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Centro Linguistico Interfacoltà
Università degli Studi di Venezia
S.Croce 2161 - 30135 Venezia
Tel. 39-41-5241642, Fax 39-41-718259
E-mail CLI@IVEUNCC.bitnet

Table of Contents

GENERIC INTERPRETATIONS AND EXPLETIVE DETERMINER[1]

Gerhard Brugger
Università di Venezia, Universität Wien

1. Two kinds of generic interpretation

1.1. Carlson (1977). Carlson (1977) analyzes English bare plurals as names of kinds. Generic interpretation arises when the predicate expresses a property of the kind denoted by the bare plural. So, for example, (1a) can express a property of the kind *dinosaur*; (1b) expresses a property of the kind *beaver*. [2]

(1) a. Dinosaurs became extinct 40,000 years ago
b. Beavers are intelligent

If generic bare plurals refer to kinds, just as proper names refer to individuals, we would expect them to be behave like referential expressions with respect to principle C. But, as we will see, this expectation is fulfilled only in contexts like (1a) but not in contexts like (1b).

1.2. Principle C effects. (2a) is ambiguous. The bare plural *dinosaurs* can have either existential interpretation or generic interpretation: John studied some dinosaurs or John studied the kind dinosaur.

(2) a. John studied dinosaurs
b. #John studied dinosaurs, which$_j$ became extinct although dinosaurs$_j$ had

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1 I thank Anna Cardinaletti, Guglielmo Cinque, Mario D'Angelo, Giuliana Giusti, Giuseppe Longobardi, Martin Prinzhorn, Barry Schein, Tim Stowell, Maria Luisa Zubizarreta, as well as the audiences at the GGS-Tagung in Bern, the 'Incontro di Grammatica Generativa' in Ferrara, and the University of Southern California. Preparation of this manuscript was supported by the Ministerium für Wissenschaft und Forschung of Austria.

2 Carlson (1977) distinguishes kinds from objects. Objects are entities like *John*, *John's car*, etc. Kinds, on the other hand, are entities like the species *dinosaur*, *beaver*, etc. Carlson distinguishes further kind-level predicates from individual-level predicates. In contrast to individual-level predicates like *intelligent*, which can express properties of kinds (1b) and objects (ii), kind-level predicates like *become extinct* can only express properties of kinds (1a) but not of objects (i):

i) *John became extinct
ii) John is intelligent

been widespread

c. John studied dinosaurs, which$_j$ became extinct although they$_j$ had been widespread

Let's exclude for the moment the existential interpretation of the bare plural object.

Both realizations of the bare plural *dinosaurs* in (2b) cannot be interpreted as generics at the same time. The reading "John studied the kind *dinosaur*, which became extinct although the kind *dinosaur* were widespread" is not available. An analysis that treats generic bare plurals as referential expressions excludes this interpretation of (2b) by Principle C of the Binding Theory: the second realization of the bare plural *dinosaurs* is not free, because it is coindexed with a c-commanding relative pronoun which is coindexed with the first realization of the bare plural. If, on the other hand, the second realization of *dinosaurs* is substituted by a pronoun, the relevant meaning is available (2c).

The same contrast shows up in (3). Nominal expressions that denote objects (like *John* in (3a)) cannot realize the internal argument of *exterminate*. The predicate exterminate s-selects kinds as its internal argument. (3b) shows that the external argument can denote a kind, too: the kind *black panthers* exterminated themselves. This reading is not available if the anaphor is substituted by the bare plural (3c)[3]. Under a referential analysis of generic bare plurals, the contrast between (3b) and (3c) is derived by Principle C.

(3) a. *Black panthers exterminated John

b. Black panthers$_j$ exterminated themselves$_j$

c. #Black panthers$_j$ exterminated black panthers$_j$

Crucially, the sentences in (4), which contain the predicates *adore* and *know*, contrast with the ones discussed above. Both sentences contain two realizations of the same bare plural in a c-command relation. All the bare plurals can have generic interpretation. (4a) for instance, can express the property of highlanders in general to adore the kind *highlander*; (4b) can express the property of women in general to be unaware of the fact that the kind *woman* is disadvantaged.

(4) a. Highlanders adore highlanders

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3 The only possible interpretation for the bare plurals in (3c), which is irrelevant for our discussion, is the existential interpretation: some subspecies of the kind *black panther* exterminated some other subspecies of the kind *black panther*. Obviously also the bare plural in (2b) allows existential interpretation: there are subspecies of dinosaurs which became extinct despite the fact that the kind *dinosaur* had been widespread, and John studied some of them. We use the sign # to indicate that the generic interpretation is not available.

b. Women do not know that women are disadvantaged

If generic bare plurals were always referential, the sentences in (4) should violate principle C, just as (2) and (3). But since they are grammatical, we have to conclude that at least one of each pair of bare plurals in (4a) and (4b) does not denote the kind *highlander* or *woman*, respectively. Therefore Carlson's analysis can only be maintained for the generic bare plurals in (2) and (3), but not for all the bare plurals in (4).

We assume that there are two different strategies for obtaining generic interpretation. First, nominal expressions can refer to kinds. The DP in (5a) carries a referential index corresponding to the kind *dinosaur*. Second, we will assume that generic bare plurals can be analyzed as quantified nominal expressions. In particular we will follow Diesing (1992), Kratzer (1988) and others, who assume that bare plurals are free variables that can be bound by adverbial quantifiers, such as *always*, *often*, *never*, etc., or by the phonetically unrealized generic quantifier GEN (5b).

(5) a. $[_{DP}$ dinosaurs$]_j$
b. GEN_x...$[_{DP}$ highlanders$]_x$...

A question arises regarding the referential status of adverbially quantified DPs. One could suppose that the DP *highlanders* in (5b) refers to the kind *highlander* in spite of adverbial quantification. In this way Carlson's view, that English bare plurals are always names of kinds, could be maintained. Such a hypothesis would be similar to Carlson's analysis of existential bare plurals. In Carlson (1977) the existential reading of bare plurals is obtained from an operator *R* and existential quantification over stages. The operator *R* maps the kind denoted by the bare plural to stages, i.e. space-time slices of that kind. Although in Carlson's analysis the bare plural *black panthers* in (6a) denotes the kind *black panthers*, it can get existential interpretation in the logical representation (6b): there exists a stage of the kind black panthers (i.e. some black panthers) which killed Tarzan.

(6) a. Black panthers killed Tarzan
b. E(s) [R(s,black panthers) and killed-Tarzan(s)]

Quantificational generic bare plurals could possibly be analyzed in an analogous way, maintaining Carlson's basic idea. We call this hypothesis the modified referential analysis of bare plurals. In the following sections we will discuss some arguments against this possibility. In particular, this hypothesis cannot be extended to other languages: German, Dutch and certain Italian bare plurals can have generic

interpretation, but crucially they cannot be construed as referential generic expressions.

1.3. German generic bare plurals. In German both bare plurals (7a) and definite plurals (7b) can have generic interpretation. Both the sentences in (7) can express the property of elephants having precious teeth.

(7) a. daß Elephanten wertvolle Zähne haben
that elephants precious teeth have
b. daß die Elephanten wertvolle Zähne haben
that the elephants precious teeth have

Although German bare plurals can have generic interpretation, they cannot denote kinds. The predicate *aussterben* in (8) is a kind-level predicate. In order to express that the species *dinosaur* is becoming extinct, the definite determiner is required (8b). The bare plural subject of (8a) is interpreted existentially: There are some subspecies

(8) a. #daß Dinosaurier dabei sind auszusterben
that dinosaurs are becoming extinct
b. daß die Dinosaurier dabei sind auszusterben
that the dinosaurs are becoming extinct

(7) and (8) differ with respect to two properties. First, the predicate in (7) is an individual-level predicate, while the one in (8) is a kind-level predicate. Second (7) is a context with non-specific time reference, whereas (8) is a context with specific time reference. Crucially, an adverbial quantifier cannot bind a nominal expression in contexts with specific time reference. The adverbial quantifier in (9a), a context of non-specific time reference, binds the bare plural subject. (9a) can be paraphrased with (9b). The bare plural subject in (9c), a context of specific time reference, cannot be interpreted as bound by *often*. (9d) is not a paraphrase of (9c).[4]

(9) a. Texans are often tall
b. Many Texans are tall
c. Spies often crossed the border yesterday

4 (9c) expresses that there were many events with spies crossing the border. This does not entail that many spies crossed the border.

d. Many spies crossed the border yesterday

We can explain the contrast in (8) if we assume that German bare plurals cannot denote kinds (10). The quantificational generic interpretation of the bare plural in (8a) is excluded because of specific time reference; the referential generic interpretation is excluded because of (10); therefore only existential interpretation is available.

(10) English bare plurals can denote kinds; German ones cannot

Since (11) is a context of non-specific time reference, the bare plural in (11a) can receive generic interpretation by adverbial quantification. But still, the interpretation of (11a) differs from that of (11b). (11a) does not express a property of the kind *insect* - unlike (11b) - but rather a generic property of the subspecies of the kind *insect*.

(11) a. daß Insekten nicht aussterben können
that insects not become-extinct can
b. daß die Insekten nicht aussterben können
that the insects not become-extinct can

A theory that does not distinguish at least two different kinds of generic interpretation cannot handle the interpretational contrast in (11).

In the following, we find further examples for the generalization (10). The subjects in (12) to (14), the internal argument in (15) and the prepositional complements in (16) to (18) denote a kind only when they are introduced by the definite determiner.

(12) a. #Diesen Bedingungen haben sich Dinosaurier nicht rechtzeitig angepaßt
to theses conditions have themselves dinosaurs not in time adapted
b. Diesen Bedingungen haben sich die Dinosaurier nicht rechtzeitig angepaßt
to these conditions have themselves the dinosaurs not in time adapted

(13) a. #daß Äpfel dabei sind vom Markt zu verschwinden
that apples are disappearing from the market
b. daß die Äpfel dabei sind vom Markt zu verschwinden

that the apples are disappearing from the market

(14) a. daß schwarze Panther gestern noch weitverbreitet waren
that black panthers yesterday still widespread were
b. daß die schwarzen Panther gestern noch weitverbreitet waren
that the black panthers yesterday still widespread were

(15) a. daß der Virus Panther ausgerottet hat
that the virus panthers exterminated has
b. daß der Virus die Panther ausgerottet hat
that the virus the panthers exterminated has

(16) a. Die Aktionen waren gegen Ausländer gerichtet
the actions were against foreigners directed
b. Die Aktionen waren gegen die Ausländer gerichtet
the actions were against the foreigners directed

(17) a. Hans hat auf Studenten geschimpft
Hans has about students complained
b. Hans hat auf die Studenten geschimpft
Hans has about the students complained

(18) a. Gestern hat der Skinhead auf Asylanten eine Wut gehabt
Yesterday has the skinhead against refugees an anger had
b. Gestern hat der Skinhead auf die Asylanten eine Wut gehabt
Yesterday has the skinhead against the refugees an anger had

1.4. Appositive modification. It is commonly assumed that non-restrictive modifiers can modify only referential nominal expressions. If, as we assume, German generic bare plurals cannot be construed as referential but only as quantificational, we expect them to be incompatible with non-restrictive modification. On the other hand, we expect German definite generics, which can be referential, to be compatible with non-restrictive modifiers. This prediction is fulfilled. The relative clause in (19a), modifying a generic bare plural, can only be restrictive, while in (19b), modifying a definite plural, it can be appositive. Note that according to German orthography relative clauses have to be marked with commas, regardless of whether they are restrictive or not.

(19) a. Studenten, die links sind, konsultieren das Kapital

students who leftwing are consult das Kapital
b. Die Studenten, die links sind, konsultieren das Kapital
the students who leftwing are consult das Kapital

Relative clauses containing the adverb *ja* ('certainly') are unambiguously non-restrictive. They are compatible with referential expressions such as proper nouns (20a), but not with quantificational expressions (20b).

(20) a. Hans, der ja links ist, konsultiert das Kapital
John who adv leftwing is consults das Kapital
b. *Jeder Student, der ja links ist, konsultiert das Kapital
every Student who adv leftwing is consults das Kapital

They cannot modify German generic bare plurals (21a), but can modify definite generic plurals (21b).[5]

(21) a. *Studenten, die ja links sind, consultieren das Kapital
students who adv leftwing are consult das Kapital
b. Die Studenten, die ja links sind, consultieren das Kapital
the students who adv leftwing are consult das Kapital

These facts support our claim that German generic bare plurals are not referential. English generic bare plurals, on the other hand, which can be referential, are compatible with restrictive (22a) and non-restrictive modification (22b).

(22) a. Students who are leftwing consult das Kapital
b. Students, who are leftwing, consult das Kapital

So far, we only have considered relative clauses. Adjectival modification reveals analogous contrasts in German. The adjective in (23a), modifying a generic bare plural, can not be non-restrictive; in (23b), on the other hand, modifying a definite generic plural, it can be non-restrictive.

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5 A relative pronoun can float a quantifier only if it heads an appositive relative clause. Therefore analogously to (21), (i) contrasts with (ii).

i) *Studenten, die alle links sind, consultieren das Kapital
students who all leftwing are consult das Kapital
ii) Die Studenten, die alle links sind, consultieren das Kapital
the students who all leftwing are consult das Kapital

(23) a. Linke Studenten consultieren das Kapital
leftwing students consult das Kapital
b. Die linken Studenten consultieren das Kapital
the leftwing students consult das Kapital

Interestingly, the same pattern shows up in English. When modifying a bare plural (24a), the adjective *leftwing* can only be restrictive. In order to interpret the adjective as an appositive, the determiner is necessary (24b). The same holds for the examples in (25), a context with a kind level predicate.[6]

(24) a. Leftwing students consult das Kapital
b. The leftwing students consult das Kapital

(25) a. Poor dinosaurs became extinct
b. The poor dinosaurs became extinct

Unlike appositive relative clauses, appositive adjectival modifiers do not give any direct support for the claim in (10). We suppose that there is an independent explanation for why appositive adjectives that modify common nouns require the definite determiner. The crucial fact for our purpose is that appositive relative clauses do not require the definite determiner in English (cf 22b). The generic reading is excluded when the definite determiner is present (26).

(26) #The students, who are leftwing, consult das Kapital

1.5 Conclusions. The modified referential analysis of bare plurals, outlined at the end of section 1.2, cannot be maintained for German and Dutch. As shown above, in these languages, bare plurals cannot refer to kinds in contexts with kind-level predicates. Thus it seems unreasonable to analyze them as names of kinds when they are bound by an adverbial quantifier. Rather it seems reasonable to consider German and Dutch bare plurals as indefinite singular nominal expressions.[7]

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6 Being restrictive, the adjective *poor* in (25a) has only the meaning of economically disadvantaged.

7 An English bare plural, on the other hand, can be both definite (when it refers to a kind) and indefinite (when it is bound by an adverbial quantifier or by existential closure (cf section 2). This classification of bare plurals is consistent with the definition of definiteness proposed by Vergnaud and Zubizarreta (1990):

> i) A nonpronominal nonpredicative nondeictic expression is definite iff two occurrences of that nominal expression within a sentence are necessarily coreferential
> (Vergnaud & Zubizarreta 1990:54)

(27) German (and Dutch) bare plurals are indefinite

Heim (1982) argues that indefinite singular nominal expressions introduce free variables that can be bound by adverbial quantifiers. Exactly like German and Dutch bare plurals, they cannot refer to kinds (28a), although they can have generic interpretation (28b).[8]

(28) a. #A dinosaur became extinct
b. A beaver is intelligent

Due to the quantificational character of their antecedents, the anaphors in (29a) and (29b) only have distributive interpretation, as in *every highlander admires himself*. Only in (29c), where its antecedent can be construed as referring to a kind, can the anaphor be interpreted as denoting the kind *highlander*.

In contrast to indefinite bare plurals, two occurrences of a definite bare plural are necessarily coreferent. Therefore, if they are in a relation of c-command, as in the examples (2b) and (3c) in section 1.2., a violation of Principle C arises.

8 Following Wasow (1977), Vergnaud & Zubizarreta (1990,1992) assume that only referential expressions can license cataphoric relations:

> i) A nominal expression that gives rise to the semantic intuition of "referentiality" licenses backward pronominalization, and reciprocally
> (Vergnaud & Zubizarreta 1990:6)

But, although we treated them as quantificational expressions, German generic bare plurals (ii) and generic indefinite singulars (iii) can license cataphoric relations.

> ii) Obwohl sie im allgemeinen viel Geld haben, werden Bauern für arm gehalten although they usually have much money, farmers are considered to be poor
> iii) Although he usually has much money, a farmer is considered to be poor

Therefore, we conclude, the concept of *referentiality* used in (i) is distinct from the one used in this article. Note further, that, contrary to the generalization in (i) even non-referential definite descriptions in the scope of a quantificational element can license backward pronominalization. The definite nominal expression *the car...* in (iv) does not denote a unique car, rather its meaning depends on the assignment to the variable bound by *everybody*. Nevertheless the pronoun *it* is cataphoric to this nominal expression. The same holds for (v) and (vi). For speakers who can interpret definite nominal expressions like *the tent* (v) and *the small car* (vi) distributively the pronoun can be cataphoric to these nonreferetial nominal expressions.

> iv) Since it can go any distance, everybody who has two cars prefers to take the car he filled with gas the day before
> v) All participants of our tour into the grand canyon have a tent at home. But, stupidly, although it can not be easily pitched in the canyon, many want to carry also the tent with them.
> vi) Since its consumptions is usually low, nearly everybody who has two cars prefers to use the small car in town

(29) a. Gebirgler bewundern sich selbst am meisten
highlanders admire themselves most
b. Ein Gebirgler bewundert sich selbst am meisten
a highlander admires himself most
c. Die Gebirgler bewundern sich selbst am meisten und schätzen die Flachländler gering
the highlanders admire themselves most and despise the lowlanders

2. Expletive determiners

Diesing (1992), modifying Heim's (1982) analysis of singular indefinite nominal expressions, argues for an analysis according to which the interpretation of bare plurals and indefinite nominal expressions in the singular is determined by their syntactic position. Existential interpretation occurs inside the VP, generic interpretation outside the VP. Bermann (1989) and Rullmann (1989) assume that adverbial quantifiers such as *always*, *often*, *never*, etc., and the phonetically unrealized generic operator GEN are adjoined to IP in Logical Form. Existential interpretation is brought about via a phonetically unrealized existential quantifier, which is adjoined to the VP in Logical Form ("existential closure"). Generic and existential interpretation are in complementary distribution.

(30) $[_{IP}\ Q_{adv}\ [_{IP}$ ..... E $[_{VP}$ .....]]

Relevant data for this hypothesis comes first of all from languages like German and Dutch. In these languages the complementary distribution of generic and existential indefinite nominal expressions shows up at Surface Structure. Certain adverbs like *wohl*, *ja doch*, etc. have been analyzed as being adjoined to VP (cf Webelhut 1989). Indefinites that precede such adverbs (31a) have only generic interpretation whereas indefinites that follow them, i.e. which stay inside the VP (31b), have only existential interpretation.

(31) a. daß Vögel ja doch $[_{VP}$ fliegen]
that birds adv. fly
b. daß ja doch $[_{VP}$ Vögel fliegen]
that adv. birds fly

Romance bare plurals constitute a further argument for the hypothesis. The

distribution of Romance bare plurals is more restricted than bare plurals in Germanic languages: they only stay in postverbal position.

(32) a. Gianni ha visto marocchini dappertutto
Gianni saw Moroccans everywhere
b. Sono arrivati marocchini in città
arrived Moroccans in town
c. In questo ufficio telefonano sempre marocchini
In this office call always Moroccans

The bare plural realizes the internal argument of a transitive verb in (32a), the internal argument of an ergative predicate in (32b), and an external argument in (33c). Romance bare plurals are excluded from preverbal argument positions such as the specifier of IP:[9]

(33) a. *Marocchini sono arrivati in città
Moroccans arrived in town
b. *Marocchini telefonano sempre in questo ufficio
Moroccans call always in this office

The contrasts between (32) and (33) can be derived from the ECP (Contreras 1986, Delfitto & Schroten 1991, Longobardi 1991). If one assumes that the internal structure of bare plurals is the one in (34a), i.e. that they are introduced by an empty determiner, and that the bare plurals in (32) occupy positions that are governed by the

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9 This contrast shows up only in argument positions (Longobardi 1991). Non-argument positions do not restrict the occurrence of Italian bare plurals:

i) Noccioline, ne ho comprate anch'io (Benincà 1980)
hazelnuts of-them have(1.sg) bought too I

Note that the preverbal bare plurals in (33) become acceptable if they are stressed (ii,iii) or modified (cf section 3.1).

ii) MAROCCHINI sono arrivati in città
iii) MAROCCHINI telefonano sempre in questo ufficio

Also, coordinated bare plurals can occupy preverbal positions (iv). This fact, however, as pointed out by Longobardi (1991), seems to be a general characteristic of coordination, rather than a specific property of bare plurals, since bare nouns in the singular can also be coordinated without being introduced by any determiner (v).

iv) Marocchini e Senegalesi sono arrivati
Moroccans and Senegalese arrived
v) Cane e gatto sono sempre nemici
Dog and cat are always enemies

verb, the contrasts between (32) and (33) follow from the ECP: empty categories have to be lexically governed (by V° or P°), and so do empty D°s (34b).[10]

(34) a. $[_{DP}$ e $[_{NP}$ marocchini]]
b. An empty head has to be lexically governed (Longobardi 1991:39)

The assumption in (30) correctly predicts the interpretational properties of Romance bare plurals. Since they are syntactically restricted to positions inside VP, they can only have existential interpretation.

In order to be interpreted by adverbial quantification, nominal expressions have to stay outside VP. According to (34b) the D° position of such nominal expressions cannot be empty and has therefore to be filled either lexically at deep structure or by movement. Romance and German generic plurals (35) allow for the first option: D° can be lexically filled by the definite plural determiner.

(35) a. I castori sono intelligenti
the beavers are intelligent
b. daß die Biber intelligent sind
that the beavers intelligent are

Italian and German definite plurals can be ambiguous between a between a specific and a generic interpretation. The sentences in (35) can either express a property of a specific group of beavers or of beavers in general. Higginbothom (1985) and Di Sciullo & Williams (1987) assume that nouns can select for a non-thematic external argument *R*, which can be satisfied either by predication (36a), by quantification (36b), or by a determiner (36c).

(36) a. John is a man
b. All men ate a cake
c. The man ate a cake

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10 Following Chomsky (1986) we suppose that external arguments are base generated inside the VP. Data regarding extraction indicate that this position is governed by the verb (cf section 3.3). However, there is a difference between external arguments and internal arguments. A bare plural that realizes the external argument requires the presence of an element like an adverbial quantifier (such as *sempre* in (32c)). Without this element (i), the sentence becomes worse (Brugger 1990). This is the reason why the examples in (73-76) in section 3.3 contain adverbial quantifiers.

i) ??In questo ufficio hanno telefonato Marocchini
In this office called Moroccans

When the definite determiner satisfies the nominal argument *R*, the specific reading arises. Following Heim (1982), we want to assume that *R* can be satisfied by adverbial quantificaton. Therefore a definite determiner which introduces a quantificational generic nominal expression functions semantically and syntactically as an expletive: semantically, because it does not bind *R*; syntactically because its presence is required by syntactic principles (e.g. by (34b)).

This view of generic definite plurals as adverbially quantified variables differs from the analysis proposed by Vergnaud & Zubizarreta (1990,1991,1992) and Longobardi (1991). Extending Carlson's (1977) analysis of English bare plurals to Romance, the authors analyze Romance generic definite plurals as referential expressions that refer to kinds. In the following we briefly discuss a view arguments in favor of the quantificational analysis. First, generic definite plurals can be bound by overt adverbial quantifiers. Kratzer (1988) assumes that individual-level predicates like *tall* differ from stage-level predicates like *available* in their argument structure: stage-level predicates select an implicit temporal argument which can be bound by an adverbial quantifier, as in (37a). Individual-level predicates, on the other hand, do not select such an argument. (37b) is excluded because the adverbial quantifier has no variable to bind.

(37) a. John is often available
b. *John is often tall

(38a) contrasts with (37b). We assume that in this case the adverbial quantifier has a variable to bind: the variable introduced by the subject. (38a) can be paraphrased with *many beavers are tall.* Further, since in contexts with specific time reference, the quantificational generic interpretation is not available (cf section 1.2), the definite plural in (38b) only has a specific interpretation.[11]

(38) a. I castori sono spesso alti
the beavers are often tall
b. I castori sono entrati
the beavers came in

Second, if definite generic plurals were unambiguously referential, (39)

11 As we will see in section 3.4, the definite plural in (38b) may have a kind-interpretation.

should be excluded by principle C, but it is not.[12] [13]

(39) I montanari adorano i montanari
the highlanders adore the highlanders

English definite plurals contrast with Romance and German definite plurals in that they cannot have generic interpretation. (40) only expresses a property of a specific group of beavers.

(40) The beavers are intelligent

The concept of expletive determiner was originally introduced by Vergnaud & Zubizarreta (1990,1991) and Longobardi (1991). They assume a parametric variation

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12 Bare plurals modified by stage-level predicates like *wounded* or *invited* can have generic interpretation.

i) Wounded tigers can be dangerous
ii) Invited students usually arrive late

Following Carlson (1977) the bare plurals refer to the kinds *wounded tiger* and *invited student*. But interestingly, these nominal expressions cannot enter in kind-level contexts (the contrast between (i) and (iii) has been noticed by Vergnaud & Zubizarreta 1990):

iii) *Wounded tigers became extinct
iv) *Invited students are widespread

One could suppose, in contrast to Carlson (1977), that there are no such kinds like *wounded tiger* and *invited student* in the domain of reference. Therefore (iii) and (iv) would be excluded because the bare plurals fail to refer, whereas the bare plurals in (i) and (ii) would receive their generic interpretation by adverbial quantification. Crucially, this assumption is incompatible with both Carlson's original hypothesis that bare plurals are always names of kinds, and the modified referential analysis of bare plurals outlined at the end of section 1.2. Consequently, the corresponding Romance generic definite plurals (v,vi) cannot be analyzed as referring to a kind either. They can only be analyzed as bound by adverbial quantification.

v) Le tigri ferite possono essere pericolose
The tigers wounded can be dangerous
vi) Gli studenti invitati in genere arrivono in ritardo
The students invited in general arrive late

13 Although definite plurals can be bound by adverbial quantifiers, they cannot be bound by existential closure. Only the bare plural in (i), but not the definite plural in (ii) has existential interpretation.

i) Gianni ha mangiato mele
John ate apples
ii) Gianni ha mangiato le mele
John ate the apples

between English, on the one hand, and Romance and German, on the other hand: the English plural determiner cannot function as an expletive, whereas the German and Romance ones can (41). Therefore the definite plural in (40) only has the specific reading.[14]

(41)	definite determiner	English	Romance	German
	can be expletive	-	+	+

The variation in (41) is attributed to the agreement properties of the determiner. A definite determiner is licensed only if it expresses semantic content or grammatical features (cf Longobardi 1991:55, Vergnaud & Zubizarreta 1992:6). Since the English determiner does not host grammatical features it cannot function as an expletive.[15] The position D° of a nominal expression in the scope of adverbial quantification has to be filled because of the ECP. D° can be filled lexically at Deep Structure by an appropriate determiner (as discussed in the preceding section), or at a later level by movement. Delfitto & Schroten (1991) and Longobardi (1991) propose that the position of the determiner of a bare plural can be filled in Logical Form in English, German and Dutch but not in Romance (42). Delfitto & Schroten (1991) suppose that the plural morpheme can excorporate and raise to D°. Following Longobardi (1991),

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14 In contrast to definite plurals, definite nominal expressions in the singular can have generic interpretation in English (i), just as in Romance (ii).

i) The beaver is intelligent
ii) Il castoro è intelligente

The question whether the English singular determiner in contexts like (i) should be analyzed as expletive or not is still a matter of discussion. Whereas Longobardi (1991) suggests that the definite singular determiner in (i) functions as an expletive, Vergnaud & Zubizarreta (1991) argue that the singular articles of the Romance languages, but not the English one, can be considered as expletives. I do not want to address the problem of definite generic singular nominal expression in this article. The parameter (41) therefore is meant to apply only to plurals and mass nouns. Mass nouns behave like plurals although they are morphologically singular (Longobardi 1991, Vergnaud & Zubizarreta 1990,1991). In order to express a generic property, a mass noun has to be introduced by the determiner in the Romance languages (iv) but not in English (iii). In German the determiner is optional (v).

i) Milk is white
ii) Il latte è bianco
iii) (Die) Milch ist weiß

15 In addition to the Romance languages, also German, Dutch, Greek and Frisian also support this observation. In a footnote Vergnaud & Zubizarreta (1990,fn:40) sustain that the definite determiner, when used as an expletive, cannot be omitted because it has to realize morphological features. This hypothesis is however falsified by e.g. German and Dutch generic bare plurals.

N° can raise to D°, if N° is not a common noun in the singular.[16]

(42) D° can be filled in LF
* Italian
ok English
ok German/Dutch

If the D° position of German, Dutch and English bare plurals can be filled in Logical Form, German, Dutch and English bare plurals can be interpreted in ungoverned positions by adverbial quantification ((43a),(31a) here repeated under (43b)).[17]

(43) a. Students are lazy
b. daß Vögel ja doch fliegen
that birds adv fly

The mechanism outlined above does not account for the necessity of the determiner in (44c). The English bare plural in (44a) is ambiguous between an existential and a generic interpretation, which is obtained by reference to a kind and not by adverbial quantification. In Italian these two readings are expressed in two

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16 Mass nouns can be interpreted by existential closure (i) and by adverbial quantification (ii,iii). We assume that the variable introduced by *milk* ranges over quantities of milk.

i) John drank milk
ii) Milk is white
iii) Milk is never green

The mass noun in (ii) and (iii) occupies an ungoverned position. Longobardi (1991) assumes that mass nouns, like plural nouns, can raise to D° in Logical Form. Delfitto & Schroten (1991) suppose that mass nouns have a phonetically unrealized inflectional morpheme that can excorporate from the head and raise to D°. Evidence for this morpheme can be found in some Romance dialects.

17 Although the subjects of the small clauses in the following examples occupy governed positions, the Italian bare plural (i) is excluded. The indefinite singular (ii) and the English bare plural (iii) have generic interpretation.

i) *Ritengo cavalli furbi
(I) consider horses clever
ii) Ritengo un cavallo furbo
I consider a horse clever
iii) I consider firemen intelligent

We assume that the head of the small clause incorporates to the matrix verb at Surface Structure in German (cf Prinzhorn 1990) and at Logical Form in English and Italian. In this way the embedded subjects in (i-iii) can adjoin/scramble to the matrix VP at LF where they are bound by the generic quantifier. Since they do not occupy governed positions at LF, (i) is excluded because the empty D° of the Italian bare plural violates the ECP at LF.

different ways: the existential interpretation with the bare plural (44b), the generic interpretation with the definite plural (44c).

(44) a. The virus exterminated [$_{DP}$ e [$_{NP}$ black panthers]]
b. Il virus ha sterminato [$_{DP}$ e [$_{NP}$ pantere nere]]
c. Il virus ha sterminato [$_{DP}$ le [$_{NP}$ pantere nere]]

The obligatory presence of the definite determiner in (44c) does not follow from principles already discussed, because the internal argument stays in a governed position. We want to assume that a nominal expression that denotes a kind has to be introduced by the definite determiner, when the definite determiner can function as an expletive. In (45) this hypothesis is formulated in terms of Earliness.

(45) DP denotes a kind --> D° must be filled as early as possible

The D° of an English plural which denotes a kind cannot be filled prior to Logical Form, because the definite determiner does not function as an expletive. The D° of an Italian plural can be filled at Deep Structure by the expletive determiner. Following (45), D° has to be filled at Deep Structure. The definite determiner in (44c) therefore is obligatory. Crucially, (45) derives the generalization (10) that German bare plurals cannot denote kinds.[18]

One could suppose that referential nominal expressions, and therefore nominal expressions that refer to kinds, in general stay outside VP at least at LF. Therefore D° of the plurals in (44a) and (44c) would have to be filled because of the syntactic position of the whole nominal expression, and not because of (45). Note first, that under this hypothesis it remains unexplained why the D° of German and Dutch plurals that denote kinds has to be filled lexically; however, explained why D° has to be filled would be explained. Therefore, (45) cannot be completely derived from (34b). Second, the referential generic plurals in (46) seem to stay inside VP at

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18 German bare mass nouns can not denote kinds, too. Although German generic mass nouns can be introduced by the definite determiner (cf fn.15), the bare mass noun in (i) has only existential interpretation: some quantities of milk disappeared from the market. In order to express that the whole kind *milk* disappeared, the definite determiner must be present (ii).

i) #daß Milch vom Markt verschwunden ist
that milk from the market disappeared
ii) daß die Milch vom Markt verschwunden ist
that the milk from the market disappeared

Surface Structure. They can follow VP adverbs (46a) and can be topicalized within the VP (46b). Since German does not allow scrambling at Logical Form (cf Kratzer 1989), such a hypothesis seems to be problematic.

(46) a. daß der Virus wohl die schwarzen Panther ausgerottet hat
that the virus adv. the black panthers exterminated has
b. [$_{VP}$Die schwarzen Panther ausgerottet] hat der Virus noch nicht
the black panthers exterminated has the virus not yet

3. Lowering

3.1. Italian modified bare plurals. English bare plurals in the specifier of IP can have existential interpretation (47). Kratzer (1988) and Diesing (1992) propose that English bare plurals that stay outside the VP at Surface Structure can be "lowered" or "mapped" to their base position inside the VP at Logical Form in order to receive existential interpretation. In this way "the effects of NP movement can be optionally undone" (Kratzer 1989:24).

(47) Students occupied the library

In order to explain the fact that German and Dutch bare plurals in positions outside the VP at Surface Structure, including the specifier of IP, cannot be interpreted existentially (cf contrast in (31)), the authors assume that the process of lowering is not available in these languages.

(48)	English	German/Dutch
lowering	+	-

In other words, in German and Dutch, but not in English, the position a bare plural occupies at Surface Structure is relevant for its interpretation.

Having enriched the framework with the process of lowering, additional assumptions are necessary in order to exclude existential bare plurals in ungoverned positions in Italian. In order to exclude (33a), repeated under (49a), it must be assumed either that lowering is not available in Italian or that Italian empty D°s must be governed at Surface Structure (49b).

(49) a. *Marocchini sono arrivati in città
b. In Italian: no lowering and/or (34b) at SS

Otherwise the syntactic movement of the bare plural could be "undone" at LF, and inside the scope of existential closure the empty D° would be governed. Both the assumptions in (49b) are problematic. First, in addition to the specific interpretation, indefinite singular NPs in [SPEC,IP], like *uno studente* in (50a), can have existential interpretation.

(50) a. Uno studente ha occupato la biblioteca
A student occupied the library

If we assumed that Italian lacks lowering, the existential reading would be excluded. Longobardi (1991), on the other hand, proposes that (34b) applies at Surface Structure (51)

(51) Condition [(34b)] on empty D°s is checked as early as possible (cf Longobardi 1991:42)
In Italian: Surface Structure

Interestingly, modified bare plurals (52b) in ungoverned positions contrast with unmodified ones (e.g 52a). Modified bare plurals can, in a particular narrative style, surface in preverbal position (cf Delfitto & Schroten 1991, Longobardi 1991).

(52) a. *Politici hanno occupato la biblioteca
politicians occupied the library
b. Politici corrotti hanno occupato la biblioteca
politicians corrupt occupied the library

As opposed to unmodified bare plurals (cf fn.10), modified bare plurals in ungoverned positions do not need to be specially stressed. Unmodified bare plurals are contrastive. Only the bare plurals, but no other element in (53), can be contrastively focused. In (54), on the other hand, an element other than the modified bare plural can be contrastively focused.

(53) a. *Marocchini sono ARRIVATI, non PARTITI
Moroccans arrived not left
b. MAROCCHINI sono arrivati, non AUSTRIACI
Moroccans arrived not Austrians

(54) Politici corrotti hanno occupato la BIBLIOTECA, non il MAGGAZZINO
corrupt politicians occupied the library not the supermarket

If one assumes that the D° position of modified bare plurals is filled by some element, the contrast between (52a) and (52b) follows from the ECP. Following (51) D° has to be filled prior to LF. Proper nouns modified by a restrictive modification have to be introduced by a determiner (55). As suggested by Longobardi, it might be the case that a restrictive modification which modifies a bare plural assigns features to D°, or that it licenses a lexical determiner which is phonetically unrealized, just as proper nouns that are modified by a restrictive modification have to be introduced by a lexical determiner (55).

(55) a. The John/*John I met yesterday
b. Il Gianni/*Gianni che ho visto ieri

Crucially this invisible element in D° cannot be analyzed as an existential quantifier, because modified bare plurals allow generic interpretation (56). Following Heim (1982), we analyze determiners which can change their quantificational properties according to the context, like chameleons change their color, as determiners with no quantificational force at all. The modified bare plural in (56) receives generic interpretation by adverbial quantification.[19]

(56) Cani con tre zampe non possono ballare
dogs with three legs not can dance

Although modified bare plurals allow generic interpretation, they cannot refer to a kind. Let's assume that in earlier times there existed a species of dog with only three legs. (57a) cannot express the meaning that this species became extinct. The definite determiner is required (57b).

(57) a. #Cani con tre zampe si sono estinti
dogs with three legs became extinct
b. I cani con tre zampe si sono estinti
the dogs with three legs became extinct

One could assume that the invisible determiner-like element that introduces modified bare plurals is an indefinite determiner. But notice that it has no corresponding overt lexical determiner. Neither does it correspond to the indefinite

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19 If the invisible determiner itself does not quantify, the existential interpretation of the bare plural in (52b) can only be obtained by existential closure. Therefore (52b) constitutes a further argument for the hypothesis that lowering is available in Italian.

plural determiner *dei/delle*, nor can it be analyzed as a plural form of the indefinite singular determiner *un/una*. Nominal expressions introduced by one of these determiners and modified bare plurals are similar in that they cannot denote kinds (58)

(58) a. #Delle balene si sono extinte
of the whales became extinct
b. #Una balena si è estinta
a whale became extinct

However they differ with respect to scope. Nominal expressions introduced by overt indefinite determiners can be interpreted as having wide scope over other operators. The indefinite singular in (59a) can have a specific interpretation. The modified bare plural in (59b) cannot.

(59) a. Ognuno ha visto un politico corrotto
Everybody saw a politician corrupt
d. Ognuno ha visto politici corrotti
Everybody saw politicians corrupt

The wide scope interpretation can be forced with elements like *ciascuno*. But this element is only compatible with nominal expressions that are introduced by an overt determiner (60a), not with modified bare plurals (60b).

(60) a. Delle ragazze hanno comprato due regali ciascuna
of the girls have bought two gifts each
b. *Politici corrotti hanno bocciato due leggi ciascuno
politicians corrupt blocked two laws each

One of the basic generalizations of Carlson (1977) is that bare plurals with existential interpretation always have narrowest scope. The modification does not change the scopal properties of a bare plural neither in Italian (59,60), nor in German or English (61):

(61) a. Everybody saw politicians
b. Everybody saw corrupt politicians

Therefore its seems unreasonable to assign a completely different structural representation to modified bare plurals. Rather it seems reasonable to treat bare plurals and modified bare plurals alike. If English and German bare plurals can

occupy ungoverned positions because their D° position can be filled in Logical Form, it seems reasonable to assume the same for Italian modified bare plurals.

(62) a. D° of modified bare plurals is filled at LF [20]
b. Condition (34b) on empty D°s is checked at LF in Italian

Now the contrast in (57) follows from (45). Since the definite determiner in Italian can function as an expletive, the D° of a modified bare plural referring to a kind must be filled prior to LF.

We want suggest that existential closure can bind both the nominal expressions in its scope (the VP), or the traces ("copies" in (Chomsky 1992)) left in its scope after syntactic movement of the nominal expression. In this way, a nominal expression in an ungoverned position with existential interpretation does not literally "lower" or "map" to a governed position. Instead the trace/copy is existentially bound. The position at Surface Structure still remains visible to the ECP at Logical Form. Since D° must be filled at this level, unmodified Italian bare plurals are excluded form ungoverned positions, unlike modified Italian bare plurals and English and German bare plurals.

3.2. Exceptions of the indefiniteness restriction. Diesing assumes on the basis of German data discussed in (31) that German lacks lowering at Logical Form: the relevant position of interpretation of German indefinites is supposed to be the position at Surface Structure. In this section we are going to discuss evidence suggesting that this assumption is not correct.
Dutch indefinite subjects are subject to the so called *indefiniteness restriction* (Reuland 1988, Rullmann 1989): indefinite subjects with existential interpretation have to be preceded by the particle *er* (63)

(63) indefiniteness restriction
*(er) indefinite subject with existential interpretation

Generic indefinites, on the other hand, are incompatible with *er*. The indefinite singular in (64a) has only existential interpretation. In absence of *er* existential interpretation is excluded. The subject in (64b) can have generic interpretation.

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20 The question arises, as to what element fills the position D° of modified bare plurals at LF. We adopt Delfitto & Schroten's (1990) proposal that the modification licenses movement of N° to D° at LF, although we can not adopt their motivation.

(64) a. dat er een jongen werkt (Bennis,1985)
that ER a boy works
b. dat een jongen werkt
that a boy works

The same contrasts show up with bare plurals. Because of specific time reference, only existential interpretation is available for the bare plural in (65a). The particle *er* is obligatory. Indefinite subjects of individual level predicates like *tall*, *intelligent*, etc. cannot have existential interpretation (cf Kratzer 1988, Diesing 1992, or Brugger 1990 for an alternative explanation). The only interpretation available for the bare plural in (65b) is generic interpretation. Therefore *er* is excluded.

(65) a. dat *(er) mensen dronken waren (Rullmann,1989)
that ER people drunk were
b. dat (*er) brandweermannen lui zijn
that ER firemen lazy are

Rullmann (1989) assumes that *er* and generic subjects occupy the same position: the specifier of IP. Existential subjects are assumed to stay inside VP. Adverbs like *gisteren* can only precede (66a), but not follow existential subjects (66b,c). The subjects in (66b,c) are only acceptable with exceptional stress.

(66) a. dat er gisteren studenten gearresteerd zijn
that ER yesterday students arrested were
b. *?dat er studenten gisteren gearresteerd zijn
that ER students yesterday arrested were
c. dat studenten gisteren gearresteerd zijn
that students yesterday arrested were

Rullmann (1989) discusses several exceptions to the *indefiniteness restriction*. One of them is contexts with transitive predicates (cf also Bennis 1985). In contexts with a realized object, especially when it is definite, *er* is excluded, even if the subject is an existential indefinite (67).

(67) a. *?dat er iemand Piet geholpen heeft
that ER somebody Piet helped has
b. ??dat er iemand het huis bekeken heeft
that ER somebody the house controlled has

The judgments of (67) are explained if we assume that the subjects are realized

in the specifier of IP conflicting with *er*, which is supposed to occupy the same position. This assumption is strengthened by adverb position. Existential subjects precede adverbs like *gisteren* in contexts with a definite object(68). In order for the subject to follow the adverb, it has to be specially stressed (Rullmann 1989). The same seems to occur in German (69).

(68) dat studenten gisteren de bibliotheek bezet hebben
that students yesterday the library occupied have
(Rullmann,1989)

(69) daß Studenten gestern die Bibliothek besetzt haben
that students yesterday the library occupied have

The difference between (67), (68) and (69) with respect to (64), (65) and (66) seems to lie in the presence of the definite object. Let's therefore assume (70).[21]

(70) If the internal argument is realized inside VP, the external argument has to be realized outside VP in S-structure

This assumption is obviously incompatible with Diesing's proposal on lowering in German and Dutch. Standard tests for the position of nominal elements, which normally show that the existential subjects in (64) to (66) are VP-internal at Surface Structure, show otherwise when a definite Object is realized inside the VP. Since it cannot be taken as guaranteed that existential subjects always surface in their base position, we will assume, contrary to Diesing (1992), that German does have

21 (70) does not describe the phenomenon exhaustively. In addition to definite objects, prepositional arguments and indefinite internal arguments - even though in a weaker way - can also have the same effect. The purpose of this section is only to isolate a precise context allowing existential subjects to stay outside the VP in German and Dutch. We do not consider (70) to be a universal generalization, but, as we will soon see, data that support (70) can also be found in some Romance languages.

lowering.[22]

Data involving *was für*-split supports the generalization in (70). The wh-element *was* is extracted from the nominal expression *was für Frauen* in (71), and moved to the specifier of CP. The remainder, consisting of the trace of the wh-element and *für Frauen*, has to stay in a governed position at Surface Structure. The internal argument *was für Frauen* in (71a) stays inside the VP, *was für*-split is possible. In (71b) on the other hand, the internal argument, preceding the external argument, occupies a position outside the VP, *was* cannot be extracted.

(71) a. Was haben die Ameisen [t für Frauen] gebissen
what have the ants (S) for women (O) bitten
Which women did the ants bite
b. *Was haben [t für Frauen] die Ameisen gebissen
what have for women (O) the ants (S)bitten

External arguments can undergo *was für*-split, too. In (72a) the internal argument precedes the external one, from which the wh-element has been extracted. Crucially, (72a) contrasts with (72b). This fact, noticed by Kratzer (1988), does not follow from the linear order of the constituents. Linear order does allow an analysis of the subject as occupying a governed position.

(72) a. Was haben die Mutter [t für Ameisen] gebissen
what have the mother (O) for ants (S) bitten
Which ants bit the mother
b. *Was haben [t für Ameisen] die Mutter gebissen
What have for ants (S) the mother (O) bitten
(Kratzer 1988)

The contrast instead follows from (70). Because of the definite object inside the VP the subject is ungoverned. Notice that, if the object is realized outside the VP, as

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22 Something has to be said now about general restrictions on when nominal expressions can be lowered at LF. Following Diesing's (1992) basic intuition, lowering is excluded in German because of free word order. In contrast to English subjects, which receive nominative case in the specifier of IP, German and Dutch subjects can also be case marked in their base position (cf e.g. Den Besten 1983). Therefore German subjects need not raise to the specifier of IP in order to receive case. If we assume that an element can be lowered only if it is forced to leave the VP, the different behavior of indefinite subjects of monoargumental predicates and transitive predicates follows: subjects of transitive predicates have to raise to the specifier of IP because of (70) and can therefore be lowered into their base position. This assumption, however, which could easily be formulated in terms of *Earliness*, is not free of counterexamples, which we will not discuss in this article.

in (72a), the subject can stay inside the VP.[23]

(70) is not to be understood as an exhaustive and complete description of the distribution of German and Dutch subjects (cf fn.22), nor as universally valid. But interestingly, data that may support (70) can also be found in some Romance languages. Consider for example the contrast between (73b) and (73c). In (73c) where the clitic-left dislocated object is realized outside the VP, the subject can be realized inside the VP, where the government requirement for empty D°s can be fulfilled. In (73b), on the other hand, where the object stays inside VP, the bare plural subject - according to (70) cannot be realized inside the VP, giving rise to an ECP violation. The same holds for the contrast between (74a) and (74b).

(73) a. Siempre ocupan los estudiantes la biblioteca
always occupy the students the library
b. ??Siempre ocupan estudiantes la biblioteca
always occupy students the library
c. La biblioteca siempre la ocupan estudiantes
the library always cl occupy students

(74) a. Siempre leen los estudiantes este libro
always read the students this book
b. ??Siempre leen estudiantes este libro
always read students this book

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23 Contexts with *es* insertion in German (the pleonastic element *es* is inserted in the specifier of CP) may be interpreted as further evidence for (70). Cardinaletti (1990) argues that this element is not base generated in the specifier of CP, but raises to this position from the specifier of IP. This hypothesis can account for the following contrast. A bare plural in a sentence introduced by *es* can only have existential interpretation (i) but not generic interpretation (ii). Kratzer (1988) assumes that the subject of individual-level predicates like *tall* has to be realized in [SPEC,IP]. But, if *es* is coindexed with a trace in [SPEC,IP], as proposed by Cardinaletti, this position is not available for the subject in (ii).

i) Es sind Biber anwesend
ES are beavers present
ii) *Es sind Biber groß
ES are beavers tall

The existential subject in (i) does not conflict with the trace of *es*. But, crucially for (70), when a definite object is present, insertion of *es* becomes ungrammatical.

(c) *Es hat ein Mann das Haus gebaut
ES has a man the house built

An analogous argument can be construed with VP-topicalization. Although indefinite subjects can be topicalized within the VP, they cannot when the VP contains a definite object. We won't go into further detail.

c. Este libro siempre lo leen estudiantes
this book always cl read students

Note, that Spanish, in contrast to Italian, has VSO (73a,74a). Along the lines of Zubizarreta (1992), one could assume that Spanish has an additional position for the (definite) subject, external to the VP but following the verb in Surface Structure. Italian then would lack this position. As predicted by (70) indefinite subjects can be realized inside VP only if no object is realized inside VP (75,76).

(75) a. *Occupano sempre Marocchini la biblioteca
Occupy always Moroccans the library
b. La biblioteca, la occupano sempre Marocchini
The library cl occupy always Moroccans

(76) a. *Leggono sempre studenti questo libro
Read always students this book
b. Questo libro lo leggono sempre studenti
This book cl read always students

3.3.A further kind-level context. If we analyze VP-external existential DPs as lowering, we expect elements intervening between the surface position and the base position to block lowering. Negation is one such element. Consider the contrast in (77). Although (77a) is acceptable (modified bare plurals can occupy ungoverned positions in Italian), (77b), with negation, is ungrammatical.

(77) a. Politici corrotti hanno occupato la biblioteca
b. *Politici corrotti non hanno occupato la biblioteca
politicians corrupt not occupied the library

The same contrast shows up in German.[24]

(78) a. daß Studenten die Bibliothek besetzt haben
b. *daß Studenten die Bibliothek nicht besetzt haben
that students the library not occupied have

If we assume (79), (77b) and (78b) become ungrammatical because the bare

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24 (77b) and (78b) become acceptable if the bare plurals are exceptionally stressed.

plural subjects do not receive any interpretation.

(79) NEG blocks lowering

If negation blocks lowering, the bare plurals cannot be interpreted in the scope of existential closure (with narrow scope with respect to negation). Second, because of time-reference, adverbial quantification is not available (cf section 1.3); the bare plurals cannot be bound by GEN. Third, since bare plurals always have "narrowest scope" (Carlson 1977), they cannot be interpreted with wide scope with respect to negation. The variable introduced by the bare plurals in (77b) and (78b) fails to be bound, causing an ungrammatical logical representation. Note that indefinite singulars, which can either be specific or non-specific as in (80a), can only have the specific interpretation in contexts like (80b) where negation is present.[25]

(80) a. Un politico corrotto ha occupato la biblioteca
a politician corrupt occupied the library
b. Un politico corrotto non ha occupato la biblioteca
a politician corrupt not occupied the library

(81) contrasts with (77b) and (78b). The definite plurals are ambiguous. They can either denote a specific group of individuals or, crucially, refer to a kind. Under the latter interpretation (81a) expresses that the kind *corrupt politician* did not occupy the library, without referring to any specific group of corrupt politicians.

(81) a. I Politici corrotti non hanno occupato la biblioteca
the politicians corrupt not occupied the library
b. daß die Studenten die Bibliothek nicht besetzt haben
that the students the library not occupied have

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25 Indefinite singulars with existential interpretation cannot stay inside the scope of negation even at Surface Structure. The indefinite object in (ii) can not have existential interpretation unless it is contrastively focused.

i) John ate an apple
ii) John did not eat an apple

We assume that indefinite singulars, and bare plurals, cannot be lowered because they are incompatible with negation. In this article, we cannot discuss the implications and apparent counterexamples of this assumption (cf: Brugger & Poletto (in progress).

The contrast between (77b) and (78b), on the one hand, and (81), on the other hand, constitutes further evidence for our claim that German and Romance bare plurals cannot refer to kinds. The only possible interpretation for the bare plurals in (77b) and (78b) would be reference to kind. But, since German and (modified) Romance bare plurals cannot be construed as referring to kinds, they are excluded from these contexts. The definite determiner is required, as shown in (81). English bare plurals, on the other hand, which can refer to kinds, are compatible with these contexts (82a). Note that since the definite determiner in English does not function as an expletive, the definite plural in (82b) unambiguously denotes a specific group of individuals.

(82) a. Students did not occupy the library
b. The students did not occupy the library

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REFERENCE RESOLUTION BY CONTEXTUAL REASONING FROM GRAMMATICAL REPRESENTATIONS WITH GETA_RUN

Dario BIANCHI, Rodolfo DELMONTE, Emanuele PIANTA, Sandra SARTORI

Università di Venezia

1. The Foundations

The topic of this paper is the theoretical foundations and the results of a system for text analysis and understanding called GETA_RUN, developed at the University of Venice, Laboratory of Computational Linguistics, Department of Linguistics and Language Teaching Theory. The main tenet of the theory supporting the construction of the system is that it is possible to reduce access to domain world knowledge by means of *contextual reasoning*, i.e. reasoning triggered independently by contextual or linguistic features of the text.

It is sensible to assume that when understanding a text a human reader or listener does make use of his encyclopaedia parsimoniously. Contextual reasoning is the only way in which a system for Natural Language Understanding should tap external knowledge of the domain. In other words, a system should be allowed to perform an inference on the basis of domain world knowledge when needed and only then. In this way, the system could simulate the actual human behaviour in that the access to extralinguistic knowledge is triggered by contextual factors independently present in the text and detected by the system itself.

It is also our view that humans understand texts only whenever all the relevant information is supplied and available. Descriptive and narrative texts are usually self-explanatory - not so, literary texts - in order to allow even naive readers to grasp their meaning. Note that we are not here dealing with spoken dialogues, where a lot of what is meant can be left unsaid or must be implicitly understood.

In the best current systems for natural language understanding (see the Proceedings of the ANLP'92, and the tutorial on Fully Implemented Natural Language Understanding System), linguistic components are kept separate from knowledge representation, and work which could otherwise be done directly by linguistic analysis is duplicated by the inferential mechanism. Linguistic representation is usually mapped onto a logical representation which is in turn fed onto the knowledge representation of the domain in order to understand and validate a given utterance or query.

Thus the domain world model must be priorly built, usually in view of a given task the system is set out to perform. However, it is clear that this modelling is domain and task limited and no generality whatsoever is achieved from it. In some of these systems, the main issue is how to make the two realms interact as soon as possible in order to take advantage of the inferential mechanism to reduce ambiguities present in the text or to allow for reasoning on linguistic data, which otherwise couldn't be understandable.

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We assume that an integration between linguistic information and knowledge of the world can be carried out at all levels of linguistic description and that contextual reasoning can be thus performed on the fly rather than sequentially. This does not imply that external knowledge of the world is useless and should not be provided at all: it simply means that access to this knowledge must be filtered out by the analysis of the linguistic content of surface linguistic forms and the abstract representations of the utterances making up the text.

As we said, the task we are faced with when trying to simulate human understanding of texts is to scientifically isolate the contexts in which external knowledge of the world should be made available to the system, as well as providing the tools to deal with this task adequately. There is a description of our task which deserves quoting, and is taken from P.Bosch contribution to a book by Herzog & Rollinger(eds.), **Text Understanding in LILOG**, which we take to be the best example of the attempt to come to terms with the problem at hand. In his paper, the author makes the point of what he takes to be the main problem to be tackled: i.e. identifying in a text "inferentially unstable" concepts which are to be kept distinct from "inferentially stable" ones. The latter should be analysed solely on the basis of linguistic description, while the former should tap external linguistic knowledge of the world. Before entering into a comment of this issue, we would like to quote from his Conclusions:

"The central point of this paper is to try to give a direction to work on the interaction of linguistic analysis and knowledge representation in knowledge-based NL Systems. I have tried to argue and to demonstrate that without a full linguistic analysis there is little hope that we shall ever have reasonably general and portable language modules in NL systems. It has also become clear, I hope, that this is not a trivial task but requires a decent amount of empirical research for many years to come. But the linguistic research required is not isolated research in pure linguistics, but close cooperation with work on knowledge representation and - although this is a point I have not argued for - psychological work on conceptual systems, is imperative.

The most difficult problem to overcome, I believe, is that the most generally held belief in the scientific community with respect to our problem is that the distinction between linguistic and conceptual facts is arbitrary and hence not a proper research question, but a matter of pragmatic decisions. It is this belief more than anything else that inhibits further progress of the kind Brachman found lacking."(p.257)

We regard our work as a contribution towards this final goal which we identify tout court with contextual reasoning, i.e. performing inferential processes on the basis of linguistic information while keeping under control the contribution of external knowledge in order to achieve understanding of a text.

2.The System GETA_RUN

GETA_RUN is a general multilingual text and reference understander which represents a linguistically based approach to text understanding and embodies a number of general strategies on how to implement linguistic principles in a running system. The system addresses two main issues: multilinguality, and the need to restrict access to

extralinguistic knowledge of the world by contextual reasoning, i.e. reasoning from linguistically available cues.

This idea implies that a text must be built in such a way as to enable the reader to understand it with the least conceptual effort. In particular, external knowledge sources should be tapped only in a parsimonious way and the interaction between linguistic processing and knowledge representation and processing should be activated by internal strictly linguistically motivated cues.

As to multilinguality, the user may switch from one language to another by simply unloading the current lexicon and loading the lexicon for the new language: at present only Italian and English are fully implemented. Work is under way for other Romance and Germanic languages, such as French and German.

2.1 Parser. The system is based on LFG theoretical framework and has a highly interconnected modular structure. Basic grammatical representation modules are the Lexicon, C-structure and F-structure which is internally represented as a graph. The Parser is a DCG which exploits the properties of Prolog as to its general parsing strategy - topdown, depth-first - and makes backtracking naturally available.

The basic tenet of the system is embodied in the wellknown fact that all languages share a common core grammar and may vary at the periphery: internal differences are predicted by principles. The DCG grammar allows the specification of linguistic rules in a highly declarative mode: it works topdown and by making a heavy use of linguistic knowledge may achieve an almost complete deterministic policy. Principles are scattered throughout the grammar so that they can be made operative as soon as a given rule is entered by the parser.

In particular, a rule may belong either to a set of languages, e.g. Romance or Germanic, or to a subset thereof, like English or Italian, thus becoming a peripheral rule. Rules are activated at startup and whenever a switch has been operated by the user, by means of logical flags appropriately inserted in the right hand side of the rule. No flags are required for rules belonging to the common core grammar.

Some such rules include the following ones: for languages like Italian and Spanish, a Subject NP may be an empty category, either a referential little pro or an expletive pronoun; Subject NPs may be freely inverted in postverbal position, i.e. preverbal NP is an empty category in these cases. For languages like Italian and French, PP or adverbial adjuncts may intervene between Verb and Object NP; adjectival modifiers may be taken to the right of their head Noun. For languages like English and German, tense and mood may be computed in CP internal position, when taking the auxiliary or the modal verb. English allows an empty Complementizer for finite complement and relative clauses, and negation requires do-support.

Syntactic and semantic information is accessed and used as soon as possible: in particular, both categorial and subcategorization information attached to predicates in the lexicon is extracted as soon as the main predicate is processed, be it adjective, noun or verb, and is used to subsequently restrict the number of possible structures to be built. Adjuncts are computed by semantic compatibility tests on the basis of selection restrictions of main predicates and adjuncts' heads.

Syntactic rules are built according to the latest chomskyian paradigm with CP-IP functional maximal projections; however, the general underlying theoretical framework is

cast into LFG theory. Thus, we build and process syntactic phenomena like wh- movement before building f-structure representations, where only anaphoric binding for pronominals takes place.

2.2 Quantifier Raising. Since we know that quantifiers and quantified NPs usually take scope at propositional level, we assume f-structure to be an adequate level of representation in which quantifers scope can be computed. We partially follow in this Halvorsen's proposals, which however require a further mapping from f-structures to σ-structures in order to do that. We proceed as follows: after assigning Q-Markers to quantifiers and quantified NPs and adding this information as attribute-value pair at f-structure, we peform Quantifier Raising by traversing f-structure until we reach a propositional node. At that level we deposit a Quantifer-Operator(Q-Op), in an attribute that has a list as its value. Once Q-Ops have been produced, we are in a position to assign quantifier scope. In case more than one Q-Op is present in the list, the algorithm simply reorders the operators according to their quantifying force, and or to grammatical function. Otherwise, a search downward is performed in the f-structure for other q-ops. When some q-marker is found another attribute-value pair is added at pred level indicating a quantified interpretation.

2.3 The Binding Module. The output of the grammatical modules is fed then onto the Binding Module(BM) which activates an algorithm for anaphoric binding in LFG terms using f-structures as domains and grammatical functions as entry points into the structure. Pronominals are internally decomposed into a feature matrix which is made visible to the Binding Algorithm(BA) and allows for the activation of different search strategies into f-structure domains. Antecedents for pronouns are ranked according to grammatical function, semantic role, inherent features and their position at f-structure. Special devices are required for empty pronouns contained in a subordinate clause which have an ambiguous context, i.e. there are two possible antecedents available in the main clause. Also split antecedents trigger special search strategies in order to evaluate the possible set of antecedents in the appropriate f-structural domain. Special care is paid to pronominals bound by quantifiers or quantified NPs.The output of the BA is then passed on to an Interpretation Module which operates locally in order to spot the presence of conditions for Specific or Arbitrary Reading for pronominal expressions.

Finally, this information is added into the original f-structure graph and then passed on the Discourse Module(DM).

2.4 Anaphora Resolution. Anaphoric binding of free pronominals takes as input Discourse level information which is computed by a Module of Discourse Anaphora(MDA) and decides on the basis of semantic categories attached to predicates and arguments of predicates whether to bind a pronoun to the locally available antecedent or to the discourse level one.

Discourse Anaphora is computed by a system which is very close to the ones available in literature on the same topic, and presented by C.Sidner and B.Webber in their publications. Definite descriptions are computed by means of locally available information and, but only when required, by tapping external knowledge sources. However, a set of

default rules are activated in lack of such knowledge which work simply on the basis of grammatical and semantic information.

This level of representation works on the basis of a list of candidates or possible arguments of discourse which includes all external pronouns and referential expressions. The algorithm creates a Weighted List of Candidates Arguments of Discourse(WLCAD).

The MDA detects Main, Secondary, Potential and Expected TOPIC for each sentence by weighting the list of external pronominals and of referential expressions made available by the grammatical representation. After the first sentence, the MDA tries to take advantage of discourse level internal cohesion and coherence mechanisms in order to check whether a given topic is reintroduced in the following text as a pronoun, a nominal substitute, a deictic and so on. The MDA is a finite state automaton that works strictly on the basis of two adjacent sentences; it has available a set of six states Continue, Change, Resume a previous topic; other states are Shifting, Retaining, Continue_Analyze. Special inferential mechanisms are activated at this local level by the presence of nonthematic functions, i.e. SUBJects or OBJects of copulative and other verbs which do not assign a semantic role to their arguments. The output of the MDA is a Rhetorical Structure with a list of all Topics in each utterance and a state.

2.5 Computing Information Structure. As a final level of representation the system builds Information Structure at clause level. Each utterance is decomposed into separate clauses to account for coordination and subordination. The output is a set of values associated to wellknown labels such as Clause Type, Point of View, Factivity, Change in State of the World, Relevance and Discourse Relations. Point of View may vary between Subjective, Subjective_Extensional, Subjective_Intensional, Objective; Change may be Null, Early, Culminated, Gradual and Setting; Relevance may be Foreground and Background. All these values are computed mainly on the basis of the semantic, aspectual and temporal features associated with the verbal predicate at f-structure.

Information structure is passed on to the Semantic Module and Discourse Relation Reasoning Module. In particular, the latter computes Discourse Relations on the basis of information structure, temporal interpretation and the model. The output of this module is a set of values, which include: Narration, Elaboration, Description, Parallel, Explanation, , Cause, Result.

GETaRUN is now able to activate a Supervisor which computes Relevance associated to each individual or set asserted in the DKBF by adding scores derived from the Information Structure and the Rhetorical Structure.

2.6 Semantic and Temporal Interpretation. Semantic interpretation is carried out in two phases: a static phase which takes as input the description realised by LF, turns it into a list of lists which contain relations, their arguments and their modifiers and adjuncts. In particular, a given predicate will be represented as a relation in the sense that it will constitute a fact or a situation, according to semantic conditions, and its arguments will consequently be assigned a similar representation. However, the dynamic interpreter alone will make available world identifiers for entities referred to by arguments of a given predicate and will link intensional objects to extensional entities existing in the world.

Spatial and Temporal Location of States and Events is also computed in order to provide the basic location indices on which reasoning in the following module will operate.

The result of the DM is thus fed on to the Dynamic Interpreter for the creation of a Dynamical Knowledge Base of Facts and Situations(DKBFS). Entities are represented as Classes, Individuals and Sets which are asserted into the DKBFS together with their cardinality and restrictions where present. Each fact or situation is numbered as infon and space and time anchoring locations are associated to it.

The Dynamic Interpreter is responsible for long distance textual coreferential mechanisms: local topics are checked for coreferentiality with previously asserted individuals or sets existing in the model world. They may be regarded to be so in case their cardinality and/or their restrictions coincide. Other possible results of the SM interpretation procedure are set inclusion: a set or individual is regarded to be included into a previously asserted set in case its cardinality and/or its restrictions and/or inherent semantic features allow it. Also, there can be cases of situations supporting facts in the sense of a given set being introduced in the world as an intensional object, supporting the existence of an extensional individual interpreted as a fact.

The SM is able to assign cardinality to plural NPs on the basis of the restriction defined by their possessor, in case it is a pronoun bound at sentence or text level. Recency of referential procedures accounts for preferred antecedent assignment in case of semantic compatibility to the closest individual/set available.

The main or central interpretive assumption purported by the system is then constituted by the ability to control inferential search to external knowledge of the world: this is done only in case a singular definite NP is introduced in discourse as the higher referential expression candidate for topichoood, whenever no matching takes place with the previous topics.

2.7 The World or Discourse Model. Reasoning is carried out in the Discourse Model into several separate modules: Discourse Relations, Temporal Reasoning and Situation Semantics Representations. Discourse Relations are built for each proposition by means of semantic information associated to main predicates and by the output of the Temporal Reasoner. The latter, is a module embodying J.Allen's ideas and Reichenbach's tripartite structure of temporal representation. According to the input received, the system may assign an interpretation in terms of discourse relations by means of a mechanism of Temporal Anaphora and Focus which takes into account information related to semantic roles associated with arguments of the predicates and matches them at first with the ones available in the previous proposition: a temporal anaphora or a new temporal focus is thus the outcome both of semantic and temporal reasoning.

These information are eventually passed on the Semantic Module where a representation in terms of situation semantics is computed: each proposition is translated by the logical form algorithm into a **fact** or a **situation** according to semantic conditions, and is completed by a polarity, a spatio temporal location constituted by constants inherited from the previous modules. The final ontology is made up by locations, individual entities which may also be treated as classes and set with a given cardinality, facts and situations about entities which may be attributes or roles according to their semantics, basically constituted by the grammatical function and semantic role associated to the argument or adjunct by the previous parse.

The Knowledge Base thus coincides with the dynamically built Discourse Model where extensionality and intensionality is computed according to the actual value of the

main predicated in a given context. The External World Knowledge Base is tapped only when needed, and in particular whenever a singular definite NP is introduced with a special topicality in the discourse and no antecedent is be available in the Model.

The Discourse Model is consequently a database in which inheritance is easily computed at the end of the story. In addition, we created a mechanism of Relevance Score assignment which takes into account topicality and discourse relations in which a given entity was involved by computing a score with different weights. In this way, all entities appearing in the story are finally sorted in descending order according to their relevance, with the list of facts and situations each one shared.

Besides c-structure and f-structure, we use logical form to compute quantifier scope and build logical representations which are eventually passed on the Discourse Model, where semantic interpretation is carried out.

Temporal aspectual interpretation is carried out on the output of f-structure representation and computes a complete interval logic coindexation of events and states at clause level on the basis of Reichenbach's tripartite model for temporal calculus. This is then passed on to the semantic module to serve for the understanding of Temporal Relations, which are cast on the basis of J.Allen's system for temporal logic notation.

3. How the System works

In processing a narrative text, a listener is developing a model of at least two things: 1. the entities under discussion, along with their properties and relationships to one another, and 2. the events and situations under discussion, along with their relationships to one another (e.g. consequential relations, simple ordering relations, elaboration relations, etc.): This representation can be called the Discourse Model.

NPs may evoke entities into the listener's DM corresponding to individuals, classes, sets, subsets of previously asserted sets or classes, relations, roles etc. An NP which evokes a discourse entity also specifies it, where "specify" means refer in a model, as opposed to refer in the outside world (Sidner 1983). Evoking an entity may cause its description in the model in case no such entity already exists; or it may cause the description of some additional property not already present in the DM associated to that entity. In case none of these two possibilities obtain, we say that the evoked entity cospecifies a previously asserted entity. Two possibilities remain: the entity has been defined a Topic by the Discourse Component and the identifier associated to the entity will be assigned to that Topic. Valid Topics are Expected, Main, Secondary and the first Potential Topic on the stack. This applies to all singular definite NPs. As for indefinite NPs the stack of Potential Topics can be scanned and whenever an indefinite singular NPs is found it is asserted as a fact or sit according to semantic conditions. Definite NPs, be they plural or singular, placed lower in the stack of Potential Topics, will not be described in the model as sets, they only appear as facts related to classes. Discourse relevance is taken as a determining factor in splitting up relevant entities from irrelevant ones. In other words, a definite NP be it singular or plural, is filtered by the Discourse Module in order to be regarded as a relevant possible entity.

The process of anaphora resolution in our system is split up in two separate procedures: the one takes into account pronominal reference and the other nominal

reference by means of definite NPs. In fact, the first procedure is only activated whenever pronouns left free by the module of anaphoric binding at sentence level are spotted by the algorithm. The second procedure on the other hand is always activated and is responsible also of the setting up of the current discourse state.

3.1 States and Domains

3.1.1 Coherence as a Finite State Machine. In their paper on the Centering Approach Brennan et al.(1987) present a formalization to modeling attentional structure in discourse as a means for capturing coherence at text level. Their approach embodies a set of rules and constraints that should reflect the relationships existing between what the discourse is about and linguistic choices made by discourse participants as to their local relevance in a given discourse segment. They also establish a typology of transitions from one utterance to the next which should describe the way in which utterances are linked together in a coherent local segment of discourse. As the authors note, if a speaker has a number of propositions to express, one very simple way to do this coherently is to express all the propositions about a given entity before introducing a related entity and then perhaps shifting the center to this new entity.

Even though their paper is an excellent presentation of the problem at hand, and the algorithm seems perfectly wrought out, we assume - as the authors themselvels admit - that it is only in a preliminary stage in the coverage of real texts. Also, it is clearly a non efficient tool, since the work the algorithm does every time a Center must be established is redundant. There seems to be a lack of confidence in the possibility that real texts should actually behave the way their approach suggests.

The algorithm is thus deficitary in two ways: it is too strict and too limited in scope. This might depend on the fact that the authors did not try it on an extended number of texts, perhaps because they believed that the same approach could be simply adopted as it stands to cover other more complex cases.

Our approach to the general problem of reference resolution is guided by the following economy principle:

> "Try a matching on the basis of grammatically encoded information; then explore the Model and/or the Discourse Domain in search of a suitable entity, and try an inference"

The Finite State Machine we use at intersentential level, is not so strict as the one proposed by Brennan et al. In particular, we also build up a Weighted List of Topics (WLT) which however does rely on Grammatical Functions, Semantic Roles and Selectional Restrictions information associated with each referring expression of the current utterance. The first Ref_ex in the rank list is always assigned a preferential status, however we also keep an eye to the second ranked Ref_ex. The rest of the stack might also be used to search for the presence of some Ref_ex which corefers with one of the previous Topics: this is done in order to ascertain whether some cohesion is present.

The representation we assign to each state of discourse is then more articulated: we use four specific Topic labels, Expected, Main, Secondary, Potential. The latter is in fact a

stack, and the previous ones are individual slots. Whenever a Ref_ex becomes Main Topic it usually reappears as Secondary Topic in the following text even though it is not included in the list of Ref_ex for that utterance. This is done to establish the persistence of a Main Topic in the discourse and for possible recovery by grammatical rather than inferential means. Matching procedures are much quicker and much easier than inferential processes on the Model Knowledge Base.

In case a pronoun has been used to corefer, a description of the head it has been bound to should be present in the Model. In case a nominal head has been used, this might or might not be present in the Model.

As we said, f-structures are augmented by the output of the algorithm for anaphoric control, i.e. attribute-value pairs indicating the relation intervening between an antecedent and a pronominal expression which has been bound at sentence level, by means of indices.

When an f-structure is passed to discourse modules, the head of the antecedent as well as the head of a functional and a syntactic controller are substituted into the head of the controlled element.In addition, since we want only referentially free elements to appear at discourse level, controlled or bound elements are discarded.

The discourse module builds up a list of these elements which will eventually contain nominal heads and free pronominals: each of these elements is characterized by a vector of functional and semantic information which is used by the discourse module to weight them, and assign them to a rank list.

The output is the weighted list of topics, where referential elements are ranked according to their relevance in the current sentence. In the first sentence of a text the current Expected and Potential Topics are chosen from referring expressions available according to rank.

In the following text, the Main and Secondary Topics are asserted, usually by reinforcing the Expected or the Potential Topic. From now on, however, the Model of discourse is available as well as the Domain of Consciousness: these may be accessed to guide the choice of the Main Topic from the currently available Weighted List of Topics or from the Model or else by picking the Subject of Consciousness.

Another important criterion for the setting up of a Main Topic is the state assigned to the previous segment of discourse: we use the following ones,

CHANGE, CONTINUE, RESUME, RETAINING, SHIFTING, CONTINUE_ANALYSE

Whereas a Change state indicates that a new entity is being referred to by some nominal or pronominal expression and is the current Expected Topic, a Continue state indicates that the same entity has been asserted as Main Topic. The remaining states are Resume, Retaining, Shifting and Continue_Analyse. Shifting is used whenever there is a grammatically marked focalized constituent: in other words, a presentational construction has been used in the text, either by Locative Inversion or a There-sentence or any other available means offered by the specific language. This causes the focalized constituent to be set as Main Topic. As to Continue_Analyse, we use it to indicate the fact that a previously described entity which was a set, is now being reintroduced as a subset.

Resume is a state that is invoked any time the first referring expression on the Weighted List of Topics is not available in the adjacent portion of text and must be

recovered from the Model. The entity is set as Expected Topic. Finally, a Retaining state indicates that the current utterance is promoting one of the Topics present in the adjacent portion of text as possible new topic of discourse: in this case, the first referring expression on the WLT does not coincide with the previous Main Topic. It will be set as Expected Topic.

3.1.2 Pronominal Anaphora. Pronominal binding at discourse level may by achieved in three different ways: either by simply matching functional features between the pronoun/s and the possible antecedents available in the adjacent discourse segment. Let's dub this first mode as grammatical binding at discourse level. In this case, the system activates a strategy for choosing the most adequate antecedent which is based on a number of cues automatically set up by the general algorithm. Discourse states provide a first cue: in case a Continue is present, a Main Topic should be available; in case a Change is present in the previous stretch of discourse, an Expected Topic is available and so on. In case there is only one pronoun, a first match is tried with the adjacent most relevant possible antecedents. However functional features may direct the choice to other previously asserted Topics, like Secondary or Potential Topic. When two pronouns are present, the Weighted List of current referring expressions is used as the main cue for finding possible antecedents. Actually all other cues, i.e. discourse state and previous Topics relevance should conspire in directing the algorithm to the best choice. And this is what happens in our texts.

However, grammatical binding is not always possible, either because of some inconsistency due to inferential processes or because of domain restrictions. The second mode is then the one related to the presence of a pronoun and a definite NP which could modify the expectations built up by the general algorithm. In particular, in case there are two important characters, it is important to keep under control definite NPs in order to infer some general property related to one of the character and then leave the pronoun for the usual matching devices with the other character. In case no such inference takes place, inconsistencies may arise because it might be the case that the actual Main Topic is not the adequate antecedent for pronominal reference. This information can only be captured once a definite NP is checked by inferential means to be a property belonging to the Main Topic. In this case, binding the pronoun and coreferring the definite NP to the same entity would result in a clash, which might be dubbed as a case of Obviation or of Disjoint Reference.

Finally the last mode takes advantage of Discourse Domain: this notion is related to the need of segmenting the text into Objective and Subjective Domains. This subdivision is taken advantage of whenever a Subjective Domain is established and some character is assigned as Subject of Consciousness. This usually happens whenever the character is already asserted as the Main Topic of a given discourse segment. In case a SC is present, the weighted list of referring expressions for the current sentence is only used to introduce Expected or Potential Topics: the Main Topic on the contrary is always fixed to the current SC. This is also applicable to cases of "atmosphere statements" in which no new entity is being introduced, but there is the need to maintain the SC as Main Topic, so that it would be available to any pronoun or definite NP intervening in the subsequent stretches of text (see Text 4. below).

3.1.3 Nominal Anaphora. Before entering this module, the algorithm substitutes the head of the pronoun with the head of its antecedent. In this way, all free pronouns are eliminated from the current list of referring expressions. In fact there are cases in which some entity is introduced in the discourse as an indefinite pronoun and no antecedent may be found in the adjacent stretch of discourse. These cases are dealt with in the Model, by asserting the indefinite entity as an entity belonging to the class defined by semantic selectional restrictions associated to that NP by the verb.

In all other cases, we always deal with nominal heads of some kind, be they proper or common names. The module has two main tasks: one of coupling the first or the second ref_exs in the weighted rank list with any of the previously asserted Topics; the other of asserting the new state of discourse.

The state of discourse guides the selection of matching procedures between current referring expressions and previous Topics. In case the coupling or matching does not succeed because there is no relation between the adjacent discourse segment and the current sentence, the state of discourse should be a shifting. Or else the Discourse Domain should provide a Subject of Consciousness to introduce as Main Topic to mark the fact that the current sentence is a subjective sentence. In this case the first referring expression in the list will be asserted as Expected Topic, in case the following text might be shifting to this newly introduced entity.

Special procedures are always invoked every time the current sentence carries functional information which evaluates one argument as focalized: this always causes a Shifting to occur and a double operation to be computed. First, the focalized argument is asserted as Main Topic, second the previous Main Topic is asserted as Secondary Topic to mark its possible persistence in the text.

This module accesses the World Model of the previous text whenever needed. In particular there are two possible situation in which this is compulsory: whenever the current ref_ex is a proper name which however corefers with a property already associated to that name in the previous text. In this case the algorithm should compute this as a Continue and a reassertion of the same Main Topic.

A subcase is represented by the situation in which an entity is simply reintroduced with its proper name but it was not present in the adjacent portion of text. The entity is simply recovered from the model and asserted as Main Topic. Another subcase is constituted by the case when the current ref_ex is a proper name but the previous Main or Expected Topic was a plural common noun, a property already associated with the current name.

3.1.4 Some Examples. Consider briefly Text 1.: when utterance 3 is processed, a subject of consciousness is established with the pronoun "she", which is resolved in the Model as coreferring to Mary. Utterance 4. has a plural pronoun and no antecedent available in the adjacent text segment. The Model is invoked in order to search for two fully specified individuals, John and Mary, which are assigned as antecedent of "them": this in turn binds "you" in the following complement clause. Utterance 5 is a case of Implicit Subjective Domain whose content is ascribable to the Subject of Consciousness(S-C), and is evaluation of a previous assertion: "it" is bound to a previous relation. Also Utterance 6. is a case of Implicit Subjective Domain where the LDBR is bound to the S-C. Also consider the binding of "his" in utterance 7. which has no local antecedent, but is computed

on the basis of "recency" criteria: Steve is the most recent proper name, or fully specified individual available as a singular entity.

Now consider Text 2. where a S-C is established in utterance 2, and is a proper name, "John". In the following utterance, the system computes an Implicit Subjective Domain, a nonfactive assertion, a Continue with John as Main Topic, and the same S-C. In this way, when utterance 4. is reached, the pronoun "he" is bound to John rather than to Richard. Utterance 5. is again an Implicit-Subjective Domain so that when the following utterance is processed, the LDBR "himself" is adequately bound to John.

Text 1.
1. John gave Mary a rose.
2. She took it and put it in her hair.
3. She knew that she had been given a present, something precious.
4. When Steve faced them saying : "Are, you, enjoying, yourselves ?"
5. It was horrible ! It was shocking !
6. Not for herself.
7. She felt only hostility and his determination to ruin that wonderful moment.
8. John smiled and went away embarassed.

Text 2.
1. The three friends went all outside.
2. As they were walking in the garden, John said to himself "Sara will marry that man", without any resentment.
3. Richard would marry her.
4. He felt strongly all this.
5. She was the right person for a man like Richard.
6. As for himself, he was absurd.
7. His demands upon Sara were absurd.
8. She would have accepted him still if he had been less absurd.
9. Richard began to sing.

Text 3.
1. Mary picked up the phone and called Jason.
2. Her husband, she thought, would have considered such a move as untruthful and utterly base.
3. Perhaps there was something in herself that could not help but do the wrong thing at the wrong time.
4. Jason answered immediately.

Text 4.
1. John went into a restaurant.
2. There was a table in the corner.
3. The waiter took the order.

4. The air was nice and clean.
5. He took the cup and drank his coffee.

3.2 Subjective/Objective Domains and the Subject of Consciousness. J.Wiebe and W.Rapaport in their paper(1988) present a computational theory for recognizing discourse passages which are told from the perspective of a character. In what follows, the two authors go on defining what they mean by perspective in narrative simply by using Ann Banfield's (1982) - which we also assume to be a landmark for literary text analysis - categorization of the sentences of narration into subjective and objective sentences. And finally they assume that "our task of recognizing the current perspective is, therefore, to recognize subjective sentences and the subjective characters to whom they are attributed"(131).

However, we take Banfield's categorization of sentences and the task of establishing the current perspective as a non sequitur. This is very much so if we consider the further fact that W & R make the claim that whenever a subjective context is independently established by Banfield's categorization, we are dealing with the character's beliefs, seen that what is being told in the narrative reflects his perspective.

Let's consider more closely Banfield's categorization: a subjective context is established by subjective sentences which may either portray the character's thoughts (represented thought) or present a scene as a character perceives it (represented perception). In particular, such verbs as "hear, see, realize, know, think, wonder, remember, want" are regarded as markers of subjectivity.

In our system, these verbs are classified into separate categories:

a. Mental activity verbs
   think, wonder
b. Stative, Presuppositional and Factive verbs
   see, hear, remember, realise, know
c. Intensional verbs
   want, desire, wish, expect
d. Subjective
   consider, believe

It is our opinion that only a. c. and d. verbs may attribute a sentence to a subjective domain; on the contrary, stative and factive verbs only depict objective facts: as a consequence, the object of any such verbs is always regarded as a state or a fact in the world, and should be so understood by the reader, contrary to what the two authors assume.

Another important fact is the lack of consideration for structural contribution to the categorization of sentences in a subjective or objective domain. If we take a verb like "say" or "tell" they are classified as Reportive verbs: however, in case the addressee is a reflexive pronoun as in one of our examples, the context is pre-subjective. "John said to himself that..." is understood as the indication that something objective is happening, the saying relation, which however preludes to a subjective context. In other words, in this situation,

the system sets up an initial boundary for subjective domain, as discussed in some detail here below.

3.2.1 Long-Distance-Bound Reflexive Pronouns. Anne Zribi-Hertz was the first generative linguist to assume that the binding of Long-Distance-Bound (LDB) Reflexive Pronouns in English, that is, those pronouns that search for their antecedents outside the sentence domain, must be viewed from the level of Discourse Grammar. She introduces concepts such as Subject-of-Consciousness and Domain-of-Point-of-View to demonstrate that it is necessary to rely on semantic discourse concepts in order to explain the behaviour of LDB anaphoric expressions.

This means that c-comand does not rule over such occurrences of pronominal expressions and works only at sentence level.

Her analysis represents a step forward to the understanding and conceptualizing of discourse grammar and, at the same time, this kind of approach confirms that an exclusively syntactical sentence-internal approach is insufficient and inefficient.

Sells(1989) reaches almost the same conclusion as Zribi-Hertz but inside a different theory: he introduces concepts such as SELF, PIVOT, SOURCE, that is, few discourse roles which affect the distribution of LDB pronouns.

He further shows that LDB pronouns should be read as logophoric: their antecedent is always an entity whose thoughts and feelings are represented in the clause of the pronoun.

3.2.2 Subject-of-Consciousness and Domain-of-Point-of-View. Subject-of-Consciousness is a semantic property assigned to a referent whose thoughts and feelings are represented by a portion of discourse.

Authors like Virginia Woolf and James Joyce are masters in the use of this subjective fiction, where subjective means that facts are depicted as filtered by a conscience, that of the **Subject-of-Consciousness**, contrary to the objective narrative where no consciousness intervenes.

The Subject-of-Consciousness is a concept already pertaining to literature that has to be formalized because it is a factor that plays a fundamental role in discourse and in particular it helps in resolving the mechanism or binding of LDB anaphoric expressions: the Subject-of-Consciousness results as the antecedent of such LDB anaphoric expressions. As a result, to be able to identify it, is paramount for the interpretation of anaphoric processes.

Before giving our formal definition of SC, we need to define the concept of **Domain-of-Point-of-View** (DPV), since these two are interrelated and interdependent concepts.

A DPV may be formally defined as a portion of discourse which is the grammatical expression of one and only one narrative point-of-view; the point-of-view being the perspective used by the author to describe the facts, real or hypothetical, in a text: it may be the author himself, the main character, other characters, or there may be no point-of-view at all.

We have identified at least four different kinds of Domain-of-Point-of-View not just two as it was suggested by Zribi-Hertz's analysis; each has its own particular structure, its features and functions.

We also built some tests that help identifying the different kinds of DPVs.

3.2.3 Objective Domain-of-Point-of-View. The Objective DPV (OD) is taken to be the default domain, that is, the domain in which reality is what a written text focusses on. In an objective DPV, reality is depicted as not being expression of any point-of-view, or rather, an objective DPV does not fall under the scope of any Subject-of-Consciousness.

In English, in an objective DPV usually the aspectual (or semantic) category of the verb in the main clause is a process, that is, in an OD the Temporal Focus moves.

We even noted that normally (not always) whenever we pass from a Subjective DPV to an Objective one, the old SC is re-established through the use of a proper name.

3.2.4 Pre-subjective Domain-of-Point-of-View. A Pre-Subjective DPV (PSD) is still an Objective DPV in the sense that there is still no SC, but the presence of a particular formal mark acts like a door which introduces necessarily as its object an Explicit Subjective Domain.

The formal mark that characterizes a a Pre-Subjective DPV is represented by the category of the verb: in a PSD the verb may be a psych verb, a verb of mental activity, or an emotional verb.

In a Pre-Subjective Domain the Subject-of-Consciousness of the depending Explicit Subjective Domain is instantiated through the use of a pronominal expression (i.e. it is the thinker, perceiver, or senser present in the PSD) and it is identified through few semantic roles as well as on basis of syntactic information:

```
pre_subjective_cat(subjective, [experiencer, actor, theme_nonaff]).
pre_subjective_cat(presuppositional, [actor]).
pre_subjective_cat(emotional, [experiencer, actor, theme_emot]).
pre_subjective_cat(reportive, [actor]).
```

Let us look at one example to clarify this point:
Ex 1 **[psd** Mary felt that] **[esd** she was unable to say "no".]

Here, the main clause is a PSD due to the presence of 'felt' which is an emotional verb; therefore, it necessarily introduces an Explicit Subjective Domain whose characteristicswill be discussed below.

Note that in the PSD the SC is established ("Mary"), that is the "Senser", and that in the ESD it is present in the form of a personal pronoun.

The following sentence is part of a wider discourse that we have analyzed. The output of the computational analysis is shown:

Ex 2: She knew that she had been given a present, something precious.

```
RHETORICAL STRUCTURE:
stato(3, retaining)
topic(3, main, id2)
topic(3, secondary, id11)
```

CLAUSE IDENTIFIER: 3-n1
CLAUSE TYPE: main/prop
FACTUALITY: factive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: description
DISCOURSE DOMAIN: pre_subjective(3-n1, sn3, she)
SUBJECT OF CONSCIOUSNESS:none

CLAUSE IDENTIFIER: 3-n18
CLAUSE TYPE: fcomp/prop
FACTUALITY: factive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: narration
DISCOURSE DOMAIN: explicit_subjective
SUBJECT OF CONSCIOUSNESS: she/sn3 from 3-n1

3.2.5 Explicit Subjective Domain-of-Point-of-View. The preceding example shows what happens as a rule: there is a strict correlation between the Pre-Subjective DPV and the Explicit Subjective DPV (ESD), that is, the ESD always follows a pre-subjective DPV and the SC of the ESD is always instantiated in the PSD.

Direct speech is always treated as an objective domain, rather than as an Explicit Subjective DPV: when we are in presence of a direct report it is evaluated objectively by the reader not as something reported by the SC but as something viewed from an external position.

3.2.6 Implicit Subjective Domain-of-Point-of-View. The Implicit Subjective DPV (ISD) is more complex, but more interesting for our purposes: it expresses the thoughts and feelings of the current SC which is not syntactically present and remains implicit. The important fact is that all the pronouns (especially LDB reflexive pronouns) found in a ISD all refer back to the current SC.

First, we have realized that the Subject-of-Consciousness of an ISD is always the SC of the last preceding ESD. Thus, we always require the preceding DPV to be an Explicit Subjective one.

Furthermore, in order to individuate ISDs we have formulated some tests that allow us to single out this kind of DPVs, that is, we have found some formal marks which are sufficient conditions for Implicit Subjectivity.

If a verb is a state or indicates existence, this confirms Subjectivity. Secondly, we have seen that exclamations, questions in indirect report and the presence of modals (i.e., would, could, should, must, may) or intensional verbs are all manifestations of the current Subject-of-Consciousness and then always indicate Implicit Subjective DPVs.

As also reported in W & R's paper, few adverbs seem to be 'subjective' , as they express the will of a character and his personal judgement: for instance, 'of course', 'perhaps', 'literally', 'obviously' and many others.

In conclusion, we have individuated four different DPVs which establish the SCs, but there may be other factors at work, semantic or syntactic, which will allow us to deepen our knowledge of discourse segmentations into Domains-of-Point-of-View.

3.2.7 Domain Boundaries. Recognizing the structure and characteristics of each Domain-of-Point-of-View is paramount for individuating the **Domain Boundaries**: since a piece of literature is a sequence alternating Subjective and Objective DPVs, we have to establish where they begin and where they end.

For our purposes, what is relevant is the capability to detect the **Subjective Boundaries**: we have assumed that a Subjective Boundary possesses a formal subjective mark such as the presence of an Explicit Subjective DPV, and may potentially open an Implicit Subjective DPV without formal marks. In this last case, the presence of a modal, or exclamative sentence acts as a Subjective Boundary.

In sum, we have established that Implicit-Subjective , Explicit-Subjective and Pre-Subjective+ Explicit-Subjective DPVs may be Subjective Boundaries as easily seen below:

```
disc_domain(_, _, _, CatSem, _, _, PrecDom, implicit_subjective,
  SubjConsc)
  :-
  stative_cat(CatSem),
  subjective_boundary(PrecDom),
  subject_of_consciousness(SubjConsc).

subjective_boundary(implicit_subjective).
subjective_boundary(explicit_subjective).
subjective_boundary(pre_subjective(_, _, _)+explicit_subjective).
```

3.2.8 An example. The following example is a brief discourse where the LDB reflexive pronoun "herself", being in an Implicit Subjective DPV, is computed as coreferent with the Subject-of-Consciousness previously established with the procedure we have described in this paper.

(D1)

[mary, picked, up, the, phone, and, called, jason]

```
CLAUSE IDENTIFIER:          1-n4
CLAUSE TYPE:                coord/prop
FACTUALITY:          factive
CHANGE IN THE WORLD:        null
RELEVANCE:                  background
DISCOURSE RELATION:         narration
DISCOURSE DOMAIN:           objective
SUBJECT OF CONSCIOUSNESS:none
```

CLAUSE IDENTIFIER: 1-n32
CLAUSE TYPE: coord/prop
FACTUALITY: factive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: narration
DISCOURSE DOMAIN: objective
SUBJECT OF CONSCIOUSNESS:none

This first sentence consists of two coordinate clauses; the DPV is objective, there being no subjective markers, this is further confirmed by the presence of two non-stative verbs.

(D2)
[her, husband, ',', she, thought, ',', would, have, considered, such, a, move, as, untruthful, and, utterly, base]

CLAUSE IDENTIFIER: 2-n2
CLAUSE TYPE: report/prop
FACTUALITY: factive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: description
DISCOURSE DOMAIN: pre_subjective(2-n2, sn23, she)
SUBJECT OF CONSCIOUSNESS:none

CLAUSE IDENTIFIER: 2-n19
CLAUSE TYPE: fcomp/prop
POINT OF VIEW: subjective_intensional
FACTUALITY: nonfactive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: background
DISCOURSE DOMAIN: explicit_subjective
SUBJECT OF CONSCIOUSNESS:**she**/sn23 from 2-n2

This construction is an indirect report where the main clause is a Pre-Subjective DPV due to the presence of a mental activity verb: the reportive clause is an Explicit Subjective DPV whose SC is 'she', that is, the 'senser/thinker' of the verb in the main clause. The ESD is a Subjective Boundary.

(D3)
[perhaps, there, was, something, in, **herself**, that, could, not, help, but, do, the, wrong, thing, at, the, wrong, time]

CLAUSE IDENTIFIER: 3-n1

CLAUSE TYPE: main/prop
FACTUALITY: factive
CHANGE IN THE WORLD: null
RELEVANCE: background
DISCOURSE RELATION: description
DISCOURSE DOMAIN: implicit_subjective
SUBJECT OF CONSCIOUSNESS:**she**/sn23 from 2-n2

Being the preceeding DPV a Subjective Boundary, the presence of a stative verb in this *there-* sentence confirms that this is an Implicit Subjective DPV. Other indicators of subjectivity are the possibility adverb "perhaps", the presence of a predicative complement which is an "assertive indefinite pronoun" leaving the reference unspecified. The reflexive pronoun "herself" is successfully bound to the Subject-of-Consciousness established in the last ESD.

4. Definite and Indefinite NPs. Anaphors is a general term for a range of expressions that are context-dependent in that they either specify entities in an evolving model of the discourse that the listener is constructing, or they depend on other entities in the discourse model. They are called Discourse Anaphors in Webber's paper on Tense (1988).

The dependency of a DA on a discourse entity may result from the ontology of the specified entity, as well as from discourse structure and its focusing effect.

It has been argued extensively in the literature that definite NPs are exclusively used to corefer or cospecify entities already in the DM, whereas indefinite NPs can be used to introduce new entities in the world. However, we shall stress the need to ensure that both definite and indefinite NPs can be used to corefer or cospecify entities and relations in the DM. Besides, we also should note that both kinds of NPs can be used to introduce new entities in the world.

4.1 Indefinite NPs. Consider first indefinite NPs: they may cospecify some previously asserted relation or they may introduce some generic property which is already inferable from the model:

1. Mary picked up the phone and called Jason.
2. Her husband would have considered such a move as base.

The NP "a move" is an event noun cospecifying the calling event, a relation previously asserted in the DM.

3. They appointed John managing director.
4. This was a position he had been longing for for ages.

The NP "a position" is an activity noun cospecifying the role property "managing director" asserted in the previous discourse segment and associated to John.

5. Richard would marry Sara.

6. He felt strongly all this.
7. She was the right person for a man like Richard.

The NP "a man" is a generic noun which corefers with Richard.

8. Once upon a time there were three little pigs.
9. They decided to build a little house each.

The NP "a little house" is asserted as a sit and not a fact and a cardinality is assigned to this set due to its being in the scope of the distributive quantifier "each". In turn, the floating quantifier is computed as an open adjunct controlled by the subject "They" which corefers with the antecedent NP "three little pigs" in the previous segment of discourse. In another version of the same story, the little house become a straw hut and then a little house again, as shown in the following excerpt:

10. As they reached a nice wood, they decided to build each a comfortable little house.
11. Timmy didn't like working at all, so he thought to build quickly a straw hut.
12. Soon the little house was ready

The NP "a straw hut" is understood to be one of the little houses already introduced in the previous discourse segments. However, knowledge of the world is called for in order to make the appropriate inference. Also notice that the following sentence uses a definite NP to corefer with the previous indefinite NP, and here again the same problem arises: the hut becomes a little house. For sure, we want the DM to be consistent and to understand that there is only one little house under discussion, which however is a kind of house, a hut.

Finally the most interesting case: an indefinite NP which is understood as a generic property of an entity introduced in the model by the same relation.

13. John gave Mary a rose.
14. She took it and put it in her hair.
15. She knew she had been given a present, something precious.

The NP "a present" cospecify the NP "a rose" which has been previously introduced in the model by a giving relation. The dependency is contextually determined by the presence of an entity Mary which is assigned the same semantic role in both sentences: she is always the Patient argument of the predicate GIVE. The system can also recover the Agent argument which has been omitted and is represented in f-structure as a lexically-bound existential quantifier "exist". At the end of the computations, we know that "a rose" is also "a present" which has been given to Mary by John. In order for the inferential mechanism to draw the relevant inference, tense is used: the past perfect can be regarded as a presuppositional tense, i.e. a tense that indicates that some fact or event took place in the previous portion of text. This can be assumed also by the presence of a presuppositional verb "know" that governs the sentential complement clause in which the giving relation is used.

4.2 Definite NPs and Pronouns. We shall start by quoting an example from Webber(1988, her 2.)

a. Wendy gave each boy a T-shirt.
b. They had a beautiful logo on the front.

Here we see that the plural pronoun is used to corefer with an indefinite NP which is singular, but is computed as being in the scope of a distributive quantifier, "each" which binds the cardinality of the indefinite to that of the noun "boy", thus turning a singular to a plural NP, a set and not an individual.

Another interesting case is represented by her example 4. where a plural pronoun is made to corefer to a class related to a singular NP in the previous discourse by inferential processes,

c. The dachshund down the block bit me yesterday.
d. They are really vicious beasts.

The pronoun is computed as the controller of the property "beasts" which is in the open complement of the verb "be"; this in turn should be taken as a generic property associated to the definite NP "the dachshund" which the sentence evokes. Clearly this case requires the presence of an ISA Relation in the ontology of the entities, constituting the extra-linguistic knowledge required to understand the relations intervening in the text at hand.

We now comment her example 5. where a definite NP is introduced as a new entity associated to an existing discourse entity:

e. A bus came round the corner.
f. I signalled to the driver to stop.

The definite NP "the driver" is here understood as an entity associated with the "bus" mentioned in the previous sentence. In our system this can be achieved by an inference on the main location of the text. The driver is related to the bus, since the scenario was set before by mentioning the location in which the driver could be inferred as being a part of, or better a role linked to that frame. Better examples of this problem are constituted by the texts provided in the paper by Garrod and Sanford(1988), where the scenario effect is more marked:

16. John went into a restaurant.
17. There was a table in the corner.
18. The waiter took the order.
19. The atmosphere was warm and pleasant.

The scenario is set in the beginning of the text, either by a title "At the restaurant", or by explicitly mentioning the restaurant as an Oblique argument of a going relation where the main Topic is also introduced. When we get the definite NP "the waiter", an inclusion

relation inference has already being fired by the location "the corner" which is understood as being a part of the main location, the restaurant. Thus, "the waiter" can now be computed as being in an inclusion relation with "the restaurant", being a role pertaining to that scenario or frame. Another important side effect of the analysis is that the Main Topic, John, is not discarded in favour of the new entity "the waiter", but persists in the Discourse Module. Thus, in case the text continues with what the authors call "psychological atmosphere statements", we may impute the subjective judgment on the Main Topic, John, rather than on a possible Expected Topic, the waiter.

More complex examples can be derived from our texts, in which more than one character is introduced in the text. In particular, the story of the three little pigs has the most intricate plot we found, since we are given at the same time six possible entities to be used for further processing. This is the beginning for an abridged version:

Segment A.

Once upon a time there were three little pigs who lived happily in the countryside. But in the same place lived a wicked wolf who fed precisely on plump and tender pigs. The little pigs therefore decided to build a small house each, to protect themselves from the wolf. The oldest one, Jimmy who was wise, worked hard and built his house with solid bricks and cement. The other two, Timmy and Tommy, who were lazy settled the matter hastily and built their houses with straw and pieces of wood. The lazy pigs spent their days playing and singing a song that said, "Who is afraid of the big bad wolf?"

And these are the entities already present at this point of the computation:

i. a set of three little pigs

ii. a set of three little houses

iii. an individual, member of the set of little pigs, whose name is Jimmy

iv. a subset made of two little pigs, always members of the set of three little pigs, whose names are Timmy and Tommy

v. a single little house, member of the set of three little houses, made of bricks and cement, owned by Jimmy

vi. a subset of two little houses, included in the set of little houses, made of straw and little pieces of wood, owned by the subset of two little pigs, named Timmy and Tommy

As the text proceeds, coreference is activated by evoking one of the entities either by a property, the fact of being brothers or being pigs, or by explicitly indicating cardinality.

Segment B.

And one day, lo and behold, the wolf appeared suddenly behind their backs. "Help! Help!", shouted the pigs and started running as fast as they could to escape the terrible wolf. He was already licking his lips thinking of such an inviting and tasty meal. The little pigs eventually managed to reach their small house and shut themselves in, barring the door.

Consider the deictic singular NP "such an inviting and tasty meal", which requires knowledge of the world to compute the metaphor. We should also note that the sentence is a case of idiomatic expression computed by the parser at grammatical level. Reference to houses is introduced in the following text, however, there is a singular little house associated to the two lazy pigs, rather than a plural one: it is clear to us that we are still

talking about a set of two houses, and this achieved by means of the possessor's cardinality. However the following text, reverts this decision, in that it makes us infer that the two little pigs are now both in the same house.

Segment C.

In the meantime the wolf was thinking a way of getting into the house. He began to observe the house very carefully and noticed it was not very solid. He huffed and puffed a couple of times and the house fell down completely. Frightened out of their wits,the two little pigs ran at breakneck speed towards their brother's house.

Problems at this point arise in the reasoning mechanism since the only singular little house available is the one built by the wise brother, Jimmy, which is picked up for coreference. This is clearly wrong, because this is not the house that gets destroyed since it is still there in the last sentence. In order to prevent a failure in the reasoning process, we simply allow reference to a little house to be inferrable as belonging to the set of two little pigs under discussion, on the assumption that it is the closest one and is available for coreference in theprevious portion of text. The inferential mechanism is always driven by a recency checker which estimates which is the closest topic being asserted: on that basis an inference is fired, and in case it is successful that topic is taken as being coreferent.

Other cases of definite NPs to be inferred from the ontology or extra-linguistic knowledge are listed in Webber's 1988 paper on CL, and are the following:

from shared culture, e.g. "the government"; the unique representative of a class, e.g. "the duck-billed platypus"; an entire class or set, e.g. "the stars"; or a functionally defined entity, e.g. "the largest tomato in Scotland".

5.Possession Relations.

The presence of a possessor is a property which adds some specificity to the head noun. In particular, it could allow to identify a certain object in the world, by the fact of its belonging to a certain possessor. In the text we analysed, the possessor is used frequently to tell different object included in a set apart, on the basis of the identity of the possessor. In particular, if we consider Segment A. again, where the text introduces a plural reference to house with the possessive pronoun "their", there are two possible inferences:

a. either the two little pigs built collectively a set of houses with two members;

b. or they built it disjointly and there is no set, contrary to the linguistic form used in the text, "their houses".

In fact, if we keep ourselves to the distributive reading induced by the presence of "each" in the previous portion of text, we are led to the conclusion that there should be three separate entities of the class "house" in the world.

However this is not actually what the text does, since I take the subsequent reference to a single house for Jimmy and a plural set for Timmy and Tommy to imply that we should consider the initial set as made up of two subsets and not of three individual entities. This is the reason of the transformation of a set with two members into a single entity, which can be used to corefer to the plural NP "their houses" in Segment A. with the NP "their small house" in Segment B. without any further specification. In turn, this latter NP

is coreferred in Segment C. simply as "the house" being the more prominent house locally available or last mentioned due to recency effects.

In the same segment we note then that in order to distinguish the reference to this now singular "house" from the other little house present in the model, this latter is evoked with a possessor's specification, "their brother's house".

To recover the identifier of that house we make the system infer a property belonging to the class "brother" and search for a fully specified individual - someone who has been given a name - and possesses a house which has been introduced as a single entity. In case every little house were introduced both as set and as single individual there would be no straightforward way to draw the necessary inference. Or at least the inferential process required to recover that individual little house would have been by far more complicated.

In particular, one would have been obliged to compute first the individual entities who possess the property of being "brother"; then, by subtraction, calculate from the possessors' identity - or their names - the single brother the genitive is now indicating. At this point the identity of the little house could be established.

We might regard the procedure by which we reached the conclusion to generalise the description of a set to the description of a single entity as a linguistically driven sloppy reading. There are empirical reasons that drove our decision: if we look at the longest version of the story of the three little pigs, we discover that it justifies our position. This is the relevant portion of text:

Segment A.

This is the story of three little pigs who went around the world seeking their fortune. Their names were Timmy, flute player, Tommy, violinist, Jimmy, great worker. As they reached a nice wood, they decided to build each a comfortable little house. Timmy didn't like working at all, so he thought to build quickly a straw hut. Soon the little house was ready and Timmy decided then to go and see what his little brothers were doing. At first he met Tommy the violinist. Also he, himself, did not have much wish to toil, so he was building a simple little house with sticks of wood.

Segment B.

Very soon, also the house of wood was ready. Like that of straw, it was not very resistant. But the two little pigs lazy had managed to finish their work in a short time and now they could enjoy themselves freely. While Timmy was playing the flute, Tommy accompanied him with his violin and together they were having a lot of fun.

Segment C.

Then, tired to make merry, they decided to go and see what their little brother was doing. They started walking and soon they reached Jimmy. The clever little pig was building a little house. But since Jimmy was farsighted and did not fear working hard, he built it with bricks and cement.

As we can see, the story starts by introducing the set of little pigs; then it assigns them names, and establishes thus their individuality. Also the little houses are introduced as sets, again by the use of a distributive quantifier. However, as the story continues, we see that each little pig builds its own little house separately. The identity of each little house is now preserved only by its specific property: in particular in Segment B. we see that in

order to cospecify each of the two little house previously introduced in text as single entities, the linguistic form used is "the house of wood", even though this was the house now under discussion. The following sentence, uses a pronoun "it" to corefer to the most recently mentioned little house and a deictic with a property, "that of straw" to corefer to the other singular little house already existing in the model. The specification of some distinctive property is now required simply because in the model there are two entities of the same class "house", both singular in number, i.e. existing as individuals, which are being further specified as "not very resistant". This property, in force of the linguistic form used in the text, is thus distributed over the two single entities.

As the story proceeds, in Segment C. we see that coreference with the little brother Jimmy is achieved as in the previous version of the story, by the use of a possessive pronoun. In this case, we might deem that the identity of the individual brother is recovered by subtraction: first, the identity of the possessor is recovered, i.e. an inference is required from the property "brother" to that of their names; then, a singular brother is searched for, whose name does not match with the ones already assigned to the possessor. However, we might also consider the possibility that the use of "brother" here is simply due to the need to assert this property and to extend it to the set of little pigs. In fact, the following sentence makes it clear to the reader that the topic is now set to Jimmy.

An important thing to notice, at this point, is the fact that the introduction of another single entity belonging to the class "house" requires the use of an indefinite NP: another possibility could have been the use of a possessive, "his little house". In both cases, the system understands that it should add a new individual of the class "house" to the model , since Jimmy does not yet own a little house - the first mention to a set of three houses is computed as an intension, or a sit, and not as a fact. However, we take the use of an indefinite NP a much simpler way to achieve the same goal. In this case, the factivity of the proposition in which the NP is used, requires the indefinite NP to be regarded as a new entity, which however is included in the set of the three little houses mentioned at the beginning of the story.

6.Proper Names

Differently from what happens with definite or indefinite NPs, notably the fact that both types can be used either extensionally or intensionally to denote some entity, in the case of proper names we know that we are always dealing with rigid designator of the same individual in all possible worlds, as Kripke defined them. A proper name fixes the reference to an individual in that it designates unambiguously that individual for any further reference in the text.

However, the mechanism by which a proper name is used in a text is something that deserves further scrutiny. In our texts, there are at least two ways to associate proper names with individual entities. The first and more canonical method is the one that is represented by a copulative construction, as in,

Example 1.

This is the story of three little pigs who went around the world seeking their fortune. Their names were Timmy, flute player, Tommy, violinist, Jimmy, great worker.

Another method, is the one represented by a predicative adjunct, as in,

Example 2.

The oldest one, Jimmy who was wise, worked hard and built his house with solid bricks and cement. The other two, Timmy and Tommy, who were lazy settled the matter hastily and built their houses with straw and pieces of wood.

These might be considered as more or less direct methods for name association with a property already existing in the world. A more subtle and indirect way of obtaining the same result is shown in the following example,

Example 3.

The three friends went all outside. As they were walking in the garden, John said to himself "Sara will marry that man", without any resentment. Richard would marry her.

In this latter example, the association is implicitly achieved by the semantic import of the structural organisation of the utterance. A pronoun is used in the subordinate clause to corefer to the property "friends" in the previous text; then, the subordinator indicates coincidence of temporal relation between the main and the subordinate clause. The main clause, in turn makes the pronoun explicit and introduces proper names as prominent characters. The inference we are naturally drawing at this point is that the Subject pronoun "they" and the Subject of the main clause point at the same individual. However since the pronoun corefer with a set with cardinality 3, we are allowed to make further inferences: we assume that also "Sara" is the name of one of the entity denoted by the set of friends. The same applies to the appearance of "Richard" in the following sentence.

How are these assumption and inferences caused: I take the association rule for proper names to be formulated as follows:

Rule for Proper Names Association

Whenever a Proper Name appears in the world, check in the model if there is already some entity associated with that name;

In case the search fails, check whether there is an explicit (direct/indirect) association link with some entity in the current clause;

Else, check whether there is an implicit indirect association link with some entity in the local context.

In other words, we always require Proper Names to be associated with some previously asserted property in the local context. However, narratives show that a proper

name could be simply introduced as such, and be a new individual in the world, as for instance in,

Example 4.
Mary picked up the phone and called Jason.

or as in,

Example 5.
John went into a restaurant.

In these last two example, proper names are used to introduce some new entity in the world and the property assumed is simply a generic class specification in terms of selectional restrictions associated to that NP as argument of a given predicate.

Names are used freely in the following text to recover coreference to a given individual. In particular, they may be used in place of a pronoun, when the text would make its use ambiguous. In the first version of the story of the little pigs, names are introduced in the story, however no other mention is needed in the following text to recover the corresponding individuals. This is simply due to the fact that they are well distinguished as being either a set of three little pigs, a set of two little pigs, and a single individual: thus, the use of names becomes redundant.

However, the second version of the same story introduces the three little pigs at first as a set with cardinality three; but as the story progresses, each of the three little pig is introduced separately by its name. This is possible because priorly there has been an explicit association of names to each member of the set of three. At a certain point of the story, it would seem that talking of a single little pig induces ambiguity, however this is not so, as shown by Segment C, which we report here below,

Segment C.

Then, tired to make merry, they decided to go and see what their little brother was doing. They started walking and soon they reached Jimmy. The clever little pig was building a little house. But since Jimmy was farsighted and did not fear working hard, he built it with bricks and cement.

Rather than using the name for the first occurrence of a reference to Jimmy, we see that the text uses "their little brother", which is clearly less individuating as the three little pigs are all brothers: but the use of the possessive makes coreference clear. In the following sentence, we see however that a name is used: is this required or is it redundant? We take the use of the proper name to be not cognitively but textually required, since the use of a common name like "the little pig" would sound unnatural. Also, note that the use of a pronoun is impossible, since "their little brother" has not been established as a current Topic.

7.Discourse Structure Representation

We take this level of representation to be composed of relations of various kinds which interact with the domain and the state of discourse in order to check for their semantic consistency. However, differently from other approaches, in our case Discourse Structure is simply the result of all previous computations: we simply let previous semantic descriptions interact with a simple algorithm that takes care of structure in terms of UP and DOWN nodes by means of carefully organized PUSH and POP actions. We have been inspired by L.Polanyi's (1988) proposal, who suggests that a structural representation should be composed of Subordination and Coordination relations between the clauses that make up the text under analysis. In our case, we see that a stretch of text or a discourse segment characterised by a set of Coordinates corresponds to a Topic Chain in which for instance, some properties of a Participant in the discourse are described.

In Polanyi's model there are four possible parses intervening between two adjacent clauses A and B at any point in the analysis:

1. A is coordinated with B.
2. B is embedded relative to A.
3. B is subordinate relative to A.
4. A is superordinate to B.

Subordinate and Coordinate Nodes are created by the algorithm as the analysis proceeds. In order to embed some clause under a Subordinate node a PUSH action is executed; to exit the stack a POP action should be performed. Coordinate nodes are usually lists of clauses at the same level of attachment. As Polanyi notes, clauses attached under the same mother are accessible and pronominalization should be expected to hold in the Topic Chain by any daughter or rightmost node. On the contrary, whenever a POP to a higher level structure obtains, we should expect pronominalization in a Topic Chain to be barred. However, in case two characters are present, a Subordinate node could indicate the local shift from one to the other of the two characters and this should be marked off by the explicit mention of some property of the entity in focus. A POP from this level could be still performed by some pronoun, provided that the other entity is coreferred by the explicit mention of a property. The same result is achieved by our algorithm of discourse structure which receives as input Discourse States and Topic Structure, as well as Discourse Relations and Temporal Relations. However, a more fine-grained description , clearly would require more local computation which could be directed at the assessment of the semantic congruence of discourse segments as they are produced independently by our algorithm. As Polanyi comments,

> "How semantic congruence is ascertained is an important issue. This process of semantic analysis is a world-knowledge and inference-driven semantic matching process making use of extra-linguistic knowledge, the meaning of the words and the structures encountered to perform an analytic and possible matching operation on the semantic values encoded in the semantic frames associated with the various nodes." (ibid.617)

Since we assume that extra-linguistic knowledge should be brought to bear independently by the system only when needed, we take semantic congruence to be just a contextually driven process.

Semantic relations in any given text are the main task to be faced when building structural representation. These relations are described by Discourse Relations and Temporal Relations. Consequently we shall label the nodes of the DSR with this information, as well as with facts or situations containing relations in which Topics are involved. We must point out that we use Discourse Relations as local markers of congruence in adjacency: no attempt whatsoever is made to build a higher structure that encompasses more clauses together. In addition, Discourse Relations are computed from aspectual, semantic category, temporal and syntactic information: differentely from what both Polany and Mann & Thompson(1987) assume we note that there is no intervention of conceptual level reasoning. As to Coordination, Polanyi says that semantic congruence is obtained by a set of Generalised Union operations on clauses which express propositions conveying the values one function (the unifying property) has for a series of alternative arguments (the coordinated properties). In our case, once Discourse Segments are built, local reasoning could be invoked in order to ascertain whether Generalised Union Operations could be performed. In her example, a coordination obtains between the following sentences:

a. John is a very good athlete.
b. He can run a four-minute mile.
c. He throws a mean hardball, too.

in which the unifying property is the one expressed by the first sentence, and the following sentences are instances of this property: they must be in an ISA Relation with one another proceeding to the right. Other conditions are represented by the fact that they should all refer to the same Participant, and they should express the "most restrictive relevant natural set", in other words, they should form a sequence from the more general to the more specific property. This is the only example she discusses in her paper, and we don't know how her theory would work on more complex cases, such as the ones we present in this paper. However, the details of the underlying mechanism are left for further research!

In our system, information on the structure of discourse can be gathered from an extensive number of sources. In particular, the Module for the Resolution of Anaphora at Discourse Level, is itself a local finite state machine that parses the text, at the level of utterances. These indications should be consistent with the DSR as proposed in what follows. Also relevant to the issue under discussion is the Rhetorical Structure Representation, where we indicate the list of Topics present in a given utterance as well as the Discourse Domain, be it Objective or Subjective, together with the Subject of Consciousness in case there is one. Finally the Main Spatial Location and the Main Temporal Location are used to assign indeces to entities in the world: they should be consistent with other discourse markers.

We could say, that every time text progression is marked by the presence of a number of clauses related to the same Main Topic, these clauses should be regarded as a Segment or an Episode at the level of Semantic Relations affecting a given Entity in the text.

Every time a New Entity is introduced in the text, some interruption is brought to bear on the DRS, and this should be captured by an upward movement from one structural level to another.

It would seem that a POP action should take place every time a new Topic is added in prominent position, and it was not included in the previous list of Topics; in addition, the new attachment level is determined by the congruence of the current Clause as to the participants in the main Semantic_Relation, to the level in which these are present as Topics. One of the prediction that the model enables us to do, is that in case Pronominalization occurs, it will affect all the Topics visible at a certain level. A POP action will cause an UP node to be produced and this in turn will indicate that a nominal head has been used to introduce or reitroduce a given Topic.

On the contrary, a PUSH action takes place every time the previous Topic, be it Expected or Main, is asserted as Secondary and there is a persistence of the same previous Topics.

The existence of a Subjective Domain with a Subject of Consciousness requires the permanence at a certain level of Coordination.

In conclusion, a Discourse Structure is a set of Segments or stretches of Discourse or Text which are marked off by nodes: the following nodes are generated by our algorithm,

1. ROOT - to mark the beginning of a story
2. UP - to mark a break in the current Segment and a movement upward
3. SAME_LEVEL - to mark a subordination or coordination of a clause to the current Segment
4. DOWN - to mark an embedding movement in the current Segment

The definition of Root is self-explanatory, and we will not comment on it. As to the UP node, it occurs whenever there is an interruption in the current Segment: this might be caused either by a return to a previous Topic by means of a nominal expression which denotes some property of the Topic, or by the appearance of a new Topic. In the former case, the algorithm will indicate clause and utterance number of the attachment node; in the latter case, the UP node will simply be attached to the root.

The Same_Level node is used to set off segments of discourse. They are so regarded by the algorithm on the basis of two main rhetorical strategies:

1. a sequence of clauses can be analysed as a Segment because of its underlying Domain, and it must be a Subjective Domain. In this case, the Discourse Focus does not move forward and is stuck to the clause setting the beginning of the Segment. Discourse Relations may either be Descriptions, Elaborations, or Explanations;

2. a sequence of clauses is analysed as a Segment because it has the same Main Topic. In this case, the Discourse Focus is moved forward and the story progresses by

enumerating a number of properties related to the same entity. Discourse Relations may be Narrations or any other previously mentioned Relation.

The second strategy is simply a Default strategy, and is clearly inherent in the first one. The Down node is used to mark off the beginning of a possible Segment of discourse, or simply a movement backward of the story where the main topic is however the same as the current one. In the latter case, a past perfect could be used to trigger the appropriate Temporal Relation, a BEFORE relation, and the related Discourse Relation, an Elaboration relation.

As a result, any reasoning based on cognitive means should build upon the structural representation as it is independently worked out by our algorithm, by adding further internal structure. We assume that conceptual reasoning implied by Rhetorical Structure Theory as proposed by Mann and Thompson, or by Polanyi could not possibly disrupt our structural representation, which is mainly Topic based and relies on local semantic relations rather than on global relations.

We include below some examples of Discourse Structures as computed by our algorithm.

```
TEXT 1.
  root:new(1-1)
  clause:1-1
  topics:[expected:id1:john]
  main_fact:give([id1:john, id3:rose, id2:mary], 1)
  temp_rel:overlap
  disc_rel:narration
  disc_dom:objective

        down:down(1-1)
         clause:2-2
        topics:[secondary:id3:rose, expected:id2:mary]
        main_fact:take([id2:mary, id3:rose], 1)
         temp_rel:after
         disc_rel:narration
         disc_dom:objective

         same_level:from(2-2)
         clause:2-3
        topics:[secondary:id3:rose, expected:id2:mary]
         main_fact:put([id2:mary, id3:rose, id8:hair], 1)
         temp_rel:after
         disc_rel:narration
         disc_dom:objective

         same_level:level(2-3)
         clause:3-4
```

topics:[main:id2:mary, secondary:id1:exist]
main_fact:know([id2:mary, id12:give], 1)
temp_rel:during
disc_rel:description
disc_dom:objective

down:down(3-4)
clause:3-5
topics:[main:id2:mary, secondary:id1:exist]
main_fact:give([id2:mary, id11:present, id1:john], 1)
temp_rel:before
disc_rel:elaboration
disc_dom:subjective

same_level:from(3-5)
clause:4-6
topics:[main:id2:mary, secondary:id17:[mary, john], expected:id16:steve]
main_fact:face([id16:steve, id17:[mary, john]], 1)
temp_rel:after
disc_rel:narration
disc_dom:objective

same_level:level(4-6)
clause:4-7
topics:[main:id2:mary, secondary:id17:[mary, john], expected:id16:steve]
main_fact:say([id16:steve, id20:enjoy], 1)
temp_rel:after
disc_rel:narration
disc_dom:objective

same_level:from(4-7)
clause:4-8
topics:[main:id2:mary, secondary:id17:[mary, john], expected:id16:steve]
main_fact:enjoy([id17:[mary, john], id17:[mary, john]], 1)
temp_rel:during
disc_rel:description
disc_dom:subjective

down:down(4-8)
clause:5-9
topics:[main:id2:mary, secondary:id16:steve]
main_fact:be([infon110:shocking], 1)
temp_rel:during
disc_rel:evaluation
disc_dom:subjective

same_level:level(5-9)
clause:5-10
topics:[main:id2:mary, secondary:id16:steve]
main_fact:be([infon110:shocking], 1)
temp_rel:during
disc_rel:evaluation
disc_dom:subjective

same_level:level(5-10)
clause:6-11
topics:[main:id2:mary]
main_fact:be([infon135:herself], 0)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

same_level:level(6-11)
clause:7-12
topics:[main:id2:mary, secondary:id16:steve]
main_fact:feel([id2:mary, infon144:[determination, hostility]], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

up:to(1-1)
clause:8-13
topics:[secondary:id2:mary, expected:id1:john]
main_fact:smile([id1:john], 1)
temp_rel:after
disc_rel:narration
disc_dom:objective

same_level:from(8-13)
clause:8-14
topics:[secondary:id2:mary, expected:id1:john]
main_fact:go([id1:john, id34:away], 1)
temp_rel:after
disc_rel:narration
disc_dom:objective

TEXT 2.
root:new(1-1)
clause:1-1
topics:[expected:id2:friend]
main_fact:go([id2:friend, id4:outside, infon15:all], 1)

temp_rel:overlap
disc_rel:narration
disc_dom:objective

same_level:level(1-1)
clause:2-2
topics:[main:id2:friend, secondary:id9:john]
main_fact:say([id9:john, id9:john, id12:marry], 1)
temp_rel:after
disc_rel:narration
disc_dom:subjective

same_level:level(2-2)
clause:2-3
topics:[main:id2:friend, secondary:id9:john]
main_fact:walk([id2:friend, id17:garden], 1)
temp_rel:during
disc_rel:parallel
disc_dom:objective

same_level:level(2-3)
clause:2-4
topics:[main:id2:friend, secondary:id9:john]
main_fact:marry([id10:sara, id11:man], 1)
temp_rel:during
disc_rel:evaluation
disc_dom:subjective

same_level:level(2-4)
clause:3-5
topics:[secondary:id2:friend, expected:id10:sara]
main_fact:marry([id2:friend, id10:sara], 1)
temp_rel:during
disc_rel:evaluation
disc_dom:subjective

same_level:level(3-5)
clause:4-6
topics:[main:id9:john, secondary:id10:sara]
main_fact:feel([id9:john, id12:this], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

same_level:level(4-6)
clause:5-7

topics:[main:id9:john, expected:id10:sara]
main_fact:be([infon91:person], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

same_level:level(5-7)
clause:6-8
topics:[main:id9:john, secondary:id10:sara]
main_fact:be([infon117:absurd], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

same_level:level(6-8)
clause:7-9
topics:[main:id9:john, secondary:id10:sara]
main_fact:be([infon130:absurd], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

up:to(5-7)
clause:8-10
topics:[main:id10:sara, secondary:id9:john]
main_fact:accept([id10:sara, id9:john], 1)
temp_rel:during
disc_rel:evaluation
disc_dom:subjective

down:down(8-10)
clause:8-11
topics:[main:id10:sara, secondary:id9:john]
main_fact:be([infon146:absurd], 1)
temp_rel:before
disc_rel:description
disc_dom:subjective

up:to(1-1)
clause:9-12
topics:[secondary:id9:john, secondary:id10:sara, expected:id20:richard]
main_fact:begin([id20:richard, id37:sing], 1)
temp_rel:after
disc_rel:inception
disc_dom:objective

TEXT 3.
root:new(1-1)
clause:1-1
topics:[expected:id1:mary]
main_fact:pick_up([id1:mary, id3:phone], 1)
temp_rel:overlap
disc_rel:narration
disc_dom:objective

same_level:from(1-1)
clause:1-2
topics:[expected:id1:mary]
main_fact:call([id1:mary, id2:jason], 1)
temp_rel:after
disc_rel:narration
disc_dom:objective

same_level:level(1-2)
clause:2-3
topics:[main:id1:mary, secondary:id8:husband]
main_fact:think([id1:mary, id10:consider], 1)
temp_rel:during
disc_rel:elaboration
disc_dom:objective

same_level:level(2-3)
clause:2-4
topics:[main:id1:mary, secondary:id8:husband]
main_fact:consider([id8:husband, infon37:[base, untruthful]], 1)
temp_rel:after
disc_rel:evaluation
disc_dom:subjective

down:down(2-4)
clause:3-5
topics:[main:id1:mary, secondary:id14:something]
main_fact:there_be([id14:[oggetto]], 1)
temp_rel:during
disc_rel:explanation
disc_dom:subjective

up:to(1-1)
clause:4-6
topics:[secondary:id1:mary, expected:id2:jason]
main_fact:answer([id2:jason], 1)

temp_rel:after
disc_rel:narration
disc_dom:objective

Dipartimento di Linguistica e Didattica
Ca' Garzoni-Moro - S.Marco 3417
Università' degli Studi - 30124 VENEZIA (It)
Tel. 39-41-5204477/5298459
Telefax 39-41-5287683
E-mail : delmonte@IVEUNCC.bitnet

- Project Manager: Prof.RODOLFO DELMONTE
- Hardware: Macintosh Quadra 950, Microvax II, PS/2 IBM
- Software: LPA Prolog, Quintus Prolog

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SOME NOTES ON NULL SUBJECTS

IN THE BRAZILIAN PORTUGUESE TENSED SENTENCES[1]

Maria Cristina Figueiredo Silva
University of Geneva
figueire@uni2a.unige.ch

1. Introduction

In the specialized literature about Brazilian Portuguese (henceforth BP), one can find two opposite claims concerning the subject position: on one hand, BP is seen as a *pro*-drop language, i.e., a language in which the subject position is not necessarily filled by a lexical pronoun; on the other hand, it is commonly observed that this language tends more and more frequently to use a lexical pronoun in subject position, especially when the required interpretation is referential.[2]

This work tries to contribute to this issue, and attemps to answer the following question: what kind of conditions regulates the distribution of empty categories and lexical pronouns in BP subject position? The data analysed suggest that BP is a partially *pro*-drop language, making use of special strategies to license a null referential subject when this position is to be interpreted referentially, differing in this regard from "real" *pro*-drop languages.

This paper is organized as follows: in section 2, a brief description of the relevant data will be presented; section 3 will be reserved for the discussion of the traditional analysis of the *pro*-drop phenomenon, a necessary step to build an alternative hypothesis, which is the topic of section 4. Section 5 concludes the discussion, showing some further problems with this new analysis.

2. The data

2.1. Root sentences. The data in (1) are the point of departure for our

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1. A very first draft of this paper was presented in the Seminario di Ricerca in Padova, on november 1992. I am gratefull to the assistence for comments and suggestions. I would like to acknowledge also the following people: B. Alber, V. Bianchi, G. Brugger, A. Cardinaletti, G. Cinque, G. Longobardi, C. Mioto, J. Nunes, C. Poletto, L. Rizzi and R. Zamparelli. All the remaining shortcomings are of my responsability.

2. By "referential" we mean the definite interpretation, the same one given to a lexical pronoun such as "you" and "he".

discussion:[3]

(1) a. Comi carne ontem.
"(I) ate meat yesterday"
b. *O que (é que) *e* comi ontem?
c. O que (é que) eu comi ontem?
"What (is that) did I eat yesterday?"

First of all, we have to show that there is no restriction acting on the subject position in the interrogative constructions of BP. This point is not trivial, considering that, in Italian, for instance, such a restriction prevents the presence of a pre-verbal subject whenever wh-movement takes place:[4]

(2) a. Cosa ha fatto Gianni?
b. *Cosa Gianni ha fatto?
c. *Cosa ha Gianni fatto?
"What has John done?"

The ungrammaticality of (2b) can be explained by the Wh-Criterion, proposed by Rizzi (1991): in Italian, the verb must move to C to satisfy the requirements of this principle; but the sentence in (2c) satisfies the Wh-Criterion and is ungrammatical anyway. A possible reason for this state of affairs is suggested by Rizzi & Roberts (1989)'s work: the movement of the verb from I to C destroys the specifier/head configuration, necessary for the assignment of Nominative Case to the subject position. Italian has to use, then, the other parametric option to assign Case: under government to the post-verbal subject position.

Concerning Case assignment, BP counts only on the specifier/head relation to assign Nominative for its subjects, which explains the paradigm in (3) below:

(3) a. *O que (é que) tinha feito o José?

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3. Two different observations must be made here. The first one concerns the judgments, which are not absolute, but must be understood in a relative way, i.e., it is the contrast that is being analyzed. The second one concerns the verbal person used in the examples: with a adequate contextualization, also null subjects of second and third person are perfectly grammatical. The fact that all root null subjects are exemplified with the first person singular is due to the presence of a morphological distinct marker on the verb, which results in an understandable sentence even without such a contextualization. Cf. Duarte(1993) for a quantificational approach to this problem.

4. This possible objection was pointed out to me by Cecilia Poletto (p.c.).

b. O que (é que) o José tinha feito?
c. *O que tinha o José feito?
"What (is that) had Joseph done?"

Hence, the ungrammaticality of (1b) cannot be attributed to Case restrictions. Notice that the presence or absence of "é que" does not modify the grammaticality judgments of the sentences in (3), which leads us to conclude that the Wh-Criterion is independently satisfied and it is not the reason for the exclusion of (1b).[5]

It seems clear that the ungrammaticality of (1b) is genuinely a problem concerning the null subject itself. Another kind of data can corroborate this hypothesis:

(4) speaker A: O José vai trazer a salada.
"Joseph will bring the salad"
speaker B: Não, O VINHO *___/ ele vai trazer.
"No, THE WINE he will bring"

Regardless of the precise analysis to be attributed to Focus structures,[6] it seems correct to state that these constructions involve the CP system, since they present strong resemblance to wh-movement.

These data suggest that the null referential subject still existing in BP has some properties in common with wh-movement, a phenomenon that requires a particular explanation.

2.2. Embedded sentences. Moreira da Silva (1984) has noticed that, in BP, a null subject in an embedded sentence can be interpreted either as co-referential to the matrix subject - what he calls "anaphoric type control" - or as co-referential to a topic - which is called "variable type control". These two possibilities are exemplified in (5) below:

(5) a. O José$_i$ disse que e_i comeu carne ontem.
"Joseph said that he ate meat yesterday"
b. A Maria$_i$, o José disse que e_i comeu carne ontem.
"Mary, Joseph said that she ate meat yesterday"

---

5. Cf. Duarte (1992) for a diachronic study about the loss of the subject-verb inversion in the interrogative sentences with wh-elements in BP.

6. See section 4.2 for few remarks about this construction.

However, more interesting is the fact that the embedded null subject cannot have an autonomous reference: the ungrammaticality of (6) shows that even the first person singular, which has available a distinctive morphology,[7] cannot be interpreted autonomously:

(6) *A Maria disse que *e* comi carne ontem.
"Mary said that (I) ate meat yesterday"

This little set of data is already enough to show that something very special should be said about *pro* if it was actually this empty category to occupy the subject position in the BP tensed sentences. In particular, this need of "control" is a symptom that referential *pro* has problems to survive in BP. In the next section, we will try to see why this is so.

3. **The traditional analysis**

The Null Subject Parameter has received much attention in recent years. To avoid a long digression about this matter, only one of the more recent and adequate formulations will be presented, that is, Rizzi's (1986) one. Following this author, the [+pronominal, -anaphoric] category, *pro*, must be submitted to two different requirements:

(7) *Pro* must be:
a. formally licensed (i.e., it must be in a certain type of relation with a zero-level category X, X being a member of the class of formal licensers in the language at issue);
b. identified in its content (i.e., it must receive its reference from the feature set of X which it is coindexed with).

To show that *pro* can be formally licensed in BP, it is necessary to resort to

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7. The paradigm of a regular first conjugation verb, like CANTAR "to sing", in the present indicative, is the following:

	singular	plural
1st. person	eu canto	a gente canta/nos cantamos
2nd. person	voce canta	voces cantam
3rd. person	ele canta	eles cantam

another class of data. Chomsky (1981) establishes a division in the class of arguments: true arguments (which potentially have a thematic role) and quasi-arguments (which, even without referential thematic roles, can be syntactically active in controlling other positions). Outside the class of arguments, there exists a class of non-arguments, represented, for instance, by the subject of raising verbs or passive constructions.

With respect to the null subjects of third person singular, BP seems to make another, slightly different kind of partition: the non-argumental or quasi-argumental subjects are systematically null, without the possibility of being expressed by a lexical expletive:

(8) a. Parece que o José passou por aqui.
b. *Isso/ele parece que o José passou por aqui.
"It seems that Joseph passed by here"

(9) a. Choveu a noite inteira.
b. *Isso/ele choveu a noite inteira.
"It was rainning all the night"

It is the expression of argumental null subjects that creates a problematic situation: if we intend to obtain the referential interpretation for the subject position, the presence of a lexical pronoun seems indispensable; otherwise, its interpretation will be necessarily arbitrary/generic,[8] i.e. the interpretation once associated with the (almost) lost clitic *se*. Compare (10a) with (10b):

(10) a. Ela nao usa mais saia.
"She does not dress skirt anymore"
b. Não usa mais saia (NURC-SP, vol.II)
"No one/no woman dresses skirt anymore"

For a sentence like (10b) to receive a referential interpretation, something more must be present either in the sentence (for instance, an explicit topic) or in the immediately precedent discourse.

The data in (8)-(10) suggest that the empty category in subject position of tensed sentences is *pro*; it is formally licensed by Agreement (as in other *pro*-drop languages) in the specifier of this functional projection, since the verb apparently reaches this head in BP (cf. Figueiredo Silva (1992), among others). In the

8. Carlos Franchi (p.c.) points out that the arbitrary and the generic interpretation are not equivalent at all, diverging semantically in a non trivial way (cf. Carlson (1977)). We will not concentrate our attention to these interpretations here, leaving open this question.

configuration Spec/head with Agr, this *pro* receives Nominative Case.

The identification of this empty category is a more complex matter. The b. part of (7) makes reference to the set of Agreement features. It is a well-known fact that the progressive loss of morphological distinctions in the verbal inflection considerably reduced the paradigm in BP: a regular verb basically counts on only three different endings (compared to six possibles different combinations of the features number and person), which mark systematically only the difference between singular and plural, but crucially not the distiction systematic between the three persons of the discourse (see footnote 7).

Concerning the identification of non-argumental and quasi-argumental *pro*, the "neutral" features of third person singular seem to be enough to allow (or, in fact, to require) the assignment of this type of thematic role to an empty category. Also the arbitrary/generic interpretation seems to be unproblematic; in fact, Rizzi (1986) has shown that this kind of interpretation only needs the presence of the number feature in the set of features that are supposed to identify it.

However, this analysis has nothing to say about the contrast shown by (1): if referential *pro* cannot be identified, why is (1a) possible at all? Or, conversely, if we consider (1a) as a residue of the *pro*-drop strategy, why would *pro* in subject position be sensitive to wh-movement? Moreover, taking in consideration the embedded contexts, why is the "control" - anaphoric or variable, in the terms of Moreira da Silva (1984) - obligatory, even when the identification of a purely pronominal empty category could, in principle, be licensed by the Agreement features?

4. An alternative analysis

We have seen that BP seems to be able to formally license (and to identify) *pro* in subject position, when it is either non-argumental or quasi-argumental. Even the argumental *pro* is possible if its interpretation is arbitrary, since, for this task, Agreement only needs to have the feature of number.

Argumental *pro* with referential interpretation is then excluded, because even if Agreement is able to formally license this empty category, the set of Agreement features cannot identify it: there is no Person feature systematically represented there.

Now, we have to look for another analysis to null subjects that is not linked to the traditional *pro*-drop strategy. It seems useful to treat separately each kind of null subject here, in order to recognize the specific aspects of each type of construction. The task of unifying them is reserved for the Conclusions.

4.1. Root contexts. The incompatibility of a root null subject with wh-movement shown in (1b) strongly suggests that the identification of this empty category is done by a different mechanism, involving an A-bar dependency. But exactly what kind of A-bar dependency?

Much recent work in this area suggest that some different relations must be recognized in order to explain different types of phenomena. One example is the case of the so-called "topic drop" in German. Cardinalletti (1990) notices that, even if both subjects and objects can be dropped in root sentences of this language, an interesting asymmetry remains to be accounted for: while subject drop can involve pronouns specified for any person, object drop is restricted to third person pronouns. It is clear, then, that two different strategies are being used here.

Rizzi (1992) proposes that "classic" analysis of topic drop can be maintained to the object case, having the following representation:

(11) $[_{CP}$ OP habe $[_{IP}$ ich *t* gestern gekauft]]
"(This) I have bought yesterday"

whereas the subject case would be better analyzed as a case of a null constant, an empty category that can be interpreted directly in discourse. The author suggests a grammatical representation which makes crucial reference to the fact that German is a V-2 language:

(12) $[_{CP}$ *nc* habe $[_{IP}$ *t* es gestern gesehen]]
"(I) have bought it yesterday"

Spec CP can be an A-position in V-2 languages, which qualifies to host the null constant. Aside some problems that this analysis could arise (for instance, the representation in (12) requires a slight different definition for ECP, since the null constant is not a [+pronominal] category), it is clear that (12) capture the basic freedom of reference for the null subject in German.

However, this hypothesis is hardly useful to explain the BP data, since this language has V-to-C movement, not even in residual cases: interrogative inversion, Aux-to-Comp and similar structures are all excluded in this language (cf. Figueiredo Silva (1992)). Moreover, dropped subjects in German are excluded from embedded contexts, V2 or not, even in presence of a very favorable contextual saliency:

(13) a. Hans glaubt *(ich) habe es gestern gekauft.
b. Hans glaubt daß *(ich) es gestern gekauft habe.
"Hans believes that I have bought it yesterday"

BP null subjects cannot be assimilated to the object topic-drop in German either, given its freedom of reference: in an appropriated context, null subjects of all persons are grammatical, in root and embedded contexts.[9]

It seems that the partial *pro*-drop character of BP can give us the key to solve this apparent paradox. We have seen that *pro* is formally licensed and partially identified by Agreement. Suppose that *pro* can be considered formally licensed, even if it has to find the lacking feature for its identification in the CP system.[10]

But what kind of relation can *pro* enter in order to complete its identification? One could think, for instance, of a base-generated relation, yielding (14) below as a possible representation for (1):

(14) $[_{CP}$ OP <+person>$_i$ $[_{IP}$ *pro*$_i$ comi carne ontem]]

The ungrammaticality of (1b) is immediately accounted for: the specifier of CP is already occupied by the null operator responsable for the identification of the person feature for *pro* in subject position. Or conversely, Spec CP is already occupied by the wh-phrase so that no null operator is possible and the null subject is excluded.

However, (14) is not the only possible grammatical representation for (1). Another structure giving the same result for root null subjects would be (15) below:

(15) $[_{CP}$ *pro*$_i$ $[_{IP}$ t_i comi carne ontem]]

Here, the relation between *pro* in Spec CP acting as an operator and the trace in subject position is the one created by movement; the presence of *pro* in Spec CP excludes the possibility of another movement to this position, straighforwardly ruling out (1b).

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9. A particular case, very resistent to the null strategy is the expression "a gente", which is replacing more and more the traditional "nos", eliminating also the verbal desinence corresponding to first person plural. In Portuguese, the positive answer to a yes/no question is made with the verb in the correspondent person, i.e.:

(i) Speaker A: Ele foi? (Did he go?)
Speaker B: Foi. (Goes)

But, even in this type of salient context, an empty category cannot be interpreted as first person plural if the verb is in the third singular form:

(ii) Speaker A: Voces vao? (Do you(pl.) go?)
Speaker B: Vamos/*vai (Go(1.pl)/*goes)
(cf.: A gente vai) (cf. We go)

10. This assumption must be taken as a "working hypothesis", which is yet to be tested from a comparative point of view. Maybe some reconstruction phenomena are at work in these cases.

How to choose between these two possible representations? The predictions made by each one are similar in root contexts, but very different in embedded sentences: following general assumptions, a representation such as (14) would allow non-local dependencies, but (15) predicts islands effects to the null subject referential interpretation. Moreover, beyond the empirical adequacy, we have to pay attention to the theoretical content of each such representation, in order to allow for one or another structure to stand for the null subject in BP tensed sentences.[11]

4.2. Embedded Contexts. Recall that we have recognized two types of embedded null subjects: following the terminology proposed by Moreira da Silva (1984), we have called them respectively "anaphoric type control" , when the embedded subject is co-referential with the matrix one; and "variable type control", when the embedded subject is co-referential with a phrase in the matrix initial position. These two types of null subjects were exemplified in (5), repeated here:

(5) a. O José$_i$ disse que e_i comeu carne ontem.
"Joseph said that (he) ate meat yesterday"
b. A Maria$_i$, o José disse que e_i comeu carne ontem.
"Mary, Joseph said that (she) ate meat yesterday"

However, Moreira da Silva's work does not make any precise claim about the position of the fronted phrase, neither about the interpretation that this kind of sentence must receive. In fact, (5b) can be interpreted either as a focused phrase (with a contrastive reading, implying uniqueness) or as a left dislocated constituent (with an "additional" reading, not necessarily implying uniqueness). Clearly, each of them has its own grammatical structure: the focused phrase is generally supposed to occupy Spec CP (or a higher position, but with an empty operator in Spec CP), since it is incompatible with wh-movement:

(16) speaker A: A Maria disse que vai comer aqui.
"Mary said that (she) will eat here"
speaker B: (Não) *A JOANA onde ela disse que vai comer?
"(No) JOAN where did she say that (she) will ...

while the left dislocated phrase seems to occupy an adjoined position, out of the sentence, giving rise to a grammatical interrogative sentence:

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11. On theoretical grounds, it seems that (14) is not a well-formed representation: it is a well-know fact that empty operators are intrinsically 3rd. person.

(17) speaker A: Ele disse que a Maria vai comer aqui.
"He said that Mary will eat here"
speaker B: E a Joana, onde ele disse que vai comer?
"And Joan, where did he say that (she) will ...

The left dislocation structures are grammatical even if the "dislocated element" is not lexically represented, being part of the precedent discourse:[12]

(18) speaker A: Cadê a Maria?
"Where is Mary?"
speaker B: Eu acho que *e* ja foi embora.
"I think that (she) already went out"

Even if these constructions are very different in essence, to avoid a longer list of data, we will choose one of them to take in consideration here: left dislocation structures seem to be more "elastic" in that they do not require specific contexts to be used, and they offer an additional possiblity of representation: the one exemplified in (18), with a null topic, clearly impossible with focalised elements, which cannot be null.[13].

This point fixed, we can try to decide the precise nature of the relation between the empty category in subject position and its A-bar binder; for this task, we can use some well-known tests, involving strong and weak islands.

At this point, we have to bring additional BP data. In (19) below, we can see the results of a null subject embedded in a wh-island; in (20) the results concerning complex NPs with a relative clause; the cases regarding an adjunct clause are shown in (21), while in (22) we can see two islands being transgressed. The (a) sentences show the "variable-type control" and the (b) ones, the "anaphoric-type control":

(19) a. O Pedro$_i$, eu não sei pra quem e_i vai dar o convite.
"Peter, I do not know to whow (he) will give the invitation"
b. Eu não sei pra quem *e* vou dar o convite.

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12. Some speakers feel a difference in grammaticality between focused and left dislocation structures concerning the possibility of null subjects. As far as I can see, in the dialect spoken in Sao Paulo, both constructions are fine in a context like (5b).

13. Cinque (1990) analyses (object-)left dislocation as a base generated relation, minimally differing from topicalization, which is an instance of wh-movement. Here, we will suggest a parallel treatment for (subject) left dislocation and topicalization, a move not directly compatible with his analysis. Some further investigation of BP data is in order to make precise its relation with the Italian one.

"I do not know to whom (I) will give the invitation"

(20) a. *O Pedro$_i$, eu achei um carro que e_i tem grana pra comprar.
"Peter, I found a car that (he) has money to buy"

b. *Eu achei um carro que *e* tenho grana pra comprar.
"I found a car that (I) have money to buy"

(21) a. *A Maria$_i$, o José olha pro pé toda vez que e_i fala com ele.
"M., J. looks at his feet whenever (she) speaks to him"

b. ?Eu olho pro pé toda vez que *e* falo com o José.
"I look at my feet whenever (I) speak with Joseph"

(22) a. *O Pedro$_i$, a Maria olha pro pé toda vez que alguém comenta o livro que e_i escreveu.
"Peter, Mary looks at her feet whenever someone comments the book that (he) wrote"

b. *Eu olho pro pé toda vez que alguém comenta o livro que *e* escrevi.
"I look at my feet whenever someone comments the book that (I) wrote"

From all these data, the most interesting case is the one exemplified by (21), which suggests an irreducible difference between the "anaphoric-type" control and the "variable-type" control, inviting to treat them as two distinct constructions.

We will start with the "variable-type control" structure, which seems to behave in a well-known way. In fact, its systematic sensibility to all strong islands provides a good evidence to choose the movement analysis represented in (15), repeated below:

(15) $[_{CP}\ pro_i\ [_{IP}\ t_i$ comi carne ontem]]

Recall that, according to this analysis, in root clauses, *pro* is moved to Spec CP to receive the lacking feature of person from the discourse; in this position, *pro* can bind the trace in subject position; the same configuration is valid for embedded contexts of the type "variable-type control": one was exemplified in (18), displaying a structure like (23) below:

(23) $[_{CP}\ pro_i\ [_{IP}$ Eu acho $[_{CP}\ t_i$ que $[_{IP}\ t_i$ ja foi ...

in which *pro* is interpreted as co-referential to "Maria", mentioned in a previous discourse; the other was the sentence (5b), which has a full NP left dislocated, displaying a structure like (24) below:

(24) $[_{CP}$ A Maria$_i$ $[_{IP}$ o José$_j$ disse $[_{CP}\ t'_i$ que $[_{IP}\ t_i$ vai comer ...

The impossibility of a sentence like (20a) is the presence of the relative operator in the intermediate Spec CP; the movement has to cross three barriers: the most embedded IP, the intermediate (non-selected) CP and the matrix IP, giving rise to an ungrammatical sentence. In the "weak island" case, exemplified in (19a), an indirect question is select by the matrix verb, but not the complex NP. Nor the adverbial clause has this property, and the contrast directly follows.

The cases of "anaphoric type control", exemplified in the b. sentences from (19) to (22) cannot be analysed in the same way. It is clear that the strucure proposed in (23) cannot account for the contrast between (21a) and (21b).

We have no concrete proposition to make here, but we will suggest some lines of research in the next section.

5. Conclusions

We have pursued the answer for a very specific question concerning the structure of the null subject contructions: what kind of conditions regulates the well-formedness of an empty category in subject position of a tensed sentence in BP?

We have supposed that the empty category in subject position is actually a *pro*; nonetheless, Agreement is able to formally license it but to supply only the number feature necessary to the identification of *pro*. Then, *pro* must have some kind of relation with a position sensitive to the person feature present in the discourse. What position can it be? The answer seems to be: in the specifier of the highest maximal projection of the sentence, Spec CP.

However, in principle, we could have two possible grammatical representations for the relation between *pro* and Spec CP, one implying movement of *pro* from the subject position to Spec CP, the other implying base generation of a null operator in Spec CP. Both representaions explain the contrast seen in (1), but only the movement analysis is able to capture the facts involving embedded null subjects of the type "variable type control". This is the reason why we have adopted the representation proposed in (15), repeated here, in root contexts, giving rise to (23) and (24) in embedded contexts:

(15) $[_{CP}\ pro_i\ [_{IP}\ t_i$ ...
(23) $[_{CP}\ pro_i\ [_{IP}\ NP_j$ ... $[_{CP}\ t_i$ que $[_{IP}\ t_i$ ...
(24) $[_{CP}\ NP_i\ [_{IP}\ NP_j$ ... $[_{CP}\ t'_i$ que $[_{IP}\ t_i$ ...

All the islands effects are naturally derived from the fact that Spec CP is already fulfilled by the relative pronoun in the case of (20a), the wh-word in the case of the

adjunct sentences in (21a) and the two occupied Spec CP that must transpassed in (22a).

Something more must be said concerning German: why is it not possible to move a *pro* in this language to Spec CP? The answer is not completely clear at this point of the work, but it is reasonable to suppose that this difference between BP and German is derived from the conditions of formal licensing: BP has *pro* which is formally licensed and only partially identified, but German has no way to formally license *pro*, at least not so freely as BP. More work is in order to make precise this point.

But what about the "anaphoric-type" control cases? It seems clear that the analysis suggested above cannot represent this type of null subject; apart empirical reasons (the contrast between (21a) and (21b), the representation suggested in (15) is not a theorical possible output: the final configuration would be:

(25) $[_{CP}\ pro_i\ [_{IP}\ NP_i \ldots [_{IP}\ t_i \ldots$

and we would have a variable bound by *pro* in an A-bar position that is locally A-bound. Also an R-expression coindexed with a c-commanding pronominal in an operator position is a situation not admitted by Universal Grammar, which requires an R-expression to be free. The conclusion seems to be that the "anaphoric type control" does not make use of an A-bar dependency.

At this point, one could think that in fact this is a trivial case of co-reference between an embedded *pro* and the matrix subject. Nonetheless, this empty category also has surprising properties if it is taken as a real pronominal. Pronominals can be either free or bound, but the embedded null subject in BP can never be free - recall that it is never referentially autonomous (cf. the example in (6)). Also split antecedents for this empty category are excluded:

(26) *O José$_i$ disse que a Maria$_j$ pensa que e_{i+j} vão morar juntos
"Joseph said that Mary thinks that (they) will live together"

Nor is it possible for the embedded null subject to take a "remote controller" (for example, the subject of a higher sentence) or an object as binder:

(27) a. *A Maria$_i$ disse que o Pedro acha que t_i vai ganhar.
"Mary said that Peter thinks that (she) will win"
b. *A Maria convenceu o José$_i$ que t_i devia sair.
"Mary convinced Joseph that (he) should leave"

These properties are recognized in Chomsky (1986a) as the pronominal properties of PRO. If the embedded null subject of BP cannot display this behavior, it is clear that it is not a pronominal.

Moreover, the locality plays a crucial role in the "anaphoric type control". The exact nature of this relation is a rather complex matter, which will be appropriated studied in a future work.

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ENCLITIC ARTICLES AND DOUBLE DEFINITENESS:

A COMPARATIVE ANALYSIS OF NOMINAL STRUCTURE

IN ROMANCE AND GERMANIC[1]

Giuliana Giusti
University of Venice

1. Introduction

Although very different from both the typological and the genetic point of view, Scandinavian and Romanian share two important phenomena concerning nominal structure: the enclitic nature of the definite article and its (optional) cooccurrence with a demonstrative. The two cases are exemplified in (1) and (2) respectively:

(1)	a.	(i)	un om	(ii)	om*ul*	(Romanian)
	b.	(i)	en man	(ii)	mann*en*	(Mainland Scandinavian)
			a man		man-the	
(2)	a.	(i)	acest om	(ii)	omul acesta	(Romanian)
			this man		man-the this	
	b.	denna man%(nen)		(Mainland Scandinavian)		
		this man-(the)				

The examples in (1) show an apparently complete parallelism between the two languages. In fact, in both the indefinite article precedes the noun while the definite article follows it in the form of a suffix. The examples in (2), however, already reveal a considerable difference between the two languages. In Romanian (2a) the optionality of the article is related to the presence of two different constructions with a prenominal (2a.i) or a postnominal (2a.ii) demonstrative. In Mainland Scandinavian (2b), on the contrary, the optionality of the article appears to be a matter of dialectal

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1. This is the written version of a paper presented at the 8th Workshop on Comparative Germanic Syntax that was held in Tromsø on November 20-22. I would like to thank the audience and the organizers for comments and support. A revised version of this paper will appear in the proceedings of that conference which will be published as a special number of *The Linguistic Review*.

variation.[2]

Another important difference to be noticed in nominals concerns the position of an adjective in the string. In Romanian (3) we can have either a prenominal or a postnominal adjective in both indefinite and definite nominals. In Scandinavian (4) we can have only prenominal adjectives. In indefinite nominals (4a) they are placed between the article and the noun, in definite nominals (4b) what appears to be an expletive article is inserted at the beginning of the string:

(3)	a.	(i)	un bătrîn om "an old man"	(ii) un om bătrîn
	b.	(i)	bătrînul om "the old man"	(ii) omul bătrîn
(4)	a.	(i)	en gammal man	(ii) **en man gammal
	b.	den gamle[3] man%(nen)		

In (4b), the symbol % signals a dialectal variation with respect to the presence/ absence of the enclitic article cooccurring with the expletive article. Interestingly this does not coincide but only overlaps with the dialectal variation noticed with the demonstrative above.[4]

Even a rough picture such as the one just sketched suggests that a trivial unification of these facts is hardly feasible. But it also urges for parallelisms that should not get lost. A coherent analysis of these and related data should face these two aspects of the problem. This is the purpose of the paper.

In section 2., I will first propose an analysis of the syntax of the suffixed article in the two types of languages, deriving the different behaviour in the presence of an adjective from an independetly motivated property of N-movement in Germanic vs. Romance. In section 3., I will turn to how this property interacts in the two types of language with the insertion of a demonstrative.

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2. With respect to this problem it seems quite difficult to draw a clearcur betwee the two variants in that the occurrence of the suffixed article is banned by the academy of certain national languages but used in the spoken languages. It can be roughly stated that Swedish allows it freely, including the formal language, Norwegian allows it only in some spoken variants, while Danish does not display it at all.

3. The different ending of the adjective is independently due to the alternance strong/ weak adjectival inflection in Germanic. I will not enter into this question here. For some proposals see Giusti (1992), Tappe (1990), Olsen (1989).

4. In this case, it is apparently easier to draw a clearcut between the two variants: Danish does not allow the suffixed article, the rest of the Mainland Scandinavian family does. I learn from Sigurðsson (1992) that Icelandic behaves like Danish in this respect. Unfortunately I have not enough data to investigate this language as it deserves.

2. Enclitic Articles

Dobrovie-Sorin (1988), Grosu (1988) for Romanian, Taraldsen (1989), Delsing (1988) for Scandinavian, propose that the head noun moves to D° in the sytax to incorporate the suffixal article. A straightforward prediction of this proposal is that every element found between the indefinite article and the noun be postnominal in a definite noun phrase, as is the case in Romanian (5b), but contrary to fact in Scandinavian (6b):[5]

(5)	a.	un	bătrîn	om	(Romanian)
	b.	$omul_i$	bătrîn	t_i	
(6)	a.	en	gammal	man	(Scandinavian)
	b.	*mannen	gamle/gammal	t_i	
		"an old man/ the old man"			

As shown in (4b) above, Scandinavian inserts a morphologically unbound article in this case, and variation is found regarding the possibility for the suffixal article to surface:

(7)	a.	den gamla mannen	(Swedish/ Norwegian)
	b.	den gamle mand	(Danish)

Notice that Romanian cannot make use of this choice (8a) in all cases, even though it does display an unbound article, as is the case with a numeral adjective (8b):[6]

(8)	a.	*cel bătrîn om(ul)	(Romanian)
		the old man	
	b.	cei trei oameni	
		the three men	

If we take Danish as our point of reference for Scandinavian, (7b) is suggestive that in the presence of an adjective the morphology *-en* of the article is not affixed on

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5. Taraldsen (1990) discusses some variants of Norwegian in which the noun can move across a possessive element:
   a. mitt hus
      my house
      (i) huset mit
      house-the my
   I will discuss of this phenomenon in the last part of the paper. From now on, let us therefore abstract away from it.

6. *Cel* is the adjectival article in Romanian and functions as the adjectival nominalizer on a par with *d-* in Scandinavian. I will not deal with this question here. For a possible analysis see Giusti (1992).

the noun but on a dummy root *d-*, namely the root of demonstratives which is the base of the articles in all other Germanic languages.

I do not think, however, that Danish should lead us to assume that the adjective in (7) blocks a sort of head-movement which would otherwise take place in a simple nominal, such as *mannen* in (1b.ii). In fact, unless we want to analyse adjectives as intervening heads in the nominal structure, I see no reason why a maximal projection (either an adjunct or a specifier)[7] should give any blocking effect for head-movement. An alternative proposal could be to assume that nothing at all moves in the syntax in Scandinavian, and in particular that (1b.ii) is not the effect of N°-movement.

In a minimalist framework such as the one presented in Chomsky (1992), the different behaviour of Romanian and Scandinavian could be trivially formulated by stating that the noun is inserted already inflected for the affixal article in the base and the affix is checked by N-movement to D before "spell-out" in Romanian and after "spell-out" in Scandinavian. Notice that the same sort of difference appears to hold independently in a broader Romance/ Scandinavian comparative perspective with respect to shorter N-movement to intermediate Agr° projections.

2.1. N-movement across Western Europian Languages. Apart from Walloon, as discussed in Bernstein (1991), all Romance languages currently dealt with in the literature appear to have postnominal adjectives. Cinque (1990, 1992) dispenses with previous analyses in terms of quite anomalous structures with adjectives right adjoined to some nominal projection or even in complement position, and proposes to view postnominal adjectives as the result of short movements of the head noun across some SpecAgrP specifiers, on line with Picallo's (1990) proposal of N-movement across genitival arguments.

In other words, Cinque assumes a unified base structure for Romance (Italian in (9) here) and Germanic (English in (10) here) with all adjectives in left-branching SpecAgrP positions and derives the postnominal position of most adjectives in Romance by moving the head N to an intermediate functional head, Agr° in (9b). This movement appears to be disallowed in Germanic (10b):

(9)	a.	un		vecchio	uomo
	b.	un	$uomo_i$	vecchio	t_i
(10)	a.	an		old	man
	b.	*a	man_i	old	t_i

If Cinque is correct in analysing the impossibility of postnominal adjectives in Germanic as the result of the impossibility of short N-movement, given the local nature of head movement, it is reasonable to assume that N in Germanic cannot go

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7. I will not take stand here on the problem whether an adjective is a modifier of the noun (as proposed by van Riemsdjik (1992)) or in the Spec of intermediate AgrP projections (as proposed by Cinque (1990, 1992). For the sake of exposition I will adopt Cinque's framework in the rest of the paper.

on long movement to D in the syntax. This is what I am assuming here.[8] The different structures for the simple cases in Romanian and Scandinavian respectively are given in (11):

(11) a. $[_{DP}\ [_{D°}$ om-ul$_i]\ [_{Agr}\ [_{Agr°}\ t_i]$ etc. $[_{NP}t_i\ ]]]$
b. $[_{DP}\ [_{D°i}]\ [_{AgrP}\ [_{Agr°i}\ ]$etc. $[_{NP}$ mann-nen$_i]]]$

In (11a), N° in Romanian moves to D° in the syntax building a chain with all intermediate heads. In (11b), D° and all intermediate functional heads are coindexed with the morpheme inserted onto the head noun, which will be checked at LF.

What remains to be explained now is: a) why the adjective in Scandinavian requires lexical insertion in D° before "spell-out"; and b) what morphological property gives us the dialectal variation found in (7). I will try to answer the first question in the rest of this paragraph. The answer to the second question will be given as a substantial part of the treatment of double definiteness developed in the next section.

2.2. *D° as SpecAgrP licencer.* In Romanian, all prepositions except *cu* ("with") produce the following effect: when their complements are interpreted as definite, they cannot display a definite article if they are unmodified (12), but the article reappears if they are modified (13):[9]

(12) a. l-am văzut pe profesor(*ul)
[I] him-have seen PE [the] professor
b. îţi mulţumesc pentru scrisoare(*a)
[I] you[dat.] thank for [the] letter
(13) a. l-am văzut pe profesor*(ul) tău
[I] him-have seen PE professor-the your
b. îţi mulţumesc pentru scrisoare*(a) interesantă
[I] you[dat.] thank for letter-the interesting

Notice that when an unmodified noun is in not embedded in a PP, it must have an article:

(14) a. profesor*(ul) a mers la Paris
professor-the has left to Paris
b. am citit scrisoare*(a)
[I] read letter-the

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8. In this framework this is the null hypothesis, the burden of the proof is therefore set on a competing hypothesis that N in Scandinavian can exceptionally go on long movement only in the case in which D° is definite and no other element thn the noun and the D itself is inserted.

9. If they are indefinite an indefinite article id regularly inserted.

The contrast in (12)-(14) can be captured by the following generalization: In Romanian, the lack of the definite article in referential noun phrases is directly linked to the presence of a preposition, while the additional presence of a modifier brings about the surfacing of the article again.

A similar phenomenon can be found in Italian prepositional circumstantial complements. Although it is by no means as regular and clear as in Romanian, in Italian, some circumstantial prepositional complements must have no article when they embed a bare noun with a particular interpretation, which for our purposes here, we may label as "salient" in some sense:[10]

(15) a. vado a scuola
I go to school
b. siamo in giardino
we are in [the] garden

(16) a. vado in *(una) scuola privata/ a*(lla) scuola elementare
I go to *(a) private school/ to *(the) elementary school
b. sono in *(un)/ nel giardino comunale/ fiorito/ d'inverno
we are in *(a)/ *(the) communal/ flowered/ winter garden

Even if it is not clear why the article should be missing in (15),[11] it is apparent in (16) that the presence of a modifier (either an adjective or a genitive) makes the article necessary again, and may cause a change in the selection of the preposition.

I would like to propose that the definite article is a syntactic functional element the insertion of which is not necessarily dependent on the (in)definite interpretation of the nominal itself.[12] I also propose to interpret the evidence presented in this paragraph as indicating that a definite article must be inserted in D° in order for the D° to licence the Spec position of the nominal AgrPs where adjectives are inserted. If no Specifier position needs to be licensed, languages may vary with respect to their realization of D°.

3. Double Definiteness

Even if the cooccurrence of a demonstrative with a definite article - often referred to as double definiteness - appears to a certain extent both in Romanian and in Scandinavian, it cannot be straightforwardly derived from the enclitic nature of the article in these two languages, since it is also found in a whole group of languages

10. Notice that the English glosses display an alomost parallel situation, reinforcing the claim that we are facing a general phenomenon.

11. See Longobardi (1992) for some hints of an explanation.

12. Cf. [references to be quoted in the final version] for a more detailed presentation of this proposal.

very different from the point of view of the position of the article. The following examples as taken from Delsing's (1988) quotation of Lundeby (1965):

(17) a. Greek: autòs o aner
"this the man"
b. Macedonian: toj čovek-ot
"this man-the"
c. Gothic: þan wig jainan
"the way this"
d. Romanian: omul acesta
"man-the this"

In (17) four possible combinations of pre/post-nominal demonstrative and prenominal/ enclitic articles are represented. Notice that completely unrelated languages can fit in the pattern such as Indonesian and Hungarian, which pattern with Greek (cf. Heinrichs (1974) and Szabolcsi (1992) respectively). Notice also that those Scandinavian variants that display double definiteness appeat to pattern with Macedonian.

In what follows, I will not attempt a general explanation of this phenomenon, given that we do not have sufficient information about the properties of nominal constructions in most of the relevant languages. Furthermore, we do not know whether such an account should rule out the logically possible sequences "Art Dem N" and "N Dem Art" or not. Instead, I will start with an analysis of the Romanian construction, building on what is already known of the nominal construction in this language; I will go on to show that this analysis cannot be extended straightforwardly to Scandinavian, where it is due to other properties of the nominal system.

The leading idea will be that demonstratives do not pertain to the same structural position as articles. As a consequence, wherever these two categories appear in the structure, they could - in principle - cooccur. What should be considered as surprising, then, is the number of languages in which they never cooccur. The latter cases are analysed in [references to be given in the final version] as instances of a sort of "doubly-filled DP filter". I will adopt this analysis with no further discussion here.

3.1. Double Definiteness in Romanian. Notice, first of all, that Romanian displays two semantically equivalent constructions, only one of which dispalys double definiteness:[13]

(18) a. acest om
"this man"
b. omul acesta
"man-the this"

13. The choice between the two types is governed by pragmatic rules, cf. Tasmowki (1990).

Only when the demonstrative is postnominal can and must the preceding N be articulated. The position of the postnominal demonstrative is fixed: it must be second in the nominal string (19a); no other position is possible:

(19) a. omul acesta bătrîn
b. *omul bătrîn acesta

The second position in the nominal string, however, is not sufficient to characterise the Romanian demonstrative in double definiteness constructions: it must be specified that the demonstrative must be preceded by an articulated noun (cf. (19a) and (20b):

(20) a. bătrînul om
b. *bătrînul acesta om

In previous work (cf. Giusti (1992)), I have proposed and further supported the following analysis, exemplified in (21). The demonstrative is not in D° but in the immediately lower Spec. (This accounts both for the cooccurrence of -art and Dem and for the word order). Being in a Spec position, Dem allows N°-movement to D°, as in (21a), but blocks AP-movement to Spec DP which is otherwise possible in Romanian, as in (21b). (This accounts for the impossibility of (20b) with respect to the acceptability of (20a)). The extra *-a* morpheme displayed by the demonstrative in second position (cf. *acest* in (19a) and *acesta* in (19b)) is due to agreement between the trace of N movement in the Agr° of which Dem occupies the Spec position. The construction with a prenominal demonstrative, on the other hand, is due to Dem movement to Spec DP, as in (21c). This movement fulfills the requirements set on DP in the syntax and therefore blocks further N-movement to D° before "spell-out". The impossibility of double definiteness with a prenominal demonstrative, as in (21d) is due to the SpecDP FIlter motivated in Giusti (1992):

(21) a. $[_{DP}\ [_{D°}om_i\text{-}ul]\ [_{AgrP}\ acest\text{-}a_i\ [_{Agr°}\ t'_i]\ etc.\ [_{NP}t_i]]]$
b. $[_{DP}\ bătrîn_i\text{-}ul\ [_{D°}]\ [_{AgrP}\ (*acest\text{-}a)\ [_{Agr°}]\ etc.\ t_i\ [_{NP}\ om]]]$
c. $[_{DP}acest_j\ [_{D°}\ ]\ [_{AgrP}t_j\ [_{Agr°}\ ]\ etc.\ [_{NP}\ om]]]$
d. $[_{DP}acest_j\ [_{D°}\ om_i\text{-}ul]\ [_{AgrP}t_j\ [_{Agr°}\ t'_i]\ etc.\ [_{NP}\ t_i]]]$

Since Romanian is completely paralell to well-studied languages with respect to the prenominal demonstrative construction, I proposed there and assume without further discussion here that Italian, French, English, etc. also have a demonstrative in SpecDP and that in these languages no alternative to Dem-movement[14] to SpecDP is present

14. Or, maybe, direct insertion to DP, since the child has no evience of a different base position for Dem.

due to independent lack of N° movement to D° in the syntax.[15]

Summing up, double definiteness in Romanian appears to be the result of N°-movement to D° which makes it possible for a demonstrative to remain in place in SpecAgrP.

3.2. Double Definiteness in Scandinavian. In Scandinavian, matters are considerably different: First the demonstrative not only precedes the noun but also all nominal modifiers; thus it cannot be argued that it is in a Spec position lower than SpecDP. Second, its cooccurrence with the eclitic article is a matter of dialectal variation, not of different constructions. To further complicate the picture, double definiteness can also appear when the non-clitic article is inserted in D° in the syntax to licence an adjective in a lower Spec.
The following chart is taken from Svenonius (1992), which takes into consideration the possessive too:

(22)

	Norw.	Sw.	Dan
Poss.	-	-	-
Dem	+	-	-
d-art	+	+	-

Let us consider first the case of the double article construction. The assumption of two DP projections, one lower and the other higher than the adjectives, would wrongly predict the possibility of a double article construction with no adjective and an unstressed *d*-article. It would also have difficulties in accounting for its non-occurrence in Danish. I propose that the morpheme found on the head noun in Norwegian and Swedish when the *d*-article is present is checked as an agreement morpheme on the noun. This approach can account for the dialectal variation just assuming that only Norwegian and Swedish have this morphological agreement of N° with D°, while Danish does not. Since variation, especially among close related languages, is at best reduced to morphological variation, this can be taken as the null hypothesis. If we consider the enclitic article in double article constructions in Norwegian and Swedish as no D°, but simply as an agreement morpheme between N° and D°, we are led to assume that this is also the case in the other double definiteness construction. The cooccurrence of Dem with the apparent enclitic article in Scandinavian, is therefore reduced to the property of Dem, in certain variants, to trigger morphological agreement with the head noun. Demonstratives and possessives are structurally in the same position, the only difference being that possessives in Spec DP do not trigger agreement on the head noun in any Scandinavian variant. The structures are given in (23):

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15. I am talking about common nouns here. Proper nouns appear to be a completely different matter (cf. Longobardi (1992)).

(23) a. $[_{DP}\ [_{D°}den_i]\ [_{AgrP}$ gamle $[_{Agr°i}]$ etc. $[_{NP}mannen_i]]]$
b. $[_{DP}$ denna$_j$ $[_{D°i}\ ]\ [_{AgrP}\ t_j\ [_{Agr°i}\ ][_{AgrP}$ (gamle) $[_{Agr°i}\ ]$ etc. $[_{NP}$ mannen$_i$ $]]]$
c. $[_{DP}mitt_j\ [_{D°}\ ]\ [_{AgrP}\ [_{Agr°}\ ]$ etc. $[_{NP}\ t_j\ [_{N'}$ hus]]

3.3. Possessive constructions in Norwegian. Up to now, I have considered the Scandinavian N° as "frozen" in its base position, abstracting away from the Norwegian cases discussed by Taraldsen (1990), in which the noun can move across a possessive:

(24) a. mitt hus
my house
b. huset mitt
house-the my

Although I agree with Taraldsen in considering (24b) as evidence for some kind of N°-movement, I believe that this is not the case of N-movement to D. In particular, I think that the possessive in (24b) is not in the same position as in (24a).

To show this, let us insert an adjective in the construction represented in (24a): The AP appears in prenominal position but after the possessive and requires no *d*-article, as in (25a), but if we insert an adjective in a construction such as (24b), it still appears in prenominal position and requires the *d*- article, as in (25b):

(25) a. mitt store hus
b. det store huset mitt

The parallelisms between the a.-examples on the one hand and the b.-examples on the other show that in the first case the posessive is in DP and, therefore, can and must dispense with an article. In the second case, on the contrary, the possessive can in no ways be considered as in DP. Where is it then?

In Cinque (1990, 1992), Crisma (1992), it is argued that there are two positions for the possessive adjective, one inside NP (in which the possessive is base generated and assigned a θ-role or an R-relation by the noun), and one higher in the nominal structure in which it must move for some unclear reason (possibly genitive case assignment). The first assumption is mainly drawn from theory internal resons (θ-role and R-relation should be assigned locally by the head noun), the second is strongly supported by empirical evidence (the possessive is in well-studied languages the first or one of the first modifiers of the noun phrase).

The property of being generated in one position and moved to another is reminiscent of the behaviour of subjects in certain languages. This is a welcome parallelism, since possessives can in many ways be considered as subjects of the nominal phrase. Not in all languages must subjects be moved from their base position. In some cases they may remain where they are base generated. This is what I am going to assume for Taraldsen's cases.

When possessives are not moved to SpecDP, they cannot block insertion of the

enclitic agreement morpheme to be checked in D°, and can be crossed over by the head noun because they are so embedded in the structure. They are in fact the only evidence we have that the head noun moves one step at least in these dialects. [16]

4. Conclusions

In this paper, I have attempted a comparative analysis of enclitic articles and so-called "double definiteness" in Romanian and (Mainland) Scandinavian. In so doing, I have first argued for a parallel analysis of enclitic articles in the two types of language, accounting for all the differences in complex structures by means of different times of application of the same movement: N°-movement to D° applies in the syntax in Romanian and at LF in Then I have analysed double definiteness in the two types of language as the result of relatively different phenomena. This is not undesired since "double definiteness" appears to be a spurious generalization parallel to the one implicit in the term "determiner". Throughout this paper, in fact, I have assumed and only partly motivated what I have argued for in Giusti (1992), namely that different determiners occur in different position, and in particular demonstratives and possessives appear in Specifier positions while articles are heads.

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16. Notice however that no thematic adjective behaves like possessives, as is expected under this approach. Since adjectives are currently taken to be unable to move, a possible way out of this should be to assume that they are actually generated in a different position (i.e. a Spec immediately higher than the one where the possessive is generated). However this is not the place to pursue such an analysis.

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SUBJECT CLITIC / VERB INVERSION

IN NORTH EASTERN ITALIAN DIALECTS

Cecilia Poletto
University of Padova/ University of Venice

1. Introduction

The general aim of this paper is to show that a quite complicated mass of data, which at first sight appears contradictory, can be traced back to the interplay of a quite restricted set of principles and parameters. A comparative approach to the problems of language analysis gives us a direct insight into universal grammar, helping us to trace the limit between variation and constant syntactic features of natural languages.[1]

In particular we will try to provide an analysis of the distribution of the phenomenon known as subject clitic/verb inversion, present in a lot of Northern Italian Dialects as (a) illustrates:

(a) Quando vien*lo?*
When comes+he?

Inversion will turn out to be an instance of a principle that applies to interrogative sentences in all languages. In particular it will be shown that the structure of examples like (a) is exactly the same as that postulated for French cases of subject clitic/verb inversion as (b):

(b) Quand vien-t-il?
When comes-he?

Three different dialects will be taken into consideration in section 2: Paduan, Venetian and Triestino, which share the same subject clitic system in assertive contexts but differ with regard to the way in which a main question is expressed. The differences noted will be traced back to the combination of a general principle about

1 I am deeply indebted to Adrian Battye, Adriana Belletti, Paola Benincà, Guglielmo Cinque, Maria Teresa Guasti, Richard Kayne, Luigi Rizzi, Ian Roberts, Alessandra Tomaselli, Laura Vanelli, and Raffaella Zanuttini for helpful comments and discussion. All errors are naturally my own.

interrogative structures with a parametric choice regarding the syntactic head that can be marked as [+wh], namely [+interrogation] in root questions.

The examination of five cases of apparently exceptional behaviour of interrogative structures in section 3, will confirm some distinctions already noted in the literature as for instance, the asymmetry between ergative and unergative verbs, or the one between *yes/no*-questions vs. *wh*-questions. Many problems will be only mentioned but will serve as a starting point for further research or willl be left open for closer examination, as they lie beyond the scope of this paper.

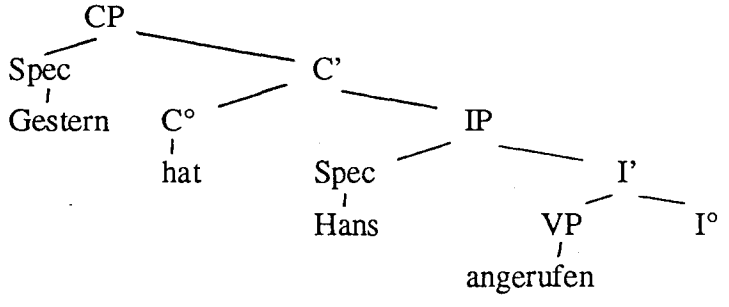
In order to explain the inversion phenomenon of the inflected verb with a subject clitic, I will make use of a recent theory proposed in Rizzi (1990) for interrogative sentences. Rizzi examines a well known puzzle of English grammar: subject auxiliary inversion in interrogative contexts.

(1) a. What did John eat?
b. *What John ate (did eat)?
c. I wonder what John ate
d. *I wonder what did John eat

(1) illustrates the distribution of the inversion phenomenon: in (1a) an auxiliary verb appears in front of the subject NP John. If inversion does not apply in main contexts the sentence is ungrammatical, as in (1b). The situation is reversed in embedded questions: if inversion applies, the sentence is excluded, as (1c-d) show.

The distribution of interrogative inversion in (1) is reminiscent of the asymmetry between main and embedded contexts noted for verb second phenomena in other Germanic languages such as German and Mainland Scandinavian, in which the inflected verb is rigidly placed in second position only in matrix clauses. The contrast between matrix and embedded contexts is currently analyzed as movement of the inflected verb to the head of the CP projection, as in (2):

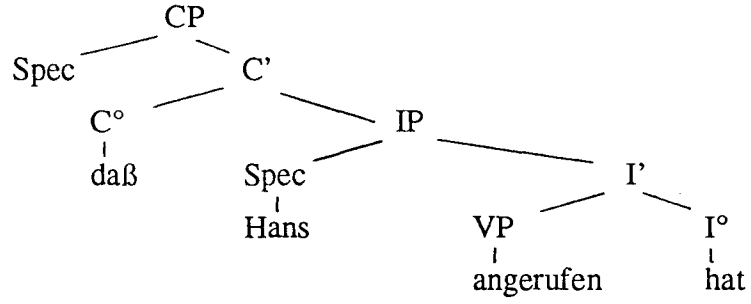
(2) a. Gestern hat Hans angerufen
Yesterday has John telephoned
b.



In embedded contexts the inflected verb cannot move to C, because the position is already filled by a complementizer, hence it has to stay in Infl as in (3):

(3) a ... daß Hans angerufen hat
... that John telephoned has

b.



The contrast between (1a-b) and (1c-d) parallels the contrast between (2) and (3), and can be treated in the same way: in English main interrogatives the auxiliary moves to C, while in embedded questions it cannot, because the position is already filled by the complementizer. English differs from other Germanic languages because the movement of the inflected verb (which can only be an auxiliary or a modal verb) to C is restricted to interrogative contexts, and not obligatory in every main clause.

In order to capture this fact, Rizzi proposes that a *wh*-criterion is considered universal grammar. It states that a *wh*-operator and a *wh*-head must be in a Spec-head configuration at the relevant grammatical level which can be S-structure or LF, depending on the language:

(4) A. a wh-operator must be in a Spec-head configuration with a head marked [+wh]
B. a head marked [+wh] must be in a Spec-head configuration with a wh-operator

The principle in (4) guarantees that a *wh*-operator moves to SpecC and the head marked [+wh] moves to C in order to enter the relevant Spec-head configuration. In English main interrogatives the head marked [+wh] is Inflection, therefore the inflected auxiliary (which is in I) moves to C and the *wh*-item moves to SpecC. Both clauses of the *wh*-criterion are thus satisfied by the Spec-head configuration at the CP level be tween the *wh*-item and the inflected auxiliary.

In English, only auxiliary verbs can move to C in interrogative sentences, because only auxiliaries occupy Infl: main verbs never move to Infl (cf. Pollock (1989) for a detailed analysis and an explanation). Hence, they are never marked as [+wh].

In embedded contexts the head marked [+wh] is not Inflection, but C, through selection by the matrix verb. Hence only the *wh*-item needs to move to SpecC, and both clauses of the *wh*-criterion are satisfied.

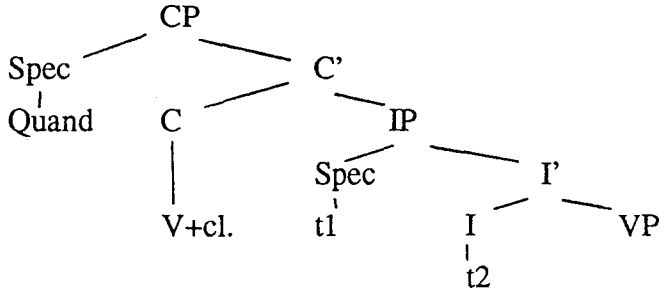
The auxiliary does not move to C in embedded contexts. It need not because C already meets the *wh*-criterion. What is more, it must not because the movement would cover the selectional features in C, violating the projection principle, which

states that a feature generated at D structure cannot be cancelled.[2] The asymmetry between main and embedded interrogatives results thus from the interplay between the wh-criterion and the projection principle. In section 2 we will see that a parameter regarding the head which can be marked with the feature [+wh] in root questions is necessary to explain the data of some Northern Italian Dialects.

The *wh*-criterion functions at S-structure in other European languages exactly as described for English. In French there is evidence that the head of IP moves to C only in main interrogative sentences (cf. Kayne (1972) and Rizzi and Roberts (1989)). The French construction known as Inversion can be analyzed as movement of I to C, plus the incorporation of a subject clitic from the subject position SpecIP into C:

(5) a. Quand est-il venu?
When is-he come?

b.



c. *Quand est-Jean venu?
When is John come?

In (5) the inflected verb moves to C to be in a Spec-head configuration with the wh-item *quand*, leaving the trace t2 in Infl.

The subject clitic moves from the subject position SpecI to C and incorporates into the inflected verb, leaving the trace t1 in SpecI.

In Rizzi and Roberts' (1989) analysis this process of incorporation is necessary in order to satisfy the condition that every NP must be "visible" at S-structure. In French, contrary to what happens in English, the relevant configuration for Nominative case assignment is only Spec-head agreement. In other words the head of IP cannot assign Nominative through government from C, but only through Spec-head agreement from I.[3] In root interrogative structures this configuration is destroyed by the movement of the inflected verb to C.

2 Rizzi (1990) admits a strong version of the projection principle, for which every feature generated at D structure cannot be erased in the course of the derivation.

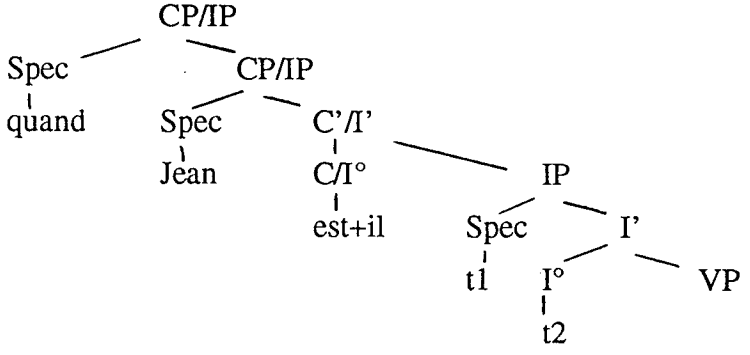
3 Roberts (1990) formulates the difference between English and French as a parameter on the assignment of Nominative which can apply through government or through Spec-head agreement: English exploits both possibilities while French permits only the second one.

This is the reason why (5c) is excluded: the Subject NP *Jean* does not receive Nominative from the verb *est* which has moved to C, as the relevant configuration of Spec-head agreement is not satisfied. In French root interrogatives the visibility principle must be met through another mechanism, namely incorporation of a subject clitic.

Complex inversion allows a subject NP to appear between the *wh*-item and the verb, as in (6a). In Rizzi and Roberts' analysis, the coalescence between the head C and the head I permits the creation of a new argumental CP-Specifier where the subject NP can receive case through Spec-head agreement with the head of Infl, as in (6b):

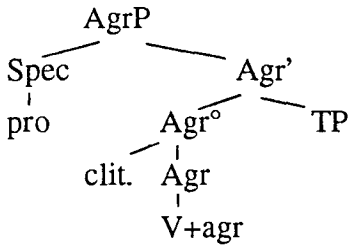
(6) a. Quand Jean est-il venu?
When John is-he come?

b.



In Complex Inversion the CP/IP has two Spec positions: one non-argumental and one argumental, the non-argumental Spec is occupied by the *wh*-item, the argumental Spec is occupied by the subject NP. Northern Italian Dialects also show inversion of the inflected verb and a subject clitic. This phenomenon is nevertheless different from the French one, because only a sentence like (5a) but not one like (6a) (but cf. Roberts (1990)), is grammatical. In the following presentation of the inversion conditions in some eastern varieties, we will assume that subject clitics in the Northern Italian Dialects are not true NPs as French subject clitics are, but heads adjoined to the head of Inflection, as proposed by Brandi and Cordin (1981) and (1989), and by Rizzi (1986). Updating their analysis we will assume that the structure of the verbal inflectional features can be split into two distinct syntactic heads: Tense, and Agreement (cfr. Pollock (1989)), which have both their own maximal projection. AgrP is higher than TP (as proposed by Belletti (1990)) in the syntactic structure of the sentence; subject clitics are adjoined to the head of the higher functional projection, AgrP, as in (7):

(7)



Northern Italian Dialects are *pro* drop languages like Standard Italian: as can be seen in (7), a *pro* occupies the subject position, SpecAgr.

The three varieties that we will examine share the same subject clitic system: they have only three subject clitics out of six persons: only second person singular, and third person singular and plural present subject clitics as in(8):

(8) a. Vegno
(I) come
b. Te vien
You come
c. El vien
He comes
d. Vegnemo
(We) come
e. Vegni
(You+plur) come
f. I vien
They come

We will assume that the mechanism for the licencing of a null subject is identical to Standard Italian, namely Spec-head agreement with the head of AgrP for the persons that do not show any subject clitic. In the case of second person singular and third person singular and plural, subject clitics have the same function that agreement morphology has: they are needed for *pro*.

This amounts to saying that a subject clitic is the element that identifies the person and number features of the *pro* through Spec-head agreement in these dialects, because the verbal morphology does not have enough features to do it.

The parallel between agreement morphology and subject clitics is nevertheless incomplete. While agreement morphology is always present, even if SpecAgr is filled by a subject NP and not by a *pro*, subject clitics are in complementary distribution with phonetically realized subject NPs. As shown in Poletto (1990), they cannot cooccur with another thematic subject in an argumental position, as a subject NP in Spec Agr, or a variable, trace of a *wh*-subject as (9a/c) show:

(9) a. *Nisun el vien

Nobody cl. comes
b. *Chi credito che el vegna?
Who believe+you that cl. comes?
c. *El puteo che el vien vanti
The boy that cl. comes along
d.*El pare che...
Cl seems that...

Moreover, a subject clitic as the ones described here, cannot occur if a theta role has not been assigned to the subject, as for instance with weather verbs, as in (9d).

Subject clitics are similar to object clitics because they are arguments, even if they are heads, because they absorb a theta role. The pro-drop of these dialects is thus partially different from the pro-drop in Standard Italian, because it is the subject clitic that identifies the *pro* in SpecAgr and not Agreement itself.

This characterization of subject clitics as argumental heads that identify the pronominal empty category in SpecAgr (as in (7)), will be relevant to understanding the distribution of subject clitics in interrogatives of Paduan, Venetian and Triestino.

2.1. Paduan: A case of Generalized inversion. As mentioned, Paduan has inversion of the subject clitic with the inflected verb in interrogative contexts:

(10) a. Vienlo?
Comes-he?
b. *El vien?
He comes?
(11) a. Quando zelo vegnuo?
When has-he come?
b. *Quando el ze vegnuo?
When he has come?

In (10) and (11) only the sentences in which the subject clitic appears on the right of the inflected verb are grammatical. (10b) and (11b) are ungrammatical as true interrogative sentences. They can be interpreted only as echo-questions.[4] The phenomenon of inversion recalls the English interrogative subject auxiliary inversion and the French inversion cases which can be analyzed through Rizzi's *wh*-criterion. It is tempting to assume that subject clitic/verb inversion in Paduan is an

4 Echo questions have a different structure; for instance *wh*-items *in situ* are permitted in Standard Italian only in echo contexts but not in normal questions:
(i) Gianni ha fatto COSA? ("John has done what?") (i) can only be interpreted as an echo-question with a pitch accent on the *wh*-item. We will concentrate here on normal questions or correction contexts.

effect of the same principle of the grammar which induces the inflected verb, that carries the feature [+wh], to move to the head of the CP projection in order to be in a Spec-head configuration with the *wh*-operator in SpecC. If the *wh*-criterion is the source of the inversion phenomenon in Paduan, we predict that it applies only in root contexts because, as seen in 1.2, in embedded sentences the *wh*-criterion is already met by the C head through selection and the inflected verb is not marked [+wh]:

(12) a. Me domando cosa che el fassa
Me (I) ask what that he does
b. *Me domando cosa (che) falo
Me (I) ask what (that) does he

Inversion is a root phenomenon in Paduan too, as (12) shows. In an embedded interrogative as (12a) the subject clitic is on the left of the inflected verb and the sentence is grammatical. A complementizer is phonetically realized in C, even if the SpecC position is filled by a *wh*-word. In (12b) the subject clitic is inverted on the right of the inflected verb, and the sentence is ungrammatical, no matter whether the complementizer is realized or not. The contrast between (11) and (12) leads us then to assume that inversion in Paduan is a reflection of the same principle that triggers inversion in English and French, namely the *wh*-criterion.[5]

If inversion in Paduan parallels the corresponding French construction in (5), then the analysis could be exactly the same as for French: when the inflected verb moves to C, the context of Nominative case assignment is destroyed. Hence, a subject NP cannot be realized in SpecAgr and only a subject clitic can occupy that position, and be incorporated into the inflected verb in C, becoming visible at S-structure. In fact sentences like (13), in which a subject NP remains in SpecAgr, while the inflected verb goes to C, are excluded both in French and in Paduan (cf. Kayne (1972)):

(13) a. *Quand est Jean venu?
When is John come?
b. *Quando ze Nane vegnuo?

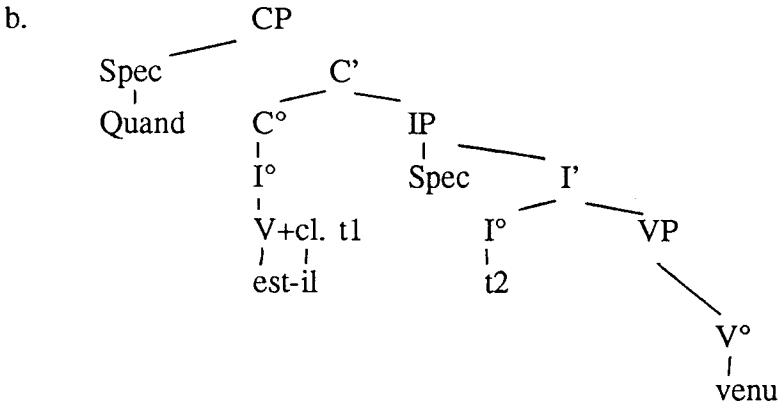
The only difference between Paduan and French would be that in Paduan no argumental SpecC is created, and a sentence like (6a) (here repeated as (14a)) is ungrammatical (but see fn. below for discussion).[6]

5 Paduan represents an even clearer case of complementary distribution in C between the inflected verb and the complementizer because che (that) must always be realized in embedded questions, even if the SpecC is filled by a *wh*-item. This option is not open in Standard Italian, French and English.

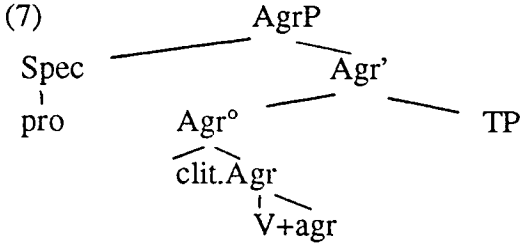
6 Here we are following Rizzi and Roberts (1989).

(14) a. Quand Jean est-il venu?
When John is-he come?
b. *Quando Nane zelo vegnuo?
When John is-he come?

We could admit that Paduan is exactly like French, apart from this difference, and that a structure like in (5b) is valid in Paduan too:



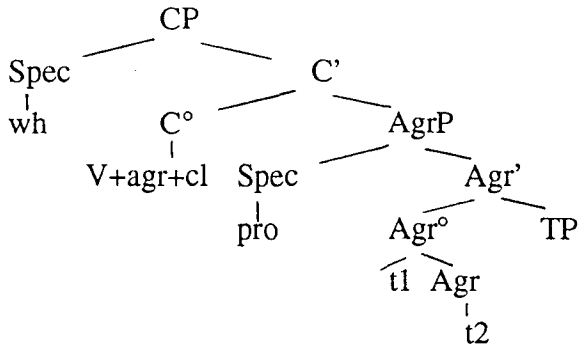
In a structure like (5b) the trace of the subject clitic is in SpecAgr, hence the clitic is a true NP. In section 1.2 we mentioned the fact that Northern Italian Dialects, differently from French, are pro-drop languages, and subject clitics are heads adjoined to the head of Agr as in (7) (here repeated), hence not true subject NPs:



If we want to maintain the structure of the language in general and subject clitics in particular as a constant, and this seems the most natural thing to do, we have to admit that Paduan is a pro-drop language in interrogative main contexts too, and that the subject clitics that appear in interrogative main clauses are heads exactly as subject clitics in assertive contexts are. Thus, a structure like (5b), which is formulated for a non pro-drop language like French, cannot be used for Paduan.

The structure (5b) can be modified as (15) in which the subject clitic does not incorporate from the SpecAgr position but from an adjunct position to Agr:

(15)



In (15), t1 is the trace of the subject clitic that has incorporated into C from the Agr-adjunct position and t2 is the trace of the inflected verb (V+agr) moved to C. Both the movement of the inflected verb and that of the subject clitic are instances of head to head movement.A *pro* is realized in SpecAgr, as in assertive contexts.A structure like (15) seems to be a plausible candidate for explaining sentences like (10)-(11): it holds constant the characterization of Paduan subject clitics as heads and the possibility of a pronominal null subject in SpecAgr.

Let's verify if this hypothesis is true: are interrogative subject clitics identical to assertive subject clitics and is Paduan *pro* drop in interrogative contexts too?As mentioned in section 1.2, in Paduan the series of subject clitics is not complete: there are only three subject clitics for second person singular, third person singular and plural in assertive sentences, as the schema in (16a) illustrates :

(16) a.	1	2	3	4	5	6
	-te	el/la	--	i/le		
b.	1	2	3	4	5	6
	ito	lo/la	io	li/le		

If interrogative subject clitics are the same as assertive subject clitics, the number and the morphology of the two series should be the same. The series of subject clitics in interrogative matrix sentences is as in (16b).

A comparison between (16a) and (16b) immediately reveals that assertive clitics are different from interrogative clitics: the number and the morphology of subject clitics in main interrogatives are distinct from those unassertive contexts.

While in assertive sentences as (17a) (18a) and (19a) first person singular and plural and second person plural do not show any subject clitic, neither at the right nor at the left of the inflected verb, in main interrogative sentences with first person and second person plural,a subject clitic at the right of the verb is obligatory:

(17) a. Go da fare na roba
(I) have to do something

b. Cossa goi da fare?
What have I to do?
c. *Cossa go da fare?

(18) a. Ghemo da fare na roba
(We) have to dodo something
b. Cossa ghemoi da fare?
What have we to do?
c. *Cossa ghemo_ da fare?

(19) a. Gavì da fare na roba
(You+plur) have to do something
b. Cossa gavio da fare?
What have you (plur.) to do?
c. *Cossa gavi_ da fare?

(17b-c), (18b-c) and (19b-c) show that in main interrogative sentences the subject clitics are six, and not three, as expected. This observation leads us to admit that subject clitics in interrogative sentences belong to a different series from assertive clitics. Paduan has thus two distinct series of subject clitics: one for assertive and embedded interrogative contexts, and one for main interrogative sentences. A structure like (15) is based on the assumption that assertive subject clitics and interrogative subject clitics are the same, which is not true. Thus (15) cannot explain why a distinct series of subject clitics is necessary in main questions, and what are the features that distinguish them from assertive clitics may be. Hence it is not the right structure for Paduan main interrogatives.

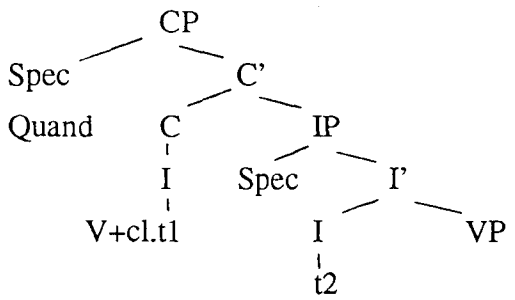
A step in the right direction can be made observing that interrogative subject clitics are a complete series: six clitics out of six persons, just like in a non *pro* drop language as French.

If we put these observations together with the fact that interrogative subject clitics are morphologically distinct from assertive subject clitics, we come to the conclusion that the difference between assertive and main interrogative contexts in Paduan is the same as that found between two languages such as Standard Italian and French, namely pro-drop. In other words, our hypothesis is that Paduan ia a pro-drop language only in assertive and embedded interrogative clauses: in direct questions the structure is such that a *pro* results ungrammatical.

At the beginning of this section we noted that inversion in Paduan seems to parallel French inversion structures:

(20) a. Quando zelo vegnuo?
When has-he come?
b. Quand est-il venu?
When has+he come?

c.



We are thus claiming that Paduan main questions have the same structure that French inversion has, namely (20c).

This amounts to saying that the Paduan series of interrogative subject clitics is parallel to French subject clitics: they are not heads adjoined to Agr, as assertive subject clitics are, but NPs in SpecAgr. These are then incorporated into C because the SpecAgr position does not get Nominative case assigned through government (as proposed by Rizzi and Roberts (1989) for French cf. 1.2.) The visibility condition is satisfied through incorporation of the subject clitic and the sentence is grammatical because the trace in SpecAgr is properly governed by its antecedent in C.Through the assumption that inversion in Paduan is parallel to French (5b) we can explain why the interrogative series has to be complete for all persons, and why it is morphologically different from the assertive series: interrogative clitics are not heads, but NPs. The series is complete because no *pro* can be licensed. Hence a subject pronoun must always be expressed as in all non pro-drop languages.

But why should the mechanism of pro-drop be blocked only in direct interrogatives? It seems plausible to try to connect this effect with the movement of the inflected verb to C.

In interrogative main clauses the *wh*-criterion forces the movement of the inflected verb to C, in order to create the Spec-head configuration between the *wh*-item and the head marked [+wh]. In Rizzi and Roberts' analysis this movement destroys the context of Nominative case assignment in French: no subject NP can occupy the SpecAgr position because it would violate the visibility condition.

As noted in section 1.2, this analysis is based on the assumption that the relevant configuration for Nominative case assignment in French is only Spec-head agreement between the subject NP and the inflected verb and not government from C. Spec-head agreement is the relevant structural relation for pro-drop too: as mentioned in section 1.2 assertive sentences in Paduan are pro-drop, even if the mechanism of identification of the features of the null element are different from Standard Italian (cf. Poletto (1991)). The relevant configuration for pro-drop in Paduan is thus Spec-head agreement, as it is for case assignment.

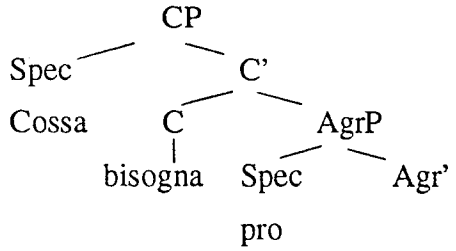
We are thus making the hypothesis that in Paduan the domain of Nominative case assignment is coextensive with the domain of *pro* drop (cf. Chomsky (1982)). Only the Spec-head configuration is relevant for a null pronominal subject, as it is for a phonetically realized subject NP. If the element that is coindexed with the *pro*

moves up to C, the relevant configuration of licencing, namely Spec-head agreement, is destroyed as is Nominative case. Hence, the movement of the inflected verb to C makes it impossible to realize a subject NP in SpecAgr, both in French and in Paduan. It also makes it impossible to licence a *pro* in that position: only subject clitics can fill the SpecAgr position and then incorporate into C.

Consider now cases such as (21):

(21) a. Cossa bisogna far?
What needs to do (fut)?
What is necessary?

b.



c. *Quando vien?
When comes?

In (21a) the subject of the verb *bisognar* (to be necessary, which does not assign an argumental theta role, is not phonetically expressed. Hence, in the structure of a sentence like (21a) there must be a *pro* in SpecAgr: we must admit that an expletive *pro* is grammatical in main questions.

Our first hypothesis is too strong: Paduan is indeed *pro* drop in interrogative sentences too, but only for expletive subjects. In the case of a personal subject, structure (21b) is banned, as (21c) shows. The contrast between (21a) and (21c) indicates that the ungrammaticality of structures like (21c) must depend on a special characteristic that only an argumental *pro* has. The difference between an expletive *pro* and an argumental *pro* is that an expletive *pro does not need any identification of its number and person features, because it has none, while an argumental pro* needs person and number features, because it has a content to be recovered.

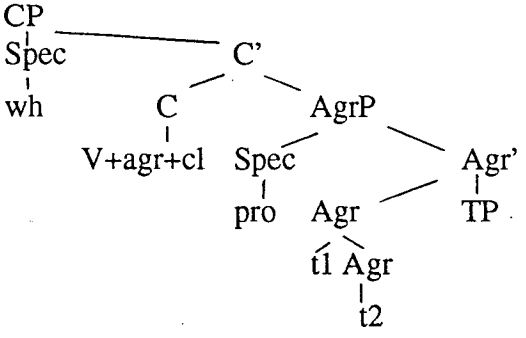
On the basis of the contrast between (21a) and (21c), we can state that the ungrammaticality of (21c) is due to the impossibility of identifying the features of the personal pro: the configuration of government is a possible configuration for the licencing of the empty category *pro*. Hence the acceptability of (21a), where the expletive *pro* only needs to be licensed.

Nevertheless the person and number features cannot percolate down along the tree from C to SpecAgr. Only through Spec-head agreement can an argumental null subject be assigned its contentive features. The result is that the distribution of an argumental *pro* coincides with that of Nominative case assignment. The necessity of a subject clitic for all persons in interrogative main clauses in Paduan is ultimately due to the fact that government is not an appropriate configuration for assigning its

identification features to a null pronominal argumental subject. This hypothesis relates the particular configuration which can be found only in main interrogative sentences to the complete paradigm of subject clitics: when the inflected verb is moved to a higher projection, a *pro* cannot be identified in SpecAgr.

This is the reason why an assertive subject clitic cannot appear in interrogative contexts, as in (22b). A structure like (15) (here repeated as (22a)) is ungrammatical because the element that shouldassign its contentive features to pro, namely the verbal inflection or the subject clitic, has been moved to C:

(22) a.



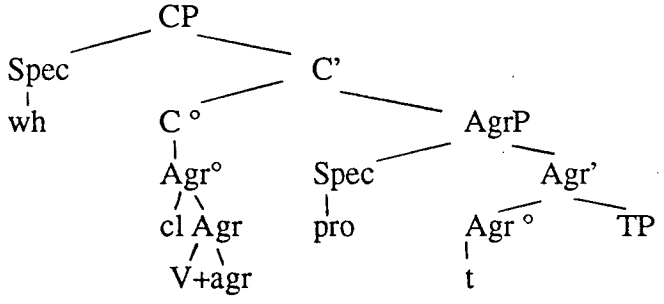
b. *Quando vienel?
When comes+assertive clitic?

Our assumption correctly excludes (22) which is ungrammatical because the content of the argumental *pro* cannot be recovered.

Another possibility which comes to mind and is not realized in Paduan, corresponds to a structure like (23b), in which the verb moves to C with the clitic at its left. (23b) could be a plausible configuration but it has to be excluded, as (23a) shows. In other words, why can't the higher Agr projection containing both the inflected verb and the subject clitic be moved to C as in (23b)?

(23) a. *Quando el ze vegnuo?
When he is come?

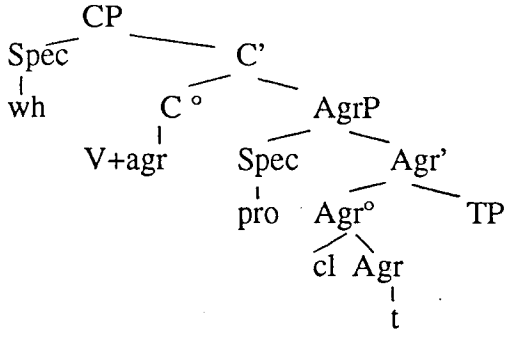
b.



There is no universal principle of the grammar that prevents such a movement of the higher head of Agr, hence we have to attribute the unacceptability of (23) to a particular choice that the grammar of Paduan makes. [7]

In (23b) a *pro* appears in SpecAgr, and it must be identified by an element in C through government. This is just the configuration that we excluded for Paduan: government is not relevant for the identification of a pro. Only Spec-head agreement is a relevant configuration for the transmission of the person and number features to the null subject. Our hypothesis excludes (23b)on a par with (22) without any additional condition. An explanation in these terms entails that another possible structure, that has not been taken into account up to now, must be excluded too: the verb could move alone from Agr to C leaving the subject clitic in its adjunct position to Agr:

(24) a.



b. *Quando ze el vegnuo?
When is he come?

In this way, the *wh*-criterion would be satisfied by the inflected verb moved to C, and the *pro* would be identified through Spec-head agreement by the clitic that has remained in Agr.

Is there a reason why the clitic cannot stay in its position, when the verb moves to a higher head? The question is controversial: a configuration like (24a), in which the clitic intervenes between the verb and its trace *t* in Agr, should be excluded because it has a minimality effect, being a nearer head to the trace then the verb, thus preventing it from being correctly identified as the trace of the verb. (cfr. Baker (1988)) I won't go into detail now, mentioning only the fact that the ban against a structure like (24) does not seem to be a peculiarity of Paduan, because, to my knowledge, no Northern Italian Dialect (nor French) admits (24b) as a possible sentence. If this is true, then (24a) has to be excluded in terms of a general condition, and not as an idiosyncratic property of the dialect in question.

Paduan results thus to be much more similar to French than one would presume: the structure of Paduan inversion is exactly parallel to French inversion. The only difference is that in French the coalescence between C and I permits the formation of an A SpecC position, that in Paduan is not found. This is clearly a

7 There are in fact dialects that exploit this possibility, as, for instance, some Romagnolo varieties.

marked mechanism that French exploits, and it is not surprising to find that it is not realized in Paduan. There is nevertheless a principled reason to exclude Complex Inversion in Paduan: subject clitics in Paduan are always argumental, in the sense that they absorb a theta role. In section 1.2 we considered the case of assertive clitics, that, being similar to object clitics, require a theta role to be assigned by the verb. Interrogative subject clitics are arguments too, as can be seen from examples as(25): [8]

(25) a. *Vienlo qualcheduni?
Comes+cl somebody?
b. Vien qualcheduni?
Comes somebody?

In (25a) the interrogative subject clitic and the subject NP *qualcheduni* are incompatible, because they absorb the same theta role. In fact, if the interrogative subject clitic is not present, a subject NP can be realized in an interrogative as (25b). Hence, interrogative subject clitics are arguments in Paduan as their assertive counterpart are. At this point it is easy to see why a Complex Inversion structure like the French one is impossible: Rizzi and Roberts' hypothesis is crucially based on the fact that the inverted subject clitic is an expletive, while the subject NP in the argumental SpecC gets the subject theta role assigned. If Paduan has only argumental interrogative subject clitics which absorb the subject theta role, then a subject NP cannot be realized in any position inside the sentence because it would be left without a theta role, thereby violating the theta criterion. Complex Inversion can thus be excluded for a principled reason: in Paduan it would lead to a violation of the theta criterion.

The fact that interrogative subject clitics are arguments is important for another reason: looking at inversion in sentences like (10) and (11) it could be proposed that the subject clitic is totally clustered inside the verbal morphology, constituting a sort of interrogative inflectional paradigm as in many African languages. The question now is: can a part of inflection absorb a theta role? This would be a very strange situation: a part of the morphological features of a verb should be sensible to the theta criterion. On the contrary, it seems to me that the fact that subject clitics behave as arguments shows that they are not analyzed by the speakers as verbal morphology, but as syntactic elements, thus submitted to syntactic and semantic constraints such as the theta criterion.

2.2 Venetian: Losing inversion. Venetian is a dialect spoken in the town of Venice and in surrounding areas. It has to be distinguished from the rest of the Veneto dialects, because it is losing inversion.

Let's render this affirmation more precise: inversion is nowadays restricted to a limited number of verbs, which do not seem to share any syntactic property. On the

8 We use a quantifier subject in the example to exclude cases of right dislocation of the subject NP

contrary they can be defined in morphological terms as a natural class (as P. Benincà pointed out to me) They are all athematic verbs as in (26) and (27): [9]

(26) a. Dove valo?
Where goes+he
b. Cossa falo?
What does+he
(27) *Cossa magnelo?
What eats+he?

Inversion seems to be restricted by a morphological condition sensitive to the class of the verb. (26a-b) are grammatical because the verb belongs to the relevant morphological class, while (27) is out, because the verb is not an athematic verb. Even if restricted, inversion shows the same asymmetry between main and embedded contexts noted for Paduan in section 2.1. Only in matrix sentences can the verb appear at the left of a subject clitic as in (28a), inversion being excludedfrom embedded sentences as (28b):

(28) a. Cossa falo?
What does+he
b. *Me domando cossa (che) falo
(I) ask me what (that) does+he

If Venetian shows the same asymmetry that verb second structures typically reveal, then it obeys the same principle to which Paduan, French and English are submitted: the inflected verb marked [+wh] has to move to C, in order to be in a Spec-head configuration with the wh-item. This happens only in matrix clauses because there is no selection from a matrix verb that attributes the wh-feature to C, as is the case in embedded contexts (cfr. section 1.2). The only condition that distinguishes Venetian from Paduan and from French is a morphological restriction that limits the domain of inversion to a specific morphological class of verbs.[10]

We will then assume that the *wh*-criterionis active in Venetian too, under the same conditions under which it is in English, French, Standard Italian and Paduan. If

9 An athematic verb can approximately be defined as a verb which lacks the thematic vowel.

10 Venetian was exactly like other Paduan varieties till approximately the last century: inversion was the normal way to express a direct question. The following examples, drawn from Goldoni plays, show that inversion was identical to Paduan, as described in section 2.1
(i) Cossa diseu de sti spassi che vemo vuo? (Goldoni, I Quattro Rusteghi 1,3)
What say+you of the fun that we have had? During the last century, the grammar of Venitian has changed, so as to limit inversion to a verey restricted number of verbs for which the option in Paduan is still available. Hence, the inflected verb moves to C and an interrogative clitic appears on its right.

this is true, all inflected verbs have to move to C in Venetian direct questions too: so, what happens with verbs that do not belong to the restricted morphological class described above?

In Venetian normal interrogative sentences are construed as clefts:

(29) Cossa ze che el magna?
What is that he eats?
(30) Quando ze che el parte?
When is that he leaves?

It is interesting to note that clefts show the same asymmetry noted for inversion structures between main and embedded contexts:

(31) a. *Ghe go domandà cossa ze che el magna
Him (I) asked what is that he eats
b. *Ghe go domandà dove ze che el ze ndà
Him (I) asked where is that he is gone

Sentences like (31a) and b, in which the cleft structure is embedded, are ungrammatical. On the contrary (29) and (30) are the most natural way to ask a question.

This contrast between main and embedded interrogative structures suggests that the *wh*-criterion is once again at work in these structures: the spreading of a cleft structure exclusively in main interrogative sentences in Venetian must depend on the need tomove the inflected verb to C.

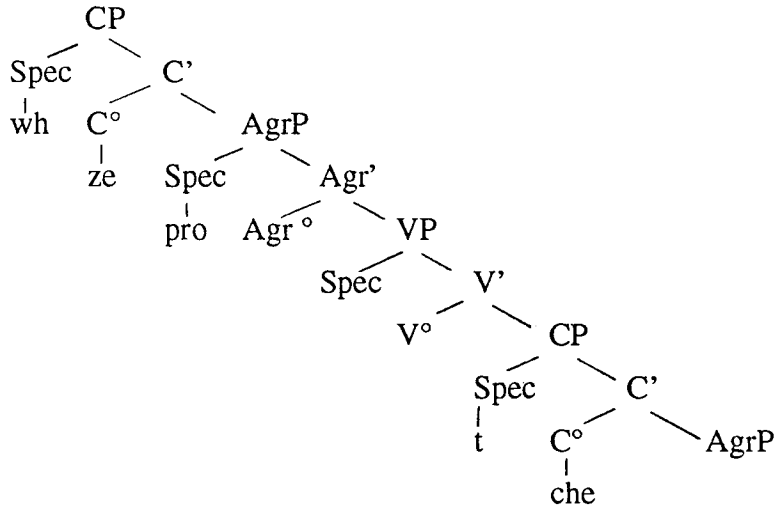
In order to explain why the movement of the inflected verb to C should require a cleft structure in Venetian, we have to take into consideration what the consequences of this movement are.

In section 2.1. it has been shown why Paduan needs an interrogative subject clitic series. When the verb moves to C, it destroys the context of Nominative case assignment, hence a subject NP is ungrammatical in the SpecAgr position. Moreover it destroys the context of *pro* identification. Hence, an argumental *pro* also is banned from that position. The only argumental subjects that can appear in such a structure are subject clitics, that start from SpecAgr, and incorporate onto the inflected verb in C, thus satisfying the visibility principle through incorporation. There is only another element that can remain in SpecAgr in Paduan: it is an expletive *pro* that does not need any identification, because it has no content to *be* recovered.

In Venetian the mechanism of inversion is not available because interrogative subject clitics are restricted to the morphological class specified above. Hence the only element that can occupy the SpecAgr position is an expletive null subject. A cleft structure exploits just this possibility. In a cleft sentence the inflected verb that moves to C is the copular verb be, and not the main verb:

(32) a. Cossa ze che la magna?

b.



In (32) the copula *ze* has moved to C, destroying the context of Nominative case assignment and of identification of an argumental *pro*. In the SpecAgr position of the copular clause there is a non argumental *pro* that does not need any identification, hence it is grammatical in the SpecAgr position.[11] The interrogative sentence is embedded under the copular structure. This prevents the inflected verb (magna in (32)) from moving to C, because, as in any embedded question, the C position is already filled by a [+wh] marked complementizer (namely *che*).

If the verb does not move, the context of Nominative case assignment and of pro identification is not destroyed: a *pro* or a subject NP can occupy the SpecAgr position of the embedded interrