following conditions:
- a) they are restricted to plural or mass head nouns like several other determiners
  - b) are subject to a lexical government requirement like other empty heads <sup>12</sup>
  - c) receive the indefinite interpretation of an existential quantifier unspecified for number and taking the narrowest possible scope (default existential) <sup>13</sup>

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with certain adjectivally modified predicates headed by count nouns, an overt determiner is sometimes obligatory in the singular, but not in the plural, suggesting that a D category may always be required, remaining empty just in the plural, as expected given (18)a.

<sup>12</sup> We assume, on the analogy of the mentioned conditions on the distribution of null Cs, that such a government requirement on the empty head D is satisfied by lexically governing its whole maximal projection, provided that specifiers and heads of phrases are accessible to external governors (cf. Chomsky 1986b among others). It is possible that in addition to lexical head government, the licensing of such empty Ds is subject, as for other categories, to an identification requirement which could only be satisfied under a local relation with a number agreement morpheme. Since, according to Delfitto and Schrotten (1991), such a morpheme would not be available in Modern French, this hypothesis would be one possible way to build their insights about the lack of bare nouns in French into the present framework.

<sup>13</sup> Even the generalizations stated in (18) are not immune from relevant exceptions, which essentially fall into two categories: first, there are determinerless nouns occurring with a modification (usually an AP, on either side of the N, a PP or a relative clause), which are able, at a particularly narrative stylistic level, to violate (18)b., i.e. to surface in preverbal subject position:

- 
- (a) Meravigliose foreste/Foreste meravigliose si aprivano davanti ai nostri occhi  
Beautiful forests opened in front of our eyes
  - (b) Ragazze delle più varie origini affollavano i marciapiedi tra Rue St.Denis e Boulevard Sébastopole  
Girls of the most varied origins crowded the sidewalks between Rue St.Denis and Boulevard Sébastopole
  - (c) Ragazze che Gianni non aveva mai visto affollavano i marciapiedi tra...  
Girls that Gianni had never seen crowded the sidewalks between...

Similarly, modified bare plurals may become acceptable in postcopular argument position:

- (d) La causa delle rivolte sono spesso marocchini che non vogliono tornare a casa  
The cause of the riots are often Moroccans who don't want to go back home

It must be clearly noticed, however, that such expressions never violate generalizations (18)a. and (18)c.: they cannot occur with a singular count head or receive the equivalent of the definite generic interpretation, i.e. the one compatible with a kind or stage level predicate and with the occurrence in object position (cf. fn. 7 above):

- (e) \*Meravigliosa foresta si apriva davanti ai nostri occhi  
Beautiful forest opened in front of our eyes
- (f) \*Foreste tropicali sono estinte  
Tropical forests are extinct
- (g) Vaste foreste tropicali furono distrutte dal cataclisma  
Large tropical forests were destroyed by the cataclysm
- (h) Ho sempre studiato foreste tropicali  
I have always studied tropical forests

(g) and (h) are grammatical but only tolerate an existential interpretation, the generic one being attainable just through the occurrence of a definite subject phrase:

- (i) Le vaste foreste tropicali furono distrutte dal cataclisma  
The large tropical forests were destroyed by the cataclysm
- (j) Ho sempre studiato le foreste tropicali  
I have always studied the tropical forests

Instead, like the other indefinite determiners discussed in fn.7 (e.g. the singular indefinite article and the partitive one), in subject position of non-collective individual level predicates, the empty D of such bare nouns may assume what we referred to as the indefinite generic reading:

- (k) Foreste di tali dimensioni sono ormai difficili da trovare  
Forests of that size are now hard to find

There exists, on the other side, also a class of more radical exceptions to (18) as a whole, thus violating all the generalizations stated in the text: such a class is constituted by coordinate conjoined nouns, as in the following examples:

- (l) Cane e gatto si erano già addormentati  
Dog and cat had already fallen asleep
- (m) Cane e gatto sono sempre nemici  
Dog and cat are always enemies

Roughly similar is the judgment in cases of disjunctive coordination:

- (n) O cane o gatto dovranno essere messi in isolamento  
Either dog or cat will have to be put in isolation

In (l) and (n) a definite specific reading is readily available for the coordinated nouns, in (m) the generic reading is perfectly acceptable. As for the first class of exceptions, namely those only violating (18)b., one possibility is that the presence of a modification of the head noun suffices to supply some abstract features into the empty D position, which enable it to escape from the lexical government requirement, roughly in the same sense as pronominal empty categories (PRO/pro) do, according to Chomsky (1981,1982). This possibility appears to be independently necessary to account for other structures, at least in English, which will be mentioned in fn. 26 below. Although several variants of this idea and other potential solutions are conceivable and worth exploring, we cannot discuss them here (cf. also Delfitto and Schroten 1991). The second type of exceptions is more mysterious and is likely to

(19) A ‘nominal expression’ is an argument only if it is introduced by a category D

It is obvious how (19) also overcomes the conceptual shortcoming of (11) pointed out on page 6 above, by eliminating reference to the content of the D position.

Since the capacity for reference or quantified interpretation is a typical ingredient of argumenthood, if something like (19) is correct, the conclusion in (20) will become quite plausible:

(20) Reference and quantification (therefore, among other things, the determination of properties like the semantic import of grammatical number) are properties of the D position

We have already observed that an empty (therefore, morphologically unspecified for number) D may yield semantic indeterminacy between singular and plural denotation despite of the plurality of the head noun. But stronger evidence in support of this point is provided by pairs like the following:

- (21) a. La mia segretaria e tua collaboratrice sta/\*stanno uscendo  
The my secretary and your collaborator is/are going out  
b. La mia segretaria e la tua collaboratrice stanno/\*sta uscendo  
The my secretary and the your collaborator are/is going out<sup>14</sup>

In (21)a. two morphologically singular nominal projections are coordinated excluding the determiner, which remains unique and is also morphologically singular: here the whole subject argument of the clause is understood as denoting a single individual, as is clarified by the verbal agreement. In (21)b., instead, the coordination includes the determiners, one for each conjunct, and the denotation of the argument is

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presuppose a deeper structural analysis of coordinate constructions; however, a possible line of explanation might suggest that, if what is required in order to turn a nominal phrase into an argument is some functional head position triggering reference or quantification, such a position can be provided not only by a D but also by coordinating elements, understood essentially as quasi-operators giving rise to a quantificational structure.

<sup>14</sup> It is still necessary to rule out structures with one plural determiner and several singular coordinated head nouns:

- (a) \*Le mia segretaria e tua collaboratrice  
The(plural) my secretary and your collaborator

Rather than through a theory of argumenthood, we may suggest that such examples can be excluded by means of a condition requiring morphological agreement between the features of the determiner and those of each of the head nouns. On certain properties of this condition and its crosslinguistic generality cf. also fn. 25 below.

obligatorily understood as plural. In other words, irrespectively of the cardinality of head nouns present, a single singular determiner is sufficient to impose singular denotation to the entire nominal expression, while the sum of two singular determiners automatically imposes plural denotation.

### 3. Proper names

If it is really the D position which turns a nominal expression into an argument, an obvious question arises concerning those proper names (in particular names of individuals, cities and certain ‘small’ islands<sup>15</sup>, companies, days and months) which are allowed in Italian to occur freely in argument function without any determiner: it is rather clear that they cannot be introduced by an empty D, since the properties of the latter, as identified in (18), seem to be inapplicable in the case of proper names. For a proper name like *Gianni* in sentence (22)a. below, for example, is neither understood as denoting a mass, nor is plural, it does not receive an indefinite interpretation and, in addition, may occur in a lexically ungoverned position<sup>16</sup>.

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<sup>15</sup> That such ‘smallness’ is a cultural, rather than purely geographic, concept is argued in Longobardi (1987), where it is claimed that names of cities and ‘small’ islands, as opposed, say, to countries and ‘large’ islands, form a natural syntactic class also from another point of view. In fact, even though the need for the article which characterizes names of countries and ‘large’ islands in argument position disappears for unclear reasons in locative and motional PPs, the choice of the head P is different in such cases for cities and ‘small’ islands:

- (a) Abbiamo visitato \*(la) Francia/Sicilia  
We visited France/Sicily
- (b) Siamo stati in/\*a Francia/Sicilia  
We were in/\*at France/Sicily
- (c) Abbiamo visitato (\*la) Parigi/Lampedusa  
We visited (\*the) Paris/Lampedusa
- (d) Siamo stati a/\*in Parigi/Lampedusa  
We were at/\*in Paris/Lampedusa

Thus, the alternation between *a* and *in* appears to single out essentially the same two classes of geographic names as the presence and the lack of the article. It is unclear, however, whether a direct syntactic link between the two phenomena may be established.

<sup>16</sup> Another sharp semantic difference between bare (common) nouns and proper names arises in the domain of scope facts. We have briefly mentioned Carlson’s observation, reproducible in Italian, that bare nouns are forced to take the narrowest possible scope, in particular with respect to negation and intensional context (i.e. they are read *de dicto*):

- (a) Non ho incontrato studenti  
I did not meet students  
‘There are no students such that I met them’  
‘\*There are some students such that I did not meet them’
- (b) Vorrei incontrare studenti  
I would like to meet students  
‘I would like for there to be some students such that I could meet them’

The theoretical framework so far defined provides a restrictive and almost inescapable answer to this problem: a D position introducing the subject argument must be syntactically present in a sentence like (22)a. and cannot be empty, thus the only possible candidate to occupy such a D position is the proper name itself. To consider yet another way to formulate essentially the same problem, recall that several Romance varieties display free or stylistically conditioned alternations between the presence and the absence of the article with proper (first or last) names of human beings:

- ( 22) a. Gianni mi ha telefonato  
Gianni called me up  
b. Il Gianni mi ha telefonato  
The Gianni called me up

In some cases the alternation is also semantically conditioned; for instance, with last names of female human beings the use of the article in standard Italian is virtually obligatory:

- ( 23) La Callas/\*Callas ha cantato  
The Callas/Callas sang

The natural question which arises here, although it has never been raised so far, is whether *Gianni* of (22)a. occupies the same S-structure position as *Gianni* in (22)b. or rather the position of *il* of (20)b. As we have noticed, the set of assumptions motivated in the previous section forces us to adopt the latter hypothesis and suggests the existence of a transformational relation between the pair of sentences in (22), established through movement of *Gianni* in (22)a. In fact, now it becomes necessary to assume that such Ns as those proper names which occur in argument function without any overt determiner have undergone raising from  $N^0$  to  $D^0$ , in order for the structure to comply with (18)-(19). This is so because they must be base generated in

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\*There are some students such that I would like to meet them'

In the same contexts, however, proper names normally give up the narrow scope restriction: in fact, they even strongly favor the wide scope (*de re*) existential reading. The actual existence of Maria seems in fact to be implied by the utterance of either (c) or (d):

- (c) Non ho incontrato Maria  
I did not meet Maria  
(d) Vorrei incontrare Maria  
I would like to meet Maria

For further remarks on this crucial property of proper names, cf. section 5. below in the text.

the N<sup>0</sup> position and optionally allowed to remain there, to account for those cases in which they occur introduced by an article. This hypothesis, put forth on theoretical grounds, turns out to receive straightforward empirical confirmation from a curious and subtle paradigm of certain Romance varieties, which it contributes to explaining.

In fact, to determine the exact location of a lexical item choosing one out of two possible structural positions in the tree, it is often useful to insert some visible material between them in order to visualize the abstract linear order; for example, Emonds (1978) and Pollock (1989) relied on interpolation of adverbs and negation to establish that the tensed lexical verb of (24)b. in French occupies the same position as the inflected auxiliary and not as the past participle in (24)a.:

- (24) a. Il n'a pas parlé  
          He did not speak  
      b. Il ne parle pas  
          He does not speak

We will try to reproduce an argument in the same vein for the positions N and D. Notice, first, that Italian adjectives, both possessive and non-possessive ones, may occur in prenominal position between D and N, or in postnominal position, but never before D with either common or proper names<sup>17</sup>:

- (25) a. \*Mio il Gianni  
          My the Gianni  
      b. \*Vecchio il tavolo  
          Old the table

Now, consider the following paradigm:

- (26) a. Il mio Gianni ha finalmente telefonato  
          The my Gianni finally called up  
      b. \*Mio Gianni ha finalmente telefonato  
          My Gianni finally called up  
      c. Gianni mio ha finalmente telefonato  
          Gianni my finally called up  
      d. Il Gianni mio ha finalmente telefonato  
          The Gianni my finally called up

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<sup>17</sup> In Italian, the distributional properties of possessives are essentially those of predicative adjectives. For a discussion cf. Cinque (1990 and forthcoming) and Giorgi and Longobardi (1991, ch.3).

the double possibility of surface ordering (AN or NA) is preserved when the proper name, here in a typical referential position, is introduced by the determiner, but an unexpected gap in the paradigm appears with articleless names: in fact, while many varieties, especially in the Center and the South of Italy, accept (26)c., none accepts the sentence in (26)b. which results into very severe ungrammaticality. The generalization appears to be that the lack of the article forces an N-initial order. This otherwise surprising idiosyncrasy becomes immediately understandable assuming that the proper name needs to move from N<sup>0</sup> in order to fill in the empty D<sup>0</sup> position, thus crossing over the adjective presumably lying in its Spec. There is also an interesting piece of semantic evidence in favor of this hypothesis, in particular of the assumption that the possessive AP of (26)c. does not follow the N<sup>0</sup> position and has become postnominal only as the result of an N-preposing process: notice that normal postnominal possessives tend to be strongly contrastive in Italian, as is the case e.g. for *mio* in (26)d., which can only be interpreted with contrastive reference to the existence of another salient Gianni in the domain of discourse who is not ‘mine’, i.e. is related to someone else. This interpretation is not required, instead, by prenominal possessives, like the one in (26)a., which can be perfectly understood as an affective expression in an environment where no other Gianni’s existence is presupposed. Now, the interpretation of *mio* in (26)c. does not need to be contrastive, exactly like that in (26)a. and contrary to that in (26)d. This may be explained on the grounds of the general fact that contrastiveness is uniformly required of posthead possessives but not of those in SpecNP and of the crucial hypothesis that it is *Gianni* that moved in (26)c., crossing over *mio*.

The paradigm above can be exactly reproduced with certain non-possessive adjectives<sup>18</sup>; here are two examples with a family name and a city name as raising heads:

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<sup>18</sup> Even in the ‘liberal’ varieties of Central and Southern Italy not all adjectives allow the raising of the head noun: indeed, modification by most types of adjectives blocks the movement and imposes the use of the article also with proper names. Actually, it seems that the adjectives which tolerate the raising of their head nouns at best are those few that are able to receive a restrictive interpretation even in prenominal position (a possibility usually barred for the majority of Italian adjectives): namely possessives, adjectives like *vecchio* ‘old’, *giovane* ‘young’, *antico* ‘ancient’, *solo* ‘only’ (which will be discussed in more detail in the next footnote), and numeral ordinal adjectives. For it is plausible that an idiomatized version of N-raising lies at the basis of the usage of names of monarchs and popes followed by an ordinal adjective: for ordinal adjectives obligatorily occur in prenominal position except with such nouns when articleless. Cf., for example, the alternation in the following pair:

- (a) Napoleone terzo fu l’ultimo Imperatore dei Francesi  
Napoleon [the] third was the last Emperor of the French
- (b) Il terzo Napoleone/\*Il Napoleone terzo computato nella dinastia si chiamava in realtà Luigi Bonaparte

- (27) a. E' venuto il vecchio Camerese  
Came the older Camerese
- b. \*E' venuto vecchio Camerese  
Came older Camerese
- c. E' venuto Camerese vecchio  
Came Camerese older
- d. E' venuto il Camerese vecchio  
Came the Camerese older
- (28) a. L'antica Roma fu la città più importante del Mediterraneo  
The ancient Rome was the most important city of the Mediterranean
- b. \*Antica Roma fu la città più importante del Mediterraneo  
Ancient Rome was the most important city of the Mediterranean
- c. Roma antica fu la città più importante del Mediterraneo  
Rome ancient was the most important city of the Mediterranean
- d. La Roma antica fu la città più importante del Mediterraneo  
The Rome ancient was the most important city of the Mediterranean <sup>19</sup>

Finally, also names of months and days repropose an analogous pattern of behavior:

- (29) a. Lo scorso giovedì/Natale/maggio è stato un giorno/mese terribile  
The last thursday/Christmas/May was a terrible day/month
- b. \*Scorso giovedì/Natale/maggio è stato un giorno/mese terribile  
Last thursday/Christmas/May was a terrible day/month

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The third Napoleon/ The Napoleon third numbered in the dynasty was actually named Luigi Bonaparte

More generally, it appears that with all other adjectives raising of the head noun is totally incompatible with any appositive reading and can only be marginally tolerated even with a restrictive and sharply contrastive interpretation of the adjective itself: e.g. *Gianni simpatico* 'Gianni nice' can be very marginally accepted only if the speaker and hearer agreed in advance to define the individual referred to that way in contrast to another, less nice, Gianni.

<sup>19</sup> The adjective *solo* (masc. sing., but regularly inflected for gender and number: *sola*, *-i*, *-e*, and not to be confused with the homophonous but uninflected adverb meaning 'only, just': cf. Longobardi 1986 for some remarks), in one of its readings (i.e. when equivalent to 'only, unique'; in the other reading it means 'alone'), provides a further strong argument for N-raising. In fact, when used with a proper name introduced by an article, an inflected form of *solo* can only occur prenominaly, since a postnominal occurrence necessarily displays the 'alone' meaning:

- (a) La sola Maria si è presentata  
The only Maria showed up  
'Only Maria....'

- c. Giovedì/Natale/maggio scorso è stato un giorno/mese terribile  
Thursday/Christmas/May last was a terrible day/month
- d. Il giovedì/Natale/maggio scorso è stato un giorno/mese terribile  
The thursday/Christmas/May last was a terrible day/  
month 20

- 
- (b) La Maria sola si è presentata  
The Maria alone showed up  
'The Maria who is (notoriously) alone....'

Correspondingly, this behavior is displayed also in some constructions with common nouns:

- (c) La sola ragazza presente era antipatica  
The only girl present was dislikeable
- (d) La ragazza sola presente era antipatica  
The girl alone present was dislikeable

now, if the article is removed from the proper name, the order A+N becomes totally impossible and the N+A one comes to display the same meaning as (a) and not as (b):

- (e) \*Sola Maria si è presentata  
Only (inflected for fem. gender) Maria showed up
- (f) Maria sola si è presentata  
Maria only (inflected for fem. gender) showed up

Thus, this can be taken as a typical manifestation of the raising paradigm discussed in the text. Notice, finally, that, were *sola* not inflected for feminine gender in (e), the structure would be irrelevantly grammatical, since, as we noticed, the masculine singular form *solo* is homophonous with the adverbial form which can always be prefixed (or suffixed) to any DP.

20 The paradigms in (28)-(29) are particularly important since the judgments on them are shared by speakers of all varieties of Italian, not just of the Central and Southern ones, and some can be reproduced also in other Romance languages such as French, Catalan and Spanish. This confirms the plausibility of a raising analysis of determinerless proper names throughout Western Romania. It seems, anyway, that the phenomenon of raising to D, in addition to a large portion of proper names, concerns also a few special common nouns. In Italian they fall into two classes: first, there is a subset of kinship names, essentially the same as can be most commonly used in the vocative:

- Papà/Mamma  
(a) { Nonno/-a } (mio/-a) verrà a trovarmi  
Zio/-a

- Dad/Mom  
{ Grandpa/Grandma } (my) will visit me  
Uncle/Aunt

- Padre  
Madre  
Fratello  
Sorella  
(b)\*{ Cugino/a } (mio/-a) verrà a trovarmi  
Figlio/-a  
Moglie  
Marito  
Cognato/-a  
Suocero/-a

Father



Notice further that the fact that the same paradigms appear in both lexically governed and non-lexically governed positions (cf. egs. (27) and (28)) confirms that filling the empty D by means of the raised proper name is necessary not just for syntactic reasons but also and primarily for semantic ones, i.e. to avoid an inappropriate quantified interpretation of the latter position (i.e. with the consequence of a mass and indefinite reading of the whole nominal).

Thus, if our explanation for the paradigms discussed above is correct, the obligatoriness of the N-initial order in the articleless examples is a consequence of the fact that argument nominals need to be introduced by a D position and that such a position cannot be left empty at S-structure, if we do not want to derive the existential interpretation mentioned above which would be incorrect here and anyway should not concern a singular non-mass noun like *Gianni*. As a result, the framework we have developed makes another prediction about the behavior of adjectives and proper names, namely that the obligatoriness of the N-initial order may disappear with nominals in non-argument function, e.g. vocative or predicative, which were shown to be realizable through a bare NP and not necessarily through a DP:

- (30) a. Mio caro Gianni, vieni qui!  
           My dear Gianni, come here  
       b. Gianni mio caro, vieni qui!  
           Gianni my dear, come here! 21

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The basic descriptive generalization appears thus to be that raising of such common nouns to D is possible only if they discharge a  $\Theta$ -role to be realized on an implicit or overt genitive argument.

21 While (30)a. is likely to contain just a bare NP, the structure of (30)b. is potentially ambiguous between an NP with postnominal APs and a DP with prenominal APs and raising of *Gianni*. If DPs are really allowed to occur as vocatives, the question arises of how to exclude the use of the definite article in vocative DPs, even in dialects accepting *il Gianni* in argument function:

- (a) \*Il Gianni, vieni qui!  
           The Gianni, come here!  
       (b) \*Il ragazzo, vieni qui!  
           The boy, come here!

Given that at least the Tuscan variety, and from this, literary Italian accept vocatives introduced by a demonstrative determiner or by the special particle *o* (cf. also *a* in the dialect of Rome), it is conceivable that the latter are realizations of the vocative Case in the D position:

- (c) Quei ragazzi, venite qui!  
           Those kids, come here!  
       (d) O Gianni, vieni qui!  
           Vocative particle Gianni, come here!

Accordingly, other determiners (*il, un, etc.*) would not be endowed with any form realizing vocative Case. Of course, such an idiosyncratic account of the

- (31) a. Si è mascherato da vecchio Camerese  
 He disguised himself as old Camerese  
 b. Si è mascherato da Camerese vecchio  
 He disguised himself as Camerese old <sup>22</sup>

as suggested by these data, the prediction turns out to be correct, supporting the entire framework and explaining phenomena which would be hard to capture in an equally principled way by means of alternative approaches.

The evidence of this section, thus, argues for the existence of N-movement to D, and consequently in favor of the structure (2), in Italian and probably in other Western Romance languages as well. <sup>23</sup> Once we adopt (2), the natural way of reformulating the content of principle (19) above becomes the following (cf. also Stowell 1989):

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ungrammaticality of (a)-(b) leaves open the theoretical possibility that similar structures may turn out to be more acceptable in some other Romance variety.

<sup>22</sup> As was the case for (30), also (31)a. can only contain an NP, whereas in (31)b. the predicate may either be a DP or an NP. Correspondingly, a difference in interpretation arises: (31)a. may only have a *de dicto* or opaque reading of the predicate: it cannot imply the existence of any specific old Camerese, but just expresses the concept of how a member whosoever of such a family might look like as an old man. Instead, (31)b., in addition to the previous reading, may be used to convey the meaning that there exists a specific old man of the Camerese family and that the subject was trying to disguise himself precisely as such a man: this is a *de re* or transparent reading. In fact, it appears more generally that the possibility of displaying a transparent reading in intensional contexts is normal for DP predicates and excluded for bare NPs:

- (a) Gianni vorrebbe essere il figlio di Maria  
 Gianni would like to be the son of Maria  
 (b) Gianni vorrebbe essere figlio di Maria  
 Gianni would like to be son of Maria

Sentence (a) may imply that there does exist one (and only one, in the relevant domain of discourse) son of Maria's, with his specific other properties which Gianni would like to enjoy, whereas (b) seems just to convey the meaning that Gianni would like to have Maria as his own mother. For instance, if *Paolo* is the name of Maria's actual son, then, in one reading, (a), but not (b), could be synonymous with (c):

- (c) Gianni vorrebbe essere Paolo  
 Gianni would like to be Paolo.

<sup>23</sup> For the sake of simplicity, we are presenting a structure where D takes NP as its direct complement. However, the analysis here proposed is perfectly compatible with (and, in a sense, can be viewed as an abstraction from) more complex structures such as those proposed by Cinque (1990 and forthcoming) and Picallo (1990), and advocated then by Valois (1991), Bernstein (1991b) and Crisma (1991), in which intermediate functional heads with their projections occur between D and N (see also Battye 1989 for an analogous structure in Italian). In this case it is likely that raising of N to D must take place in obligatory successive cyclic steps, observing Travis' (1984) Head Movement Constraint, and, as a consequence, that languages lacking evidence for visible movement of N to such intermediate heads should also be expected to lack evidence of visible raising to D. For instance, this will appear to be the case in English

(19') DP can be an argument, NP cannot

Consider in this light the question of the syntactic licensing of NPs; having distinguished between NPs and DPs and having argued for the structure in (2) above, we must now provide for the licensing of such categories under Chomsky's (1986a) Full Interpretation Principle. According to Chomsky, who follows Rothstein (1983) (cf. also Rothstein 1990), maximal projections, apart from operators, can either be licensed as arguments or as predicates. DP can certainly be licensed as an argument in most cases, as we have seen, or as a predicate in others, e.g. many copular or small clause constructions. <sup>24</sup> Instead NP was shown not to be able to assume argument function if not introduced by an overt or empty determiner, i.e. if not the complement of a D position. This fact suggests that in a structured utterance (i.e. except from use in isolation, as in vocative and exclamatory expressions) NP can only be licensed through a predicative interpretation. We propose, then, that NP can be predicated of the head selecting it, namely of a D.

With these conclusions in mind, let us now consider certain properties of the corresponding structures of English.

#### 4. Italian and English

The surprising patterns of the preceding section and some of its semantic properties can thus be shown to follow with no additional stipulation just from the  

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and the other Germanic languages, according to the analysis proposed in section 6. below.

<sup>24</sup> In Italian there are also some environments in which predicates cannot be realized as DPs, but just as bare NPs. In apposition to an argument and in primary predication both options are often available:

- (a) Maria è (la) figlia di un generale  
Maria is (the) daughter of a general
- (b) Gianni, (il) nostro ex professore di linguistica, è diventato (il) preside della facoltà  
Gianni, (the) our former professor of linguistics, became (the) dean of the faculty

but in secondary predication and in a dislocated position only NP is possible:

- (c) Gianni è tornato a casa (\*il) preside della facoltà  
Gianni went back home (the) dean of the faculty
- (d) (\*La) figlia di un generale, Maria riusciva solo a innamorarsi di uomini in divisa  
(The) daughter of a general, Maria could only fall in love with men in a uniform

The *rationale* of such distribution and the differences with English which arise numerous in these paradigms are in special need of future investigation.

head raising hypothesis. The latter, however, cannot be immediately extended to proper names in English, since they, even occurring without an article, may be modified by a prenominal adjective and cannot by a postnominal one:

- (32)a. Old John came in
- b. \*John old came in

Is it conceivable that structures like English (32)a. do not contain any D or DP? In other words, is it possible that English lacks (19') at all? This conclusion appears to be rather odd, since it would suggest a deep interpretative difference between Italian and English nominal constructions, despite of their wide range of syntactic and semantic similarities. Furthermore, Stowell (1989) arrived at a formulation similar to (19'), as we have said, precisely from the study of English. Finally, it seems that (20), which we took as a consequence of (19), is supported in English by arguments in part analogous to those which supported it in Italian. In fact, Carlson (1977a) had already made, for English, remarks similar to the ones provided by Benincà about the neutrality of bare plurals with respect to singular/plural reference; also the facts presented in (21) can be reproduced in English, although their analysis presents some independent complications:

- (33)a. The secretary and friend of John Smith is/?are coming
- b. That secretary and friend of John Smith is/\*are coming

For some speakers of English both versions of (33)a. are in fact acceptable, although the second seems to be more marginal: we may propose that such extended acceptance on the part of many speakers, i.e. such referential ambiguity of the subject phrase, is to be attributed precisely to the fact that, unlike the Italian one, the English definite article is a determiner morphologically neutral between singular and plural <sup>25</sup>: when an unambiguously singular determiner is used, in fact, as in (33)b., the expected 'Italian' pattern tends to emerge more clearly. Thus, the examples of (33) seem to provide a certain support for some version of (20) and in turn for (19), suggesting their validity in English as well <sup>26</sup>.

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<sup>25</sup> This account of the marked acceptability of the plural reading of (33)a. supposes that the agreement requirement between D and each head N, mentioned in fn. 14 above, is satisfied by just formal non-distinctness of the morphological features of the article and the nouns, always leaving *the* the possibility of being assigned a plural semantic content.

<sup>26</sup> A wide class of apparently determinerless nominal arguments is represented in English and other Germanic languages by nouns introduced by a genitive phrase with 's (for whose nature in the different Germanic languages cf. Giorgi and Longobardi

Given such results, it appears more promising to assume that, as a consequence of (19), an empty determiner is present in English (32)a. and that it is then principle (18), namely the licensing condition for null Ds, which is apparently relaxed in English <sup>27</sup>. Before starting to consider why this should be the case, let us notice that a number of other constructions in English involve superficially determinerless nominals which are unacceptable in the closely corresponding Romance examples.

First of all, in English many proper names requiring the article in Romance occur with no surface determiner, yet the position of adjectives indicates that no head raising has taken place:

- (34) a. Amo \*(la) dolce Francia  
           I love (the) sweet France  
       b. I love sweet France

second, in English, bare plurals and bare mass nouns occur syntactically and semantically rather unrestricted, while we have noticed that in Romance, when possible at all (French essentially does not allow them), they may survive just in

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1991). The fact that these genitive phrases are always absolutely initial in the nominal construction (in particular, they precede all adjectives) and mutually exclusive with essentially every determiner leads to the hypothesis that they surface in the Spec of DP and impose their own features to D via Spec-Head agreement. Such features on D should suffice to license a definite interpretation preventing lexical insertion of a real determiner and freeing the empty position from the effect of any government requirement. Perhaps the same structure and similar effects can be attributed to possessive pronouns of the determiner-like type discussed in Giorgi and Longobardi (1991), such as we find not only in Germanic but also in French or Spanish. In fact, all these genitives phrases are essentially maximal projections  $\Theta$ -related to the head noun: therefore, they must originate within the NP and cannot raise to an  $X^0$  position like D but just to an XP position such as the Spec of DP.

The important correlation between raising of the genitive phrase to an initial position (Spec of DP, we have argued) and its ability to play a definite determiner function is suggested also by some diachronic data, studied in Marzolla (1991); she shows that, unlike modern Germanic languages, Old High German had AP modifiers precede genitive phrases in pre-N position and that correspondingly the latter could never assume determiner function.

<sup>27</sup> A sophisticated but convincing argument for the existence of more empty Ds in English than are possible in Italian comes from the semantic analysis of the gloss of example (31)a. above, repeated here:

- (a) He disguised himself as old Cameresei  
 not only is this sentence grammatical in English, but it also displays a transparent reading of the predicate. Provided that the following pair of English  
 (b) John would like to be professor of mathematics at Yale  
 (c) John would like to be the professor of mathematics at Yale

reproduces the same contrast as found in the Italian corresponding structures of fn. 22, we may conclude that in English as well the transparent reading is limited to DP predicates: therefore *old Cameresei* in (a) must be a DP and, since the head D cannot be occupied by *Cameresei* raised, it must be empty.

lexically governed contexts and only have the existential reading (and not the generic one); as for the first point, consider the following contrasts:

- (35) a. \*Castori costruiscono dighe  
Beavers build dams  
b. \*Cani stavano seduti sul mio prato  
Dogs were sitting on my lawn

as an illustration of the second point, notice that the following English sentence ambiguously corresponds to two distinct translations in Italian:

- (36) I only excluded old ladies  
A) Ho escluso solo vecchie signore  
B) Ho escluso solo le vecchie signore

the A) translation, which is literal, i.e. with no article, only has an existential reading (some old ladies have been excluded, but some can have been admitted), whereas B), with the definite article, is specialized for the generic one (in principle, all old ladies have been excluded). Of course, (36)B) also displays the definite *specific* reading, not relevant here. Such examples as English (36) are important since they appear to undermine the widespread belief that the existential and generic readings of bare nouns *always* occur in complementary distribution (cf. also Diesing 1989). However in some cases they actually do. Accordingly, the following contrast in Italian (and the lack of a corresponding contrast in English) appears to descend from the same distinction:

- (37) Ho trovato /\*Amo buon vino e arance fresche  
I found / I love good wine and fresh oranges

the single event verb *found* (essentially a stage level predicate in the sense of Carlson 1977a, Kratzer 1988, Diesing 1988, 1989) favors an existential reading of the object, while the permanent state verb *love* (an individual level predicate) forces the generic one, incompatible with bare nouns in Italian. Restoration of the article, in fact, also restores grammaticality, along with the generic reading, in the second Italian example 28.

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<sup>28</sup> Given the discussion of fn. 13 above, it follows that, in subject position of an individual level non-collective (i.e. non-kind level) predicate, the bare noun of a language such as English neutralizes two generic interpretations, the definite and indefinite one, which are overtly distinct in Romance (and in principle it might be so also in other Germanic varieties: cf. fn. 51 below):

(a) Beavers of this type never build dams

As a further difference, recall that not only is it the case that English may drop the article in constructions where the Romance languages cannot (generics and certain proper names), but also that it has to:

- (38) a. \*I love the France <sup>29</sup>  
b. \*The beavers are mammals  
c. \*The wine is made out of grape

Finally, it must be noticed that, strikingly enough, English turns out to be exactly like Romance, i.e. to require the article, in the case of generic ‘substantivized adjectives’, that is arguments consisting of an adjective without an overt nominal head:

- (39) a. The rich are becoming even richer

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(b) Water of that color can rarely be drunk  
One interpretation should result from the conversion of the normally existential reading of certain indefinite structures into generic quantification over sets, as in Italian (cf. fn. 7 above):

- (c) (Dei) castori di questo tipo non costruiscono mai dighe  
(*Partit.art.*) beavers of this sort never build dams  
(d) (Dell’)acqua di quel colore raramente può essere bevuta  
(*Partit.art.*) water of that color can rarely be drunk

the other interpretation, hardly distinguishable from the former one, should correspond to the Italian form with the definite article:

- (e) I castori di questo tipo non costruiscono mai dighe  
The beavers of this sort never build dams  
(f) L’acqua di quel colore raramente può essere bevuta  
The water of that color can rarely be drunk

The structure of English corresponding to the latter Italian forms is the one which is likely to underlie the generic usage of bare nouns in object position and in subject position of kind level and stage level predicates, i.e. in the environments where the generic conversion of indefinite structures such as those of (c)-(d) is not acceptable in Italian.

<sup>29</sup> Although an independent, lexico-semantic definition of proper name is difficult, it would be desirable to be able to claim that all proper names of English, apart from the plural ones, which will be dealt with in the next section, drop the article; this is especially true in the light of the consideration that no proper name of individuals ever takes the article: in other words, no dialect of English appears to admit of anything like *il Gianni*. However, some exceptions arise at least in the case of geographical names; they concern e.g. names of rivers and lakes:

- (a) The Potomac  
(b) The Ontario

In such cases the use of the article is both possible and required. A possible speculation about the contrast of such names with those of cities and countries, like *Paris* or *France*, may rely on the fact that to the former it is always possible to add the corresponding common noun, which would be unacceptable with the latter:

- (c) The Potomac river  
(d) The lake Ontario

Thus, perhaps, the cases of (a) and (b) could be thought of as containing a sort of understood common noun licensing the article.

- b. \*Rich are becoming even richer  
(cf. instead 'Rich people are becoming even richer')

On the basis of these paradigms we must conclude that English both allows and requires the occurrence at S-structure of empty determiners with properties radically different from those of the Italian one. Although correct, this stipulation is, as such, highly unsatisfactory: the parametric variation is stated in a rather idiosyncratic way, it forces us to give up any possible claim to the generality of the default existential interpretation for null Ds, and it leaves with no explanation the lack of lexical government effects in English and the apparently exceptional behavior of generic substantivized adjectives. In the next sections we are going to develop a more principled parametric account of these phenomena. Before doing so, we must first provide a theoretical answer to some questions which are equally raised by the pattern of nouns and determiners in all the Romance and Germanic languages.

#### 5. Some crosslinguistic generalizations

The first question to be raised stems naturally from recognizing the following generalization, which appears to hold very extensively, perhaps generally, across Romance and Germanic: the only nouns in argument function which are allowed to appear in S-structure without any overt determiner are proper names, pronouns, plurals, and singular mass nouns. In other words, singular count nouns are always excluded:

(40)a. Ho trovato Gianni  
I found Gianni

b. Ho trovato lui  
I found him

(41)a. Ho trovato amici  
I found friends

b. Ho trovato acqua  
I found water

c. \*Ho trovato amico  
I found friend

Why should it be so? Actually, it must be pointed out that it is not the case that all singular nouns which allow a count interpretation are literally excluded from the

articleless construction: they are acceptable if their intrinsic meaning and the lexical environment tolerate a mass interpretation. Thus, the difference in interpretation between the following sentences

- (42) a. I ate beaver  
b. I ate a beaver  
c. I ate beavers

is that in (42)a. the object nominal quantifies over the potentially infinite set of subparts of the mass 'beaver meat', singling out an indefinite number of them, in b. and c. it quantifies over the set of individuals who are 'beavers', singling out just one or again an indefinite number of them, respectively. In other words, unlike articles, demonstratives, and such determiners as *every* or *each*, the empty determiner of the Romance and Germanic languages seems to impose quantification over subparts and exclude the one over individuals whenever the head noun following it is in the singular. As we have anticipated, this property of the empty determiner is not isolated in the class of determiners, but is shared by many of the overt ones, most importantly by its closest correspondent, namely the partitive article '*di* + definite determiner' of Italian; but consider also for example the behavior of Italian *molto/-a/-i/-e* 'a lot of' (inflected for gender and number in agreement with the head noun):

- (43) a. Ho trovato molti amici  
I found a lot of friends  
b. Ho trovato molta acqua  
I found a lot of water  
c.\*Ho trovato molto amico  
I found a lot of friend

Therefore, the situation can be described as follows: determiners are semantically understood as operators binding a variable, whose range is always a potentially infinite set, i.e. the linguistically natural kind defined by the meaning of the head noun: in the plural form all common nouns define a potentially infinite set of individual entities (say, the kind of all friends or beavers etc.); in the singular it is the choice of the determiner which decides whether the kind defined by the head noun is a single entity, i.e. a mass, still conceived of as a set, now consisting of potentially infinite subparts (in such a case quantification ranges over this set of subparts), or again a set

of individual entities. The empty determiner in the Romance and Germanic languages always selects the former option, which results in the mass interpretation <sup>30</sup>.

The pattern of common nouns occurring with empty Ds can thus be accounted for by the suggestion just made, which crucially relies on a quantificational interpretation of the DP structure, namely takes the D position to be an operator and the common noun to define a range, i.e. a restrictive clause, for its variable.

Therefore, along lines suggested in Abney (1987), we assume that the logical translation of a syntactic formula like

(44) [ D [ N ] ]

where D is a lexical or empty determiner and N a common noun, will be similar to

(45) Dx, such that x belongs to the class of Ns

so that (46) is to be understood as (47):

(46) The/every table

(47) The/ $\forall x$ , such that x belongs to the class of tables <sup>31</sup>

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<sup>30</sup> If head nouns in the N position always define kinds, understood as potentially infinite sets, it is not unreasonable to view their plural form or mass interpretation (where a mass is considered as a potentially infinite set of subparts) as the unmarked realization. A singular non mass-interpreted common noun as in *a girl* would then be morphologically 'disguised' as singular just as a consequence of syntactic agreement with its determiner, which is singular because it denotes a single entity. This property of agreement which 'singularizes' head nouns should be regarded as a marked lexical peculiarity of certain determiners. In this light it is not surprising that the empty determiner, being deprived of lexical content, fails to display such a peculiarity and resorts in all the Romance and Germanic languages to the unmarked option.

<sup>31</sup> As for the question of which type of operator the definite article exactly represents in its specific usages, we will follow Russell (1905,1919) and Neale (1990), among others, in taking an utterance of 'the F is G' as meaning the same as the conjunction of

(a)  $\exists$  exactly one x & Fx  
and

(b)  $\forall x, Fx \supset Gx$

correspondingly, an utterance of 'the Fs are Gs' will mean

(c)  $\exists$  at least two x & Fx  
and

(d)  $\forall x, Fx \supset Gx$

In the spirit of the suggestion made in Chomsky (1975), we may suppose that the particular meaning expressed by the definite article is essentially the second conjunct of the preceding formulae. The first part could be the consequence of a more general existential interpretation assigned by default to determiners and manifested most clearly in the case of the empty one.

The restriction of bare common nouns to a plural or mass interpretation appears, therefore, to be a reflex of their having to provide the input for a quantificational interpretation. This is made possible by defining a potentially infinite set, which may be used as the range of a variable bound by an operator. In this respect, we may say that all common nouns describe, that is intensionally define, a kind (a ‘universal’ in Russell’s 1912 sense) and acquire particular denotation only through the D position which quantifies over such a kind. Thus, this approach espouses and substantiates an essentially Russellian view of definite and indefinite descriptions (cf. Russell 1905, 1919 and the accurate discussion in Neale 1990).

Now, the fact that the other two types of nouns mentioned before, proper names and pronouns, occur without an overt determiner but are not constrained by such plural/mass restriction suggests on semantic grounds that they are likely to undergo a radically different interpretive process: they seem to be able to dispense completely with an interpretation in terms of quantificational structure and descriptive content, i.e., unlike common nouns, they need not provide a range to an operator. That no empty determiner plays any semantic role in the interpretation of pronouns and proper names is suggested also by another consideration: recall, in fact, that they surface articleless with a specific definite reading, i.e. without having to display either the indefinite (existential) or the generic one, a restriction which we have seen to necessarily constrain the interpretation of argument common nouns without an overt determiner.

In other words, a noun like *John* or *he* will not be normally understood as

(48)  $\exists x$ , such that  $x$  belongs to the class of John’s/ he’s

Rather, such expressions can be thought of as being directly assigned a *reference*, i.e. as non quantificationally interpreted. This semantic property of pronouns and proper names is likely to be responsible in turn for a syntactic generalization which singles out exactly the same two classes of elements. The relevant observation can be first formulated as a question internal to Romance syntax and then translated into a wider crosslinguistic generalization. In fact we have not yet raised the question of why it is only proper names and not also the common ones, in any possible reading, that may undergo movement to D, giving rise to alternations of the sort exemplified in (22) and (27)-(29) of section 3. But this problem, as we said, has a broader typological scope; in fact, of all kinds of head nouns throughout the Romance and Germanic languages only two can apparently be argued to occupy the D position at S-structure: certain proper names in Romance, as demonstrated above, and pronouns more generally, as

we are going to show directly. In fact, the lack of contrast between Italian and English with respect to the following structure

- (49) Noi ricchi stiamo diventando ancora più ricchi  
We rich are becoming even richer

suggests that personal pronouns, unlike proper names, do not differ in surface distribution in the two languages and that they are likely to uniformly occur at S-structure in the D position, hence always preadjectivally <sup>32</sup>. The fact that no alternation ever appears between forms like (49) and determined ones like the following

- (50) \*I ricchi noi....  
\*The rich we...

induces us to further believe that pronouns may directly occupy the D position already in D-structure, thus resurrecting Postal's (1969) original theory and confirming that no N raising process applies in the syntax of English <sup>33</sup>. Another similar reason to suppose that pronouns, unlike proper names, are base generated in D and not in N comes from the well known fact that proper names can (and actually must) be treated as common nouns under restrictive relative modification and stay in N also at S-structure, while this option is normally excluded with pronouns:

- (51) a. Il (simpatico) Gianni che conoscevo non esiste più

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<sup>32</sup> Although the test provided in the text is of limited scope, because normal adjectives can so modify just first and second person plural pronouns, its result can be reinforced and extended to the whole paradigm by means of the other test, based on the inflected forms of *solo* 'only', introduced in fn. 19 above:

- (a) Io/tu/lei sola  
I/you/she only(fem.sing.)  
(b) \*Sola io/tu/lei  
Only(fem.sing.) I/you/she  
(c) Noi/voi/loro soli  
We/you/they only(masc.plur.)  
(d) \*Soli noi/voi/loro  
Only(masc.plur.) we/you/they.

<sup>33</sup> Postal's analysis, in fact, also allows a natural treatment of phrases like

- (a) Noi medici  
We doctors  
(b) Voi avvocati  
You lawyers

as regular D+N structures, with the pronoun base generated in D and the N position occupied by the lexical head noun at all levels of representation.

- The (nice) Gianni that I used to know no longer exists
- b. \*Gianni (simpatico) che conoscevo non esiste più  
Gianni (nice) that I used to know no longer exists
- c. \*Il (simpatico) lui che conoscevo non esiste più  
The (nice) he that I used to know no longer exists

More generally, it seems that proper names differ from pronouns in that they may, under a relatively marked interpretation, provide a range satisfying essentially all kinds of overt or empty determiners which end up quantifying over different individuals (or stages of the same individual as in (51)); cf. some examples:

- (52) a. I met a (certain) Mary  
b. I visited the (two) Mary's yesterday  
c. Every Mary I met in my life  
d. Mary's are usually nice girls, according to my experience  
(generic reading)  
e. During my visit to the U.S. I met Mary's everywhere  
(existential reading)

It is easy to check that replacing *Mary* by *she* in (52) yields ungrammaticality in all the examples. The same results are reproducible in Italian, with only the predictable difference that the definite article is required in the generic example (52)a. The basic crosslinguistic generalization appears then to be the following: **common nouns** must always be used to provide a range to a (lexical or overt) determiner understood as an operator, **pronouns** can never undergo this interpretation, **proper names** can, at least in marked cases, but need not. When proper names do undergo the interpretation in question they obviously resort to their (impoverished) descriptive content, namely they define as a range for the variable the kind of all possible individuals named that way (or the kind of all possible stages of the relevant individual named that way).

It is plausible that such a postulated semantic tripartition of nominals is related to the independently attested differences among the positions that the items in question may occupy at S-structure. We have recognized, in fact, that **pronouns**, being base generated in D, never appear in the N position, that **proper names** occur in D at S-structure at least in some languages, and instead that **common nouns** never raise to D at S-structure, even in languages like Italian. Why should pronouns and proper names be crosslinguistically peculiar and different from other nouns with respect to their S-structure distribution? In this framework the natural hypothesis is that a noun, in order to provide a range to an operator, i.e. to be understood to define a potentially infinite set of entities of a certain kind (in the sense specified above), must crucially

head the N projections at S-structure. If common nouns are the ones which must always be so understood, it will follow that they will not be allowed to raise to D at S-structure in any Romance or Germanic language, including those where proper names instead do. It is again the suggested irrelevance of the quantified interpretation for pronouns and proper names, then, which determines their peculiar distributional possibilities. Of course, the noted syntactic and semantic differences between the two latter categories must follow from the additional assumption that pronouns are not lexical nouns at all, in the sense that they are generated as the spelling out of certain person (and other) features of the head D, while proper names, forming a potentially open class, seem to instantiate a lexical category naturally generated under the N position.

Such a theory explains, then, why, in Italian, raising to D is essentially confined to proper names and does not involve e.g. bare plurals, as is made clear both by their distribution, which we have noticed was apparently constrained by the lexical government condition on their empty determiner, and by the possibility of the A-N order:

- (53) Ci sono belle ragazze  
 There are pretty girls

Thus, our general framework of hypotheses draws a major line of separation between definite descriptions on one side and proper names on the other, practically supporting the semantic distinction between these two categories made by Kripke (1971,1972,1980) and assumed in Neale (1990); accordingly, such a framework is much less compatible with the view Russell eventually ended up holding, namely that classical proper names are just ‘disguised’ descriptions.

As a matter of fact, the distinction which we postulate between quantificational (descriptions) and referential (names) interpretation correlates precisely with the results of at least two independent semantic contrasts opposing definite descriptions and proper names: first of all, we have already noticed in fn.16 above that the existential import of proper names seems never to be affected by (has scope wider than) negation or intensional predicates (i.e. names always have a *transparent*, or *de re* reading); whereas descriptions, instead, give rise to frequent ambiguities. Cf., for instance, the unambiguous (54)a. with the fully ambiguous (*de re/de dicto*) (54)b.:

- (54)a. Gianni vorrebbe sposare Maria  
 Gianni would like to marry Maria  
 b. Gianni vorrebbe sposare la sua vicina di casa  
 Gianni would like to marry his neighbour

Correspondingly, (55)a. sounds as a straight contradiction, while (55)b. can be non-contradictory if *la sua vicina di casa* 'his neighbour' is read with different existential scopes in the two clauses:

- (55)a. Gianni vorrebbe sposare Maria, ma non vorrebbe sposare Maria  
Gianni would like to marry Maria, but would not like to marry Maria
- b. Gianni vorrebbe sposare la sua vicina di casa, ma non vorrebbe sposare la sua vicina di casa  
Gianni would like to marry his neighbour (in principle), but would not like to marry his neighbour (the actual one)

Such implication of unconditioned existence of the *denotatum* borne by proper names might follow from their directly referential interpretation in conjunction with one natural assumption, apparently shared also by Russell's theory of reference and descriptions (cf. Neale 1990, p.19): namely, that an utterance of a sentence containing a genuine referring expression expresses a meaningful proposition only if that expression has a referent<sup>34</sup>.

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<sup>34</sup> A potential problem for the generalization in question might be represented by the classical examples of fictional names, the apparently most plausible candidates for Russell's analysis of names as 'disguised' or 'abbreviated' descriptions. It might look, in fact, that such names are not read *de re* in intensional contexts, although they display exactly the same syntax as non-fictional proper names:

(a) Mary would like to marry Hamlet

However, it is doubtful that in sentences like these the fictional name is really understood *de dicto*. Consider, for instance, the following situation: John is a pagan, who strongly believes in the existence of the classical Olympic gods and further believes that sometimes they marry mortals. In such a situation, we might truly say of him

(b) John wants to marry Aphrodite

Now, since John is a sincere and persuaded believer, it seems that the *de dicto* informal representation in (c)

(c) John wants there to exist x, such that x=Aphrodite and he may marry x  
does not capture our semantic intuitions about (b), which are better approximated instead by (d):

(d) There exists x, such that x=Aphrodite and John wants to marry x

Of course, in order to adopt this *de re* representation, making it compatible with our being non-pagans, it is necessary to relativize existence, in such cases, to particular worlds which are fictional, but whose essential structure is well known among the speakers involved: such could be the world of the classical *pantheon* or of the Shakespearean tragedies and so on (cf. also on this point a parallel remark in Bonomi 1975, pp.51-52).

Another counterargument to a *de dicto* representation of fictional names may come from the behavior of analogous definite descriptions. Let us imagine a domain of discourse involving a particular literary (say, dramatic) genre, where one of the fixed fictional characters is normally termed 'the next door's woman'. Suppose now that within such a context the following sentence is uttered:

(e) John would like to marry the next door's woman

Another peculiarity of proper names has been pointed out by Kripke (1971, 1972, 1980) under the label of ‘rigid designation’. What Kripke remarked is that proper names, unlike allegedly equivalent descriptions, appear to designate the *same* object throughout all possible worlds, i.e. also in counterfactual situations. Compare the following two sentences:

- (56)a. Anselm was born in Aosta and became archbishop of Canterbury
- b. The discoverer of the ontological proof was born in Aosta and became archbishop of Canterbury

In the actual world these two propositions are both true and their truth can be ascertained by inspecting the biography of one and the same person. But let us imagine a counterfactual world in which the ontological proof was discovered by Albert of Saxony: in such a world the truth of (56)a. would still depend on the biography of the same character as before, namely Saint Anselm, but the truth of (56)b. would now be contingent on the biography of a totally different person. As Kripke noticed, it seems impossible to imagine any world where the truth of examples such as (56)a. depends on something other than the biography of Anselm himself. It is in this sense that proper names can be said to refer to the same object *rigidly*, i.e. in all possible worlds.

The cruciality of the articleless usage of proper names in order for them to display both the properties in question (transparency and rigidity) is suggested by examples like

- (57)a. John would like to marry *a* Mary
- b. *The/An* Anselm I met yesterday was born in Aosta

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It is clear that such a sentence would be at least three-way ambiguous: in addition to the classical *de re/de dicto* ambiguity with reference to the normal world of everyday life, a reading in which the definite description refers in the aforementioned fictional world must be considered. The latter reading, which would be the exact analogous of that of (a) above, must thus be distinguished from *both* readings concerning the normal world. Once such a move is taken, one way or the other, it becomes clear that the *de re/de dicto* distinction is incapable of capturing the semantic contrast between fictional and non-fictional readings of (e) and, by analogy, of sentences like (a). It is then plausible that fictional nominals must be interpreted with reference to a fictional, e.g. literary, world of their own and that in such a world they may assume the *de re* reading. If this approach is correct, we will be naturally led to the prediction that the latter reading will be obligatory in the case of a proper name like *Hamlet*, but will potentially alternate with the *de dicto* interpretation in the case of a description. Although subtle, it seems that the prediction is correct: in fact, *Hamlet* is likely to make no sense unless used in a well defined literary context where such a character has already been invented, while *the next door's woman* might be employed just to propose the invention of a new character, say, on the analogy of similar, already established ones (for instance, *the old man upstairs*, *the janitor*, etc.).

In the first sentence *a Mary* can easily be read *de dicto* (opaquely), and in the second it is possible to imagine different designations in different conceivable worlds, according to which particular Anselm I met in each of them (on these problems, however, cf. also the end of section 7. below).

In addition to rejoining Kripke's semantic arguments against the assimilation of proper names to descriptions, the syntactic evidence provided in this work appears, then, to support in a crucial manner Higginbotham's (1988) rejection of Burge's (1973) proposal: namely that proper names like *John* are essentially quantified expressions introduced by an invisible but semantically relevant determiner displaying a demonstrative interpretation. At a close look at the question, as we tried to provide, such a suggestion turns out to be already highly implausible for English and straightforwardly falsified by the Romance evidence, which suggests that the name itself occupies the D position and that this property crucially distinguishes it from common nouns. Rather, the empirical evidence uncovered by our syntactic analysis appears to provide the strongest support for what Burge criticizes as the traditional theory, namely that proper names are expressions of generality in sentences like (52), but assume direct reference, being interpreted as individual constants, in their most common, i.e. singular articleless, uses.

Of course, the present proposal is crucially presupposing that substitution of N into the D position does not allow any 'reconstructed' analysis at S-structure, at least for what concerns the principles of interpretation above: the noun itself and not its trace must head the NP at S-structure to satisfy the requirement for a set-denoting interpretation and provide a quantificational range. Intuitively speaking, it seems that the D position (the operator) and the N position (the range) must count as two separate entities and not as members of the same chain in order to trigger the quantified interpretation. This way of formulating the problem leads us, in turn, to capture another crosslinguistic subgeneralization: among the Romance and Germanic languages we have mentioned cases where raising to D can be argued to apply quite widespreadly, affecting also common nouns, namely in Rumanian and Scandinavian (cf. e.g. the Norwegian examples in (4)-(5)). At first sight, this should not be tolerated according to the principles formulated; but notice that if the relevant requirement is understood in the sense just explained, the Rumanian and Scandinavian cases fail to violate it, because in the latter languages raising to D does not obliterate the determiner, as in Italian, but rather incorporates it into the noun. We believe that this is not due to chance but reflects a significant typological generalization holding throughout Romance and Germanic, which would be a correct consequence of the interpretive strategy of (48):

(58) N-Raising Generalization:

in languages and constructions where raising of the head noun to the D position obliterates the article, only proper names are allowed to raise; in languages and constructions where raising adjoins (prefixes) the noun to the article, also common nouns may be allowed to raise to D.

It appears thus that for head movement two subcases with distinct properties must be defined, exactly as for movement of maximal projections: substitution, which exhaustively occupies the landing head position, and adjunction, which preserves the independent content of the landing position and, in our specific case, allows the trace of the raised N to provide the required quantificational range to the now surviving D position <sup>35</sup>.

In this section we have therefore tried to provide a preliminary explanation for a number of striking and so far poorly studied generalizations which characterize determiners and nouns throughout most Western European languages. Although still refinable in various ways, this proposal will also serve as a basis to attempt a non-stipulative approach to the cluster of Italian/English contrasts of the previous section.

## 6. The parametric proposal

In this section we try to hypothesize the existence of a parameter distinguishing Italian from English (and more generally Romance from Germanic) with respect to the differences listed in section 4. and displaying the following theoretically desirable properties: it will have a form similar to that of other well established syntactic parameters, the ability to explain the unexpected failure of contrast between the two languages concerning examples (39) (substantivized adjectives), and will be compatible with the plausible assumption that both the lexical government requirement and the default existential interpretation are universal constraints on empty determiners and not marked idiosyncracies of Italian syntax.

Let us assume, therefore, that both (59) and (60) are universal principles <sup>36</sup>:

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<sup>35</sup> For the idea that substitution and adjunction must be crucially distinguished in the theory of head movement, cf. also Rizzi and Roberts (1989) and Roberts (1991).

<sup>36</sup> It would probably be surprising for (59) and (60) not to be part also of English grammar and UG, for independent reasons: (59), because of the unmarked nature of the interpretation it imposes, as discussed in fn. 8 above, and (60) as a consequence of some version of the head government condition on empty categories, which is visibly active in English to similarly constrain the distribution of such a head as empty C.

- (59) [D e ] = default existential interpretation
- (60) An empty head must be lexically governed

Imagining, especially on the grounds of the discussion in the previous section, that [Dx: NP(x)] is a rough logical translation for D-NP structures, (59) amounts to saying that a D devoid of overt lexical content is always translated into the formula above as a pure existential operator, perhaps the semantically unmarked option, as giving rise in many cases to the least easily falsifiable statements. (60), in turn, is likely to be just one consequence of the general proper government condition requiring a lexical or coindexed head governor for every non-pronominal empty category.

We may now propose (61):

- (61) Parameter: N raises to D (by substitution) in the Syntax in Italian but not in English

This parameter appears to be a plausible instantiation of the well known parameter schema first proposed in Huang (1982): some languages perform only in Logical Form the same movement operations that other languages already perform in the Syntax. If this is the general pattern we may expect English to be able to substitute N for D as Italian does, but only as an instance of LF movement.

Let us consider now how this parametric hypothesis may account for the basic properties of English determiners and nouns noted in section 4. In its essentials, our solution will consist of transposing the well motivated raising analysis of Italian proper names first to English proper names and then of applying it to the problem of English bare nouns more generally <sup>37</sup>.

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<sup>37</sup> Now that substitution into D can be assumed to apply also to English proper names, we may raise the important question whether the crosslinguistic semantic properties of names discussed in section 5. (transparency and rigidity) are a consequence precisely of this process. In other words, is the fact that proper names are grammatically interpreted in the D position and not in the N position sufficient to determine their transparency and rigidity? We have already seen in section 5. that the mere lexical property of being 'proper' is by itself not sufficient to make transparent and rigid most names introduced by overt determiners, whereas, descriptively speaking, this effect is certainly induced by the absence of the article with a singular proper name. However, the most suggestive evidence that transparency and rigidity are one of the necessary consequences of interpreting a nominal head in the D position comes from the observation that the few common nouns which may undergo movement to D (cf. fn. 20 above about Italian; notice now that a similar pattern seems to concern also some of the corresponding English nouns, although the latter must be assumed to raise only in LF) display an obligatory *de re* and rigid reading precisely when raised. Consider, for instance, a fictitious world where half of the inhabitants was regularly born from two parents and the other half was cloned just from their

Suppose, thus, that the principles in (59)-(60) are checked at the level of LF: the status of (32) of section 4. repeated below becomes now unproblematic. In fact (32)b. is immediately ruled out by the formulation of (61) (lack of visible N raising in English), while (32)a. is not excluded by a head government violation or ruled semantically inappropriate by the existential reading imposed to the empty D if LF raising to fill in the latter has taken place before the application of (59)-(60):

- (32) a. Old John came in  
 b. \*John old came in

The logical form of (32)a., then, unlike its S-structure, will not contain an empty D but rather a trace of N and will look like (62), mirroring the S-structure of an Italian corresponding sentence:

- (62) [ John [ old *e* ] ] came in 38

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fathers' cells. Suppose further that, as an adult, not everyone knows how he or she was actually born. Now, in such a world, (a) may be uttered by someone still doubtful about his birth, while (b) could only be used by someone already knowing he was regularly given birth to by a woman:

- (a) Ora vorrei ritrovare la mamma  
 Now I would like to find the mom  
 (b) Ora vorrei ritrovare mamma  
 Now I would like to find mom

Thus, *mamma* is obligatorily *de re* in (b), while it can be *de dicto* in (a). A similar case can be made also for *casa* 'home' or *camera* 'room':

- (c) L'ufficiale sperava che gli fosse assegnata la sua camera  
 The officer hoped that he could be assigned the his room  
 (d) L'ufficiale sperava che gli fosse assegnata camera sua  
 The officer hoped that he could be assigned room his

the first sentence does not imply that the officer already occupied one particular room which he wishes he can obtain again, while the second one does. This seems to be the manifestation of an obligatory *de re* reading of raised *camera* in (d).

As far as the rigidity facts are concerned, it appears that raised kinship nouns are definitely as rigid as pronouns and proper names, and that a similar tendency exists for *casa* and *camera*, although the judgments are much less sharp in the latter cases.

38 The same LF raising analysis would be assigned to the geographic names of English whose correspondents require the article in Italian (egs.(34) above). If the Italian side of the parameter is representative of the whole *Romania*, as we believe, it is then necessary to analyze the articleless occurrences of names of countries found in Spanish or Catalan (and Old Italian) as cases of syntactic N-raising to D. The apparently correct prediction of this analysis is that the formal resemblance of such structures to the English ones should break down when an adjective precedes the head noun: in fact in this latter case Spanish and Catalan country names cannot remain articleless. In Italian such names, as well as last names referring to women (egs.(23)) and others, like those of firms, associations, sport teams should be lexically marked as non-raising on the basis precisely of their belonging into these semantic classes.

Recall now that we had some evidence in section 5. that the predicative licensing of NPs has to be satisfied at S-structure, universally preventing bare common nouns from substituting into D before such a level. This leaves open the possibility that by LF movement not only proper names but also determinerless common nouns may undergo raising to D, once they satisfied the predicative licensing in the N position at S-structure. In this sense we can expect LF movement to raise to D even more types of head nouns than the syntactic movement visible in Italian. Hence it comes as no surprise that English bare plurals and mass nouns may occur in non-lexically governed positions and are not necessarily confined to the existential interpretation imposed by principle (59). In fact, in

- (63) a. Big beavers build dams
- b. Fresh water is often drinkable

the nouns *beavers* and *water* can be assumed to substitute in LF for the empty D to prevent a proper government violation, and the mentioned ambiguity of

- (36) I only excluded old ladies

will be due to the fact that *ladies* is allowed to LF-raise to fill in the empty D position before the application of principle (59) assigns it the existential interpretation. If the noun actually raises, the structure may receive the generic reading.

Why does now Italian differ from the English pattern in the way outlined throughout the article? Recall that we have pretheoretically acknowledged, in our formulation of generalization (18) of section 2., that it is the visible, S-structure distribution of the empty determiner which is constrained by the lexical government requirement and by the default existential interpretation in Italian. The fact that Italian cannot apparently escape the strictures of principles (59)-(60) exploiting N-raising in LF in the same way as English does seems thus to follow from one of these two possibilities: either Italian lacks LF-raising of nouns completely or (59)-(60) apply at S-structure and cannot be delayed until LF, in Italian, so that any application of LF movement would be irrelevant.

The first solution appears less plausible from a theoretical and typological point of view: it is often claimed that the canonical situation is that core movement rules are the same for all languages in LF and that some parametrization applies to their availability before S-structure; this view is supported by the fact that in the well studied case of the wh-movement parameter (Huang 1982 and subsequent work) languages which display movement in the Syntax, like e.g. English and French, can all be claimed to allow instances of the same movement in LF.

The second solution looks more promising, especially if we can show that it need not be stated as a separate parameter independent of the one in (61). Consider in fact that, in the spirit of Pesetsky's (1989) 'Earliness Principle', we might formulate a general crosslinguistic condition on the level of application of (59) and (60) in the following way:

(64) The default existential interpretation is assigned to DPs as early as possible (S-structure or LF, depending on the movement parameter) and cannot be changed in the course of the derivation

(65) Condition (60) on empty Ds is also checked as early as possible

The plausibility of a similar approach is suggested by its similarity to that which seems required by certain contrasts between a language with both syntactic and LF wh-movement, like French, and Oriental languages without syntactic wh-movement (cf. Pesetsky 1989). In French, question wh-phrases can be left *in situ* but, when embedded in a subordinate clause, they are unambiguously construed as having 'root' scope, i.e. the matrix sentence is always a direct question and the embedded one a declarative; the reverse interpretation, which should be produced by the wh-phrase taking narrow scope over the subordinate and turning it into an embedded question, is impossible even when the matrix predicate could select a +WH complement, i.e. an indirect question, as in (66):

(66) Tu sais que Marie est allée où ?  
You know Mary went where ?

Now, it seems to be a fact that analogous sentences are ambiguous in Chinese-Japanese, allowing both 'root' and embedded scope of the wh-phrase (cf. again Huang 1982, Lasnik and Saito 1984 and subsequent work). An immediate interpretation of this contrast is that in languages with the syntactic movement option the declarative or interrogative status of a complement CP must be decided already at S-structure, depending on whether a wh-phrase has been moved into its Spec or not, whereas if no such movement is allowed before the LF component the same decision (or checking) may be delayed until the LF level. The idea is summarized in (67), whose formal resemblance to (64) is apparent:

(67)  $\pm$ WH status is assigned to embedded CPs as early as possible (S-structure or LF, depending on the movement parameter) and cannot be changed in the course of the derivation

It is clear now that our assumption that the application of (59)-(60) already takes place at S-structure in Italian but may be delayed until LF in English can be plausibly considered as an indirect consequence of parameter (61), which explains then all the major differences between the two languages in the distribution and interpretation of empty determiners.

There remain, however, two more questions to be addressed concerning the application of the proposed account to the patterns noticed in section 4. We must, first of all, explain the surprising convergence between English and Romance in the case of generic substantivized adjectives. The fact that English requires the definite article even in the plural interpretation, here, as exemplified in (39)a., repeated below

- (39) a. The rich are becoming even richer  
b. \*Rich are becoming even richer

is so striking and pretheoretically unexpected, in the light of the rest of the paradigm, that being able to account for this property can be regarded as a very strong test for a successful parametric theory of English and Romance generics. In our framework this peculiarity of the English pattern appears to be theoretically predictable on the basis of independent assumptions. In fact we have claimed that articleless generics in English are made possible by raising of the lexical head noun to fill the D position in LF. But, if no overt noun is present, as in the case of substantivized adjectives, this strategy cannot be resorted to. There remains, *a priori*, another option, namely raising the adjectival head: however a visible movement of A to D seems not to be attested in the syntax of any Romance or Germanic language. Supposing that substantivized adjectives are actually regular NPs with a null head and the AP occurring in their Spec, then raising from A to D is likely to be ruled out in principle as a violation of Travis' (1984) Head Movement Constraint, essentially since A is not the head of the direct complement of D<sup>39</sup>. If LF movement obeys at least those conditions which constrain visible movement, as appears to be true in many cases (cf. Longobardi's (1986) 'Correspondence Hypothesis'), it follows that no movement of A to D will be possible in English LF, reproducing for substantivized adjectives a situation essentially analogous to that typical of Romance. Thus, the pattern of English substantivized adjectives is correctly predicted by this framework of hypotheses to reproduce that of Italian: for the generic reading an article must be inserted just in order to prevent the D

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<sup>39</sup> The same reasoning remains true if APs are taken to occur in the Spec of some intermediate functional phrase appearing between D and NP, as proposed by Cinque (1990 and forthcoming) and in some of the other references cited in fn. 23 above.

position from being empty at LF and falling under the strictures of (59)-(60); the bare form is only marginally possible, heavily depending on the lexical choice of the adjective, but what is most relevant is that, whenever it occurs, it is subject to the existential interpretation and to the lexical government constraint, exactly like bare nouns in Romance:

- (68) a. ?There were homeless everywhere  
b. \*Homeless were everywhere

The second problem to be addressed concerns, instead, how a bare noun is sometimes allowed to achieve an existential interpretation in a non lexically governed position in English:

- (69) a. Dogs were sitting on my lawn  
b. Dogs were everywhere

In principle, the present analysis leads to the expectation that this sort of sentences should be ungrammatical or only markedly acceptable: For we have proposed to address the problem of English bare nouns along the same lines of the solution provided for proper names: the latter were taken, by means of one and the same resort, namely raising to D (visible in Italian, abstract in English), to escape both the existential interpretation and the strictures of the lexical government requirement; thus we are induced to predict the existential reading of bare nouns to be ruled out in non-lexically governed positions. Actually, it appears, according to the recent literature (Diesing 1988,1989, Kratzer 1988, Brugger 1990), that this prediction is essentially correct in such a closely related language as German. Furthermore, similar data arise also in Scandinavian, according to T.Taraldsen (p.c.). Thus, the basic typological generalization is likely to be not just that the possibility for a language to license bare nouns surfacing outside VP correlates with that of having generically interpreted bare nouns but also that, in the unmarked case, bare nouns outside VP can *only* be generically interpreted. At least, this appears to be the situation in all the Continental Germanic languages <sup>40</sup>. Therefore, it seems correct for our framework to regard the

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<sup>40</sup> Since such languages are all V-2 languages in matrix clause, the relevant position external to VP is that of subjects of subordinate clauses introduced by an overt complementizer. In these latter sentences it is clear that the subject position outside VP is the Spec of IP, as in English, and that it is not lexically governed (cf. Diesing 1989). The position of Spec of CP, often moved into by subjects in main clauses as a consequence of the V-2 constraint, is likely to be irrelevant to the present discussion, since it seems to allow reconstruction of the interpretive properties of the landed item into its base position (like topicalization in Italian: cf. fn. 10 above), which is likely to coincide with a VP-internal extraction site.

acceptability of (69) in English as a marked phenomenon. Such predicted markedness also appears to be empirically reflected by the relative variability in the acceptance of these constructions among speakers and by the influence on it of different lexical choices. Let us consider now which particular mechanisms could account for (69) in the system presented here. A possible proposal might crucially exploit the derivational properties of grammar in order to derive (69) and to try to express its marked character. Consider, in fact, that nothing so far prevents the default existential rule (59) from optionally applying already at S-structure in English as well, while the proper government requirement (60) may continue to be checked at LF. Suppose that this is actually the case in (69): default existential closure may determine the interpretation of the empty D introducing *dogs* as early as at S-structure, but later LF-raising of the head noun itself would fill this position preventing a violation of (60) at LF. The critical role played by N-raising to D in avoiding a proper government violation also in this case is strongly suggested by the unacceptability of the same construction with substantivized adjectives (cf. (68)), i.e. precisely in the one structure where movement to D was argued to be inapplicable. The marked flavor of the construction may be a natural consequence of the fact that in the presence of the obvious mismatch between the appearance of S-structure and that of LF it is the former which determines the quantificational interpretation of this structure. As noticed, other languages seem not to accept this peculiar strategy, limiting the existential interpretation to LF formulae or ‘freezing’ already interpreted S-structures. However an appealing alternative approach is also conceivable. Actually, Kratzer (1988) and Diesing (1988 and especially 1989) have already independently proposed that in English the subjects of stage level predicates, i.e. exactly those allowing the existential interpretation as found in e.g. (69), can be reconstructed into a VP internal position at LF, even though occurring in Spec IP at S-structure. This position, probably identifiable with Spec VP, is likely to satisfy the lexical government conditions for empty categories either by virtue of the head V, a lexical governor, or of the head I: the latter could probably govern under coindexing a subject phrase lying in the Spec of its complement VP. In fact, it is suggestive that in German, where a comparable VP internal position can be occupied by subjects at S-structure as well, extraction of proper subparts of such subjects is grammatical, though remaining excluded for subparts of subject phrases lying in Spec IP (cf. Diesing 1989). This could be attributed to a difference in L-marking (in Chomsky’s 1986b terms) between the two positions, obviously correlated with a difference in ‘proper’ or ‘lexical’ government of the kind relevant for the licensing of empty heads. Therefore, the independent assumptions made by Kratzer and by Diesing seem to leave us, in interaction with our framework, with exactly the correct prediction we were aiming at: namely that the empty D of (69) will be in a properly governed position at the relevant

level of representation (LF) in English; it will not need to be filled by N-raising and will receive a default existential interpretation. Such possibility of lowering the subject into VP at LF being restricted to English, as claimed in the references cited, it is also correctly predicted that in other Germanic languages no existential bare noun will ever arise in Spec IP.

This very interesting solution to the problem raised by (69) faces a potential difficulty, however, in front of data like (68). If the contrast between (68)b. and (69)b. is solid and relevant (which is not completely beyond dispute), it seems to point out that raising of a lexical head noun to D plays a crucial role also in the grammaticalness of (69). Thus, in the present framework, appeal can be made to the Kratzer-Diesing proposal only by additionally assuming that the head government requirement must be satisfied at LF both in the actual (Spec IP) and the reconstructed (Spec VP) position, while only the latter would be used for interpretation. Of course, the concept of reconstruction presupposed by this assumption implies that the trace position contains an abstract structured copy of the moved phrase. Under this conception, in Spec IP, i.e. the position inert for the interpretation of the determiner, the government constraint would be overcome by eliminating the empty D through raising, whereas in the copy of the phrase left in Spec VP for reconstruction the D would remain empty to be existentially interpreted and would be properly governed by a relevant head along the lines suggested above.

## 7. The concept of expletive article

Consider now the question of the interpretation of generic DPs in English. We have seen that such constructions are likely to exemplify a case of raising of N to D in LF. Thus, the LF of sentences (63) above, for example, should look like (70)

- (70) a. [ beavers [ big *e* ] ] build dams  
b. [ water [ fresh *e* ] ] is often drinkable

whose resemblance to the assumed LF of singular proper names, as was exemplified in (62), repeated below, is obvious:

- (62) [ John [ old *e* ] ] came in

Since LF was shown to be the interpretively most relevant level for Ds and Ns at least in English, it is plausible that this formal similarity between the LFs of generics and

proper names corresponds to a similarity of interpretation. The hypothesis is quite appealing but it faces some difficulties which have to be removed: for we have seen that, while the syntax of these two types of expressions is virtually identical in English (they both stay in N at S-structure and raise to D in LF), it differs in Italian: generics must remain in N at S-structure, many proper names instead can raise (and actually have to if no determiner is inserted).

This appears to suggest that generics have some properties of proper names and some others of the normal specific usages of common nouns. In fact, like proper names, generics in English leave no place in D for an overt or empty operator (a lexical determiner or a default existential), making necessary some sort of referential interpretation. On the other side, given the interpretation that we have advocated in section 5. for the N position, namely that a head noun in such a position at S-structure defines a potentially infinite set which constitutes a natural kind, it is obvious that generically interpreted nouns, being expressions for kinds, must occur in N at that level. Hence, combining these two insights, we may conclude that the syntactic evidence provided by our analysis supports, for generics, a definition originally proposed by Carlson (1977b) for all English bare plurals, i.e. that they are proper names for kinds: thus, they are assigned as their reference the whole set of potentially infinite members (kind) defined by the head noun <sup>41</sup>. In other terms, they can be regarded as universal concepts which acquire particular denotation <sup>42</sup>.

The difference with real proper names is that the latter, in their specific articleless usage, seem instead to always refer to an entity intrinsically conceptualized as unique in the domain of discourse. This interpretive property of proper names is independently suggested by the fact that whenever they occur in the plural they lose

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41 This analysis, however, does not exclude that so conceived generic DPs can provide the quantificational range to the special operator *Gen* or to Lewis' (1975) adverbs of quantification, as often proposed in the literature (cf. Diesing 1989 among others). Such abstract operators could quantify over DP in a way similar to *all*, which in fact introduces generic DPs as well as more specific ones and proper names:

- (a) All men
- (b) All the men of this class
- (c) All of John, Mary, and Bill

The presence of such operators might perhaps explain the relevant part of the scopal effects noticed for bare nouns by Delfitto and Schrotten (1991) and apparently overlooked in Carlson (1977a and b).

42 It is not empirically clear whether generic phrases display the transparency and rigidity properties typical of raised proper names. However, it is not implausible that in sentences like

- (a) A friend of mine would like to study dinosaurs
- dinosaurs* is necessarily *de re* and rigid. For proposals that simple generic nominals denoting natural kinds are actually rigid designators, cf. Putnam (1970) and Kripke (1972, 1980).

their peculiarities and behave like common nouns: in particular in a paradigm such as (52), reproduced below,

- (52) a. I met a (certain) Mary  
b. I visited the (two) Mary's yesterday  
c. Every Mary I met in my life  
d. Mary's are usually nice girls, according to my experience  
(generic reading)  
e. During my visit to the U.S. I met Mary's everywhere  
(existential reading)

the bare occurrences of plural proper names (examples d. and e.) can only have the generic or existential reading and the only way for them to acquire a definite specific denotation is inserting the article as in (52)b. Such a characteristic is not particular of English but also of the Romance languages, with the predictable difference that the generic reading requires the definite article, bare nouns only being existentially interpreted:

- (71) a. Ho telefonato alle (due) Marie  
I called up the (two) Maria's  
b. Le Marie di solito sono brave ragazze  
Maria's are usually good girls  
c. Ho incontrato Marie dappertutto  
I met Maria's everywhere

In fact, English and Romance notoriously cease to contrast also with respect to plural family or geographic names, as e.g. in the following case:

- (72) I visited \*(the) United States  
Ho visitato \*(gli) Stati Uniti

This domain of facts is likely to suggest that a crucial empirical property of the ontology supposed by the semantics of natural language is that, abstracting away from events and states, it only contains two types of entities: single individuals (sometimes conceived of as consisting of stages or material subparts) and whole kinds, but no subsets of such kinds. Therefore, the only objects which may be designated by nominals are exactly these, issuing the two basic cases of directly referential

expressions: singular proper names and generics<sup>43</sup>. All plural specific readings of DPs must thus be attained through quantification<sup>44</sup>.

Thus, let us reformulate and clarify the semantic assumptions that our syntactic analysis of nominals seems to lead to: we can affirm that the N position is interpreted (at S-structure, if at all) as defining universal concepts, i.e. potentially infinite sets (kinds), which might be viewed as the necessary basis to construct the traditional Fregean notion of the 'sense' or descriptive content of a nominal expression; the D position, instead, determines the particular denotation of the argument, directly, by being assigned a reference, or indirectly, that is by creating a quantificational structure. The specific readings of common nouns are all obtained by letting the operator lexically present or understood in the D position quantify over the set defined by the N position. The specific definite reading of articleless proper names is obtained by raising the head noun to D at some level of representation and leaving the foot of the chain (i.e. the N position) *uninterpreted*. In this technical respect, proper names can be correctly claimed not to resort to their 'sense' (descriptive content) to be interpreted, but just to assume direct reference to the entity they designate. The ontology hypothesized before restricts this possibility to singular names.

Now, the interpretation of generics can be clarified in a much better way, particularly on the basis of the assumed syntactic behavior of the English ones: in fact, they also create a chain at LF between D and N, but both positions are interpreted: therefore reference is assigned through D to the complete set defined by N, that is the whole kind. In our adaptation of Fregean terms, *sense* and *reference* may coincide.

Thus, with English generics a chain relates two equally relevant interpretive positions. Since the meaning and distribution of Italian generics appears to be the same as in English, it would be implausible for Italian to resort to a radically different mechanism of interpretation. However, as we know, in Italian the D position cannot remain empty at S-structure unless the existential interpretation is required and, thus, some

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<sup>43</sup> Pronouns appear to differ from proper names in that they exhibit plural forms occurring in D (cf. section 5. above). Although we will not be concerned with that problem here, it is anyway interesting to remark that at least in the first and second person the so-called plural pronouns do not seem to exactly represent the plural of the supposed corresponding singular: e.g. *we* does not mean *several I's* but rather *I and someone else*. This is also reflected in the lack of morphological correlation between singular and plural forms of first and second person pronouns in many languages. Therefore the very notion of plurality might be inappropriate for such expressions. A similar line of reasoning cannot, however, be easily applied to the problem of third person pronouns (cf. also Benveniste 1966). It is also possible that pronouns and indexicals more generally are outside of the core ontology system sketched in the text.

<sup>44</sup> This means that collective readings of plural DPs will have to be regarded as derivative effects, i.e. formed by constructing the set of the values assigned to the variable in the relevant quantificational interpretation.

morpheme must anyway be inserted as a determiner, namely the definite article. The same link between D and N established in English through an LF chain must then hold in Italian generics by means of a relationship between the head noun and the overt article. In analogy with the terminology used for the closely corresponding relationships established between maximal projections, we can say that the two relevant positions are related by a CHAIN (cf. Chomsky 1986a) in Italian and that the overt definite article used with generic DPs is an *expletive* one. Consider also that it is not the case that expletive articles in this sense are exclusive of Romance generics: in fact, we have seen that if a head noun is in the singular the non-mass interpretation can never be expressed through the empty determiner; therefore there are independent reasons to expect singular generics to be necessarily introduced by an article also in English whenever they express the count reading <sup>45</sup>. The prediction is obviously correct:

- (73) a. The lion has four legs  
      b. \*Lion has four legs  
      c. Lion is not good to eat

The notion of expletive article just introduced significantly converges, apart from minor differences, with the analogous one independently arrived at, as the result of an articulated semantic analysis, in Vergnaud and Zubizarreta (1990, 1991) and can be constructed also from a slightly different perspective <sup>46</sup>. Recall in fact that proper names have been shown to be universally able to achieve their specific definite reading without resorting to the quantificational structure which requires the D position to have substantive semantic content. Thus, those instances of the definite article sometimes employed to introduce certain unmodified proper names, as in Italian, need not be considered as having substantive semantic content but can rather be regarded as other instances of expletive articles, heading a CHAIN which alternates in some cases with

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<sup>45</sup> In this sense, imposing the mass reading to singular head nouns must be a property of determiners empty at S-structure which becomes operative whenever the N itself is semantically interpreted, i.e. whenever such a position is used to describe a kind and to provide a *potential* quantificational range. In other words, the restriction is active also with generic expressions, where the D does not function as an operator and, therefore the range is not *actually* used. Only proper names, leaving the N position, uninterpreted may escape the constraint.

<sup>46</sup> The intuition that the article employed in sentences like (73)a. actually has no real semantic content is anticipated in Ramat (1985, ch. 3 section 4).

the corresponding chain <sup>47</sup>. Therefore, the alternations displayed in (22) above and reproduced below

- (22) a. Gianni mi ha telefonato  
Gianni called me up  
b. Il Gianni mi ha telefonato  
The Gianni called me up

can be viewed as analogous to the well known ones exemplified in English structures like the following:

- (74) a. Many people were killed  
b. There were killed many people <sup>48</sup>

There is even a piece of evidence suggesting that the article introducing simple, unmodified proper names not only *can* but actually *must* be always understood as expletive: such evidence can be constructed in Italian, on the basis of an original observation by G.Cinque (p.c.). He pointed out that coordination of two NPs, one headed by an unmodified proper name and the other by a common noun, excluding the definite article, turns out to be sharply impossible in all dialects, thus contrasting with the results of (21)a. above:

- (75) \*La Maria e (mia) segretaria è arrivata in ritardo  
The Maria and (my) secretary arrived late

The otherwise surprising ungrammaticality of this coordination can be immediately explained by the assumption that the two NPs do not meet the requirement of identity in interpretation which seems to be necessary for coordination: in fact, according to

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<sup>47</sup> Correspondingly, the interpretation of such DPs does not differ from that of bare proper names: for instance, the semantic properties noted in section 5. as opposing names to real descriptions (obligatory transparency and rigidity) can be exactly reproduced for such proper names introduced by the article in Romance. It is not obvious, however, that this constitutes a genuine additional argument for the expletive nature of that article, since the same properties seem to hold for plural proper names, such as those of (72) above, where the article will be argued in the next section to be non-expletive.

<sup>48</sup> It is highly theory-dependent and not empirically clear whether (22)b. and similar sentences can be taken to display the same logical form as (22)a. through an LF rule of 'expletive replacement' substituting *Gianni* for *il*. The rule would be analogous to that sometimes proposed (cf. e.g. Chomsky 1986a) to unify the logical forms of pairs like (74).

our proposal, *segretaria* must be a predicate instantiating a quantificational range for the article understood as an operator, whereas *Maria* does not need to do so. The data in (75) suggest an even stronger conclusion, namely that it is never allowed to do so. To put it otherwise, proper names resort to their descriptive content as least as they can, namely just in case they need a quantified interpretation in order to convey a meaning different from the one expressible through direct reference. Therefore, we are led to the hypothesis that in *all* structures like (22)b. the article fails to function as an operator, but is rather an expletive<sup>49</sup>. Some comparative evidence corroborating the introduction of such a notion of ‘expletive article’, both on syntactic and morphological grounds, will constitute the main subject of the next section.

## 8. Typological evidence

There is one property of the English cluster discussed in section 5. which has not yet been explained and cannot apparently be reduced to parameter (61): it is the fact that English never tolerates the use of the definite article with plural and mass generics and singular proper names, exemplified in (38) above. Notice that such cases are exactly those which, in languages like Italian, were taken to display expletive occurrences of the article. The residual difference between the two languages could then be dealt with by the claim that English does not allow expletive occurrences of the article. However, as we have noticed before, there is at least one case in which an article can be regarded as expletive in English as well, namely with singular non-mass generics, such as that of (73)a. above. To this we may add the case of generic substantivized adjectives, discussed in section 6. Therefore, the previous proposal appears too strong, but can be adequately weakened in the following way:

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<sup>49</sup> It should be easier to coordinate a common noun with a proper name clearly used as a predicative expression providing the quantificational range to a non expletive article. Though somewhat marginal and emphatic in style, some sentences appear to fulfill the prediction, as they sharply contrast anyway with the completely ungrammatical example (75) of the text:

- (a) ?A quell’epoca la Roma dei Cesari e urbe dell’orbe già non esisteva più  
By that period the Rome of the Caesars and capital city of the world already no longer existed
- (b) ?A quell’epoca la Parigi di Saussure, di Bréal e di Meillet e città guida della comparatistica europea era ormai solo un ricordo del passato.  
By that time the Paris of Saussure, Bréal, Meillet and leading city of European comparative philology was nothing but a memory of the past.
- (c) ?Il Dante della *Commedia* e massimo poeta italiano non è sempre facilmente riconoscibile nei versi della *Vita nova*  
The Dante of the *Commedia* and greatest Italian poet is not always easily recognizable in the poems of the *Vita Nova*
- (d) Questo Cicerone o Tullio, che dir si voglia, fu il più famoso avvocato romano  
This Cicero or Tully, as you prefer, was the best known Roman attorney.

(76) Expletive articles are licensed only as a last resort

where ‘as a last resort’ essentially means ‘if no synonymous raising derivation is available’.

Even rephrased in this weaker form, which seems to be correct for English, such a principle can hardly be regarded as universal and thus extended to Romance, at least to the varieties which accept structures like (22)b. In order to do so it should be assumed that pairs like (22) do not represent real language-internal alternations but rather sentences from distinct and complementary dialects, idiolects or styles, i.e., briefly, from two different competences. Whatever solution is eventually chosen, mainly on metatheoretical grounds, it must be recalled that it is anyway unavoidable to postulate some independent parametrization or complications of (76) in order to account for the distribution of expletive articles in various Germanic languages and dialects.

In the versions of Standard German spoken in Austria and Southern Germany, for instance, it is normally possible to use both plural and mass generics and proper personal names with or without the definite article, so that either variant of (77)-(78) appears to be acceptable, with essentially the same generic interpretation, and the same is true of pairs like (79):

(77) a. Biber bauen Dämme

Beavers build dams

b. Die Biber bauen Dämme

The beavers build dams

(78) a. Milch ist weiß

Milk is white

b. Die Milch ist weiß

The milk is white

(79) a. Hans ist angekommen

Hans has arrived

b. Der Hans ist angekommen

The Hans has arrived <sup>50</sup>

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<sup>50</sup> All varieties of German also seem to differ from English in that any type of adjectival modification prevents proper names from occurring articleless, i.e. from raising to D in LF. Cf. for instance:

(a) \*Alter Hans ist angekommen

Old Hans arrived

(b) Der alte Hans ist angekommen

The old Hans arrived.

What is remarkable, from the viewpoint of our suggestion that a concept of expletive article be introduced in UG, is that the optionality of the definite article arises precisely in the two cases, generics and proper names, where such an article was predicted to be expletive. In addition, it seems that the same cluster of properties (the article is possible with generics and there are at least some dialects using it before proper names) can be found also in Scandinavian, e.g. in Norwegian, as pointed out by T. Taraldsen (p.c.). Therefore, the behavior of these other Germanic languages can be easily captured by parametrizing (76) in such a way as to allow optional licensing of expletive articles even in some languages and constructions which might dispense with them. In fact, no Germanic variety, as far as we know, accepts any of the data which motivate an N-raising analysis already in the Syntax, namely they all choose the ‘English’ value of parameter (61). This fact witnesses the independence of the two parameters from each other: English and German are both opposed to Italian with respect to raising of N in the Syntax, but differ with respect to the option of using expletive articles, which are allowed in some varieties of the latter language <sup>51</sup>. In the framework of this analysis, the fact that no variety of English seems to ever admit a singular unmodified proper name introduced by the article turns out to be significantly related to the fact that no variety of English allows the article with plural or mass generics either <sup>52</sup>.

G. Brugger (p.c.) observes that, typologically, such peculiarity of English of limiting the use of expletive articles in the manner described might significantly correlate with the lack of morphological expression of gender and number on the article. Actually, the rest of Germanic, Romance and Greek appear both to have some inflection for gender and number on the definite article and to display freer use of its expletive occurrences, in particular with proper names. If this generalization is indeed correct, it must follow from some more general principle: let us suppose e.g. that when not required as a ‘last resort’ in the sense specified above, an expletive article is

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<sup>51</sup> Cf. Brugger (forthcoming) for an analysis attempting to characterize exactly the distribution of the two types in German, mainly on the basis of the distinctions alluded to in fn. 28 above.

<sup>52</sup> German, instead, in addition to having varieties which employ the article with generics and proper names, uses the definite article to introduce some names of countries (*die Schweiz* ‘Switzerland’, *die Türkei* ‘Turkey’) also in the Standard language. Again, a similar situation with respect to this cluster of properties seems to hold also in Norwegian. It is still unclear and makes an important objective of investigation whether this new difference between English and Continental Germanic can be typologically and theoretically related to the other one discussed at the end of section 6. and concerning the marked acceptability of an existential reading of bare nouns in Spec IP.

always ungrammatical (i.e. (76), the supposed English value of the parameter is universal) unless licensed by the need to spell out some abstract morphological content: e.g. gender or number features present in D as a result of (optional) agreement with the head noun. In more accurate terms, (76) should be replaced by a principle of UG like the following:

- (80) The phonetic realization of the D position is licensed only if it expresses semantic content or grammatical features, or as a last resort.

The last two cases are those instantiated by the expletive occurrences of the article. By means of this hypothesis the distributional restrictions on the use of the article found in English but not in other Germanic languages (or in Romance) could be made to follow from independent morphological properties of the language.

In any event, what is clear is that crucial reference to this special expletive status of the definite article is needed to account for the typology of its distribution in the languages so far examined; this fact already reinforces the proposal of introducing such a notion. However, some of the most interesting evidence supporting our introduction of the concept of expletive article comes from the morphology of determiners in certain Romance and Germanic varieties. Consider, in fact, that we have implicitly assumed so far that the traditional definite article of English and Italian is actually a morphological neutralization of two distinct syntactic entities: an expletive and a substantive, really definite, determiner, the latter functioning as an operator. This analysis naturally leads to the expectation that there may exist languages in which the real definite article may cease to be homophonous with expletive articles. This prediction appears to be borne out by the typological evidence. Notice, first of all, that in principle we have introduced two, slightly different, sorts of expletive article: one occurs with proper names and the other with generic expressions. While both are expletive in the sense of not having any substantive interpretation as semantic operators, they are likely to be contextually distinguishable on the basis of the semantic correlates of the theory of predication, along lines suggested by S. Rothstein (p.c.): the former type saturates its NP predicate only syntactically, since a proper name seems to lack any kind-denoting interpretation in the N position, i.e. any sense; therefore the expletive article of proper names relates an interpretively relevant position (the D one, for assignment of reference) to an interpretively irrelevant one (the N position). The type occurring with generics saturates a semantically relevant NP predicate, which denotes a kind, and relates two interpretively active positions (N and D), thus identifying sense and actual reference. The distinction can perhaps bear some analogy to that between  $X^{\max}$  expletives occurring in  $\Theta$ -marked and non  $\Theta$ -marked positions.

In fact also in the case of the saturation of a VP predicate by a subject phrase, two subcases can perhaps be distinguished: the syntactic saturation of a VP may or may not have a semantic correlate, namely  $\Theta$ -marking of the subject, according to whether the predicate discharges a so called external  $\Theta$ -role or not (cf. Rothstein 1983, 1990). In the latter case, the subject is said to be an expletive. However, another case of expletive subject is also found, when the predicate does assign an external role but such an interpretation must be transmitted to a phrase not occupying the canonical subject position (whether this is identified with Spec IP or even with Spec VP). The two expletive cases are likely to be instantiated by the following English examples, where they also happen to be lexically distinguished:

- (81) a. *There* arrived few girls  
       b. *It* struck me that he came

Articles can be classified like subjects, with respect to the theory of predication: they may semantically saturate an NP contributing their own meaning (as operators) in the specific usages of common nouns, may be pure expletives, only syntactically saturating the NP, in the most normal reading of proper names, and finally can instantiate an intermediate case with generics, semantically saturating the NP but without contributing any content of their own.

It is then plausible to expect that in addition to cases of total neutralization between the three types, as in all the relevant Italian varieties here considered, there may be languages where the types are all distinct or languages where the so-called intermediate (i.e. generic) article neutralizes with either of the two extreme forms. It is obviously of high significance for the present theory that at least the latter two cases are actually attested among the Romance and Germanic languages. The evidence that we want to propose, which is certainly very far from being dialectologically exhaustive, concerns Catalan and the variety of Frisian described in Ebert (1970). Many varieties of Catalan distinguish between two types of definite article, one which is exclusively used with personal proper names, masc. *en* / (more rarely) fem. *na*, and another one employed in all other circumstances, i.e. with common nouns in the specific and generic readings and with non-personal proper names. This fact gives rise to patterns like the following:

- (82) a. El gos  
           The dog  
       b. En Pere  
           The Peter

In our framework this suggests that at least one subcase of what we identified as the expletive article introducing proper names surfaces as morphologically distinct from the other expletive type (the one introducing generic expressions) and from the regular, specific definite article (as well as from further, non personal subcases of the expletive article of proper names, e.g. in the case of the names of rivers or mountains). Given what we said in section 7. about the intrinsic singularity which is required for the directly referential interpretation of proper names, another important prediction ensues from our analysis of the Catalan article, namely that the same proper names that take the expletive article *en* in the singular will have to resort to the regular article *els* if used in the plural. For we have seen that if a name presupposes the possibility of non-singular reference it must always be interpreted quantificationally, i.e. like a common noun, and its article cannot be expletive any longer but rather must have semantic content as an operator. This crucial prediction is also correct, as was pointed out by V. Escandell (p.c.):

- (83) a. \*Ens (dos) Peres  
           The(expl.) (two) Peters  
       b. Els (dos) Peres  
           The (two) Peters

This fact suggests that the article *en* of Catalan should not even be described as simply being ‘the article of proper (personal) names’ but rather of ‘proper (personal) names in the singular’: such an apparently complex and idiosyncratic restriction follows naturally instead from the analysis presented here which relates the ungrammaticality of (83)a. to that e.g. of (72), repeated below:

- (72) I visited \*(the) United States  
       Ho visitato \*(gli) Stati Uniti

An analogous prediction arises and is correctly borne out in the case of restrictive relative modification of proper names; as exemplified in the contrast of (84), which exactly parallels that of (51)a.-b. of section 5. above, such structures must in fact resume the regular definite article:

- (84) a. El Joan que coneixia ja no existeix  
           The Joan that I used to know no longer exists  
       b. \*En Joan que coneixia ja no existeix  
           The(expl.) that I used to know no longer exists

- (51) a. Il (simpatico) Gianni che conoscevo non esiste più  
 The (nice) Gianni that I used to know no longer exists
- b. \*Gianni (simpatico) che conoscevo non esiste più  
 Gianni (nice) that I used to know no longer exists

Although such facts already provide interesting morphological support for the notion of expletive article, it turns out that the strongest evidence of this type comes from the analysis of a Germanic language, namely Frisian, at least the dialect spoken in the island of Föhr. In fact, Ebert's (1970) description of such a dialect, although not cast in the same terminological and theoretical framework as our analysis, provides sufficient data and discussion to allow us to summarize her generalizations in the following manner: the Föhr dialect displays two different types of non-indefinite article, one occurring only with definite specific nominals in both numbers (call it the D-article, given its morphological form, namely *di*, *det*, *det* for the three genders in the singular, plural *dön* for all genders), the other systematically found with proper names and with all types of generic phrases, i.e. plurals, mass singulars, count singulars and apparently substantivized adjectives (call it the A-article, after its morphological form, *a*, *at*, *at* in the singular, *a* in the plural). Here is a list of examples, all found in Ebert's work:

- (85) a. A Türkäi  
 The Turkey
- b. At weeder  
 The weather
- c. Me a deensken san we leewen frinjer weesen <sup>53</sup>  
 With Danes we have always been friends

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<sup>53</sup> The word for 'weather' is apparently understood as a mass term in Frisian, probably owing to the fact that it is not used in the plural. It must be recalled, however, that the use of the expletive article is extended in the dialect of Föhr to certain common nouns, whose uniqueness in the domain of discourse is contextually achieved through previous unambiguous mention or is especially salient due to their semantics. Among the latter expressions, termed by Ebert (1970) '*situative Unika*', are e.g. the words for 'sun', as unique in the solar system, and those for charges occupied by only one person in a relevant domain, such as the terms for 'parishioner' or 'mayor' in a village. The extension of the syntactic and logical behavior of proper names to such *situative Unika* might be an area of idiosyncratic variation potentially available to every language, perhaps manifested in Romance by the raising to D of those common nouns mentioned in fn. 20 above.

These cases exemplify the (obligatory <sup>54</sup>) use of the A-article with proper names, generic mass singulars and generic plurals respectively. (81)c. is also likely to instantiate at the same time a case of a generic plural substantivized adjective, given the use of the adjectival word *deensken* lit. 'Danish'. Interestingly enough, certain restricted proper names return to behave like common nouns, i.e. require the D-article and thus may be taken to suggest another overt parallel to examples like (51)a. of section 5.:

- (86) Det Moskau faan di tidj  
The Moscow of that time

Finally, other examples provided by Ebert show that the A-article must be used also with singular count nouns in their generic readings:

- (87) a. A aapel fäält äi widj faan a buum  
The apple does not fall far away from the tree (a well known proverbial expression)  
b. Me a tsuch  
With the train

although a few other complications intervene in the Frisian article system here in question, this set of data is sufficiently clear to allow us to attempt an interpretation in the theoretical terms that we have provided. In fact, the Föhr situation can be exactly described as one in which the two types of expletive articles, that of proper names and that of generic expressions, are morphologically neutralized in the A-form, while the substantive definite article takes the distinct D-form, with only its specific reading remaining available <sup>55</sup>.

Thus, Frisian is likely to fulfill in the most straightforward way the second neutralization expectation sketched above. What is even more remarkable, anyway, is the fact that the use of the A-article in this Frisian dialect could not be trivially described as corresponding to the English use of the empty determiner, since the latter

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<sup>54</sup> Also such obligatoriness of the use of the expletive article with proper names in the Föhr dialect confirms the conclusion, arrived at in the previous section, that singular (unmodified) proper names are *never* understood as quantified expressions of generality but *always* as directly referential expressions.

<sup>55</sup> Ebert (1970) also mentions the existence of other Frisian dialects where roughly the A-article is just used with proper names and singular generics and the D-one for specific and plural generic common nouns. Perhaps these varieties reflect an intermediate situation in which the expletive article only has a singular morphological expression and in the plural is neutralized with the regular definite one.

in English fails to replace *the* in two cases where Frisian appears still to employ its *a* : the cases of generic adjectives and that of singular count generics. However, we have provided independent evidence that the definite article of English is an expletive in precisely these two cases and that its occurrence is due to the fact that such two structural configurations would disallow the count reading, were it not for the non-emptiness of the D position. Now, since the Frisian A-article is an expletive with phonetic content, no trouble is predicted by our analysis to arise when it is employed even with substantivized adjectives and with singular count nouns. Therefore, Ebert's Frisian data here presented seem to provide one of the subtlest and most relevant sources of evidence in favor of the whole approach proposed in this paper.

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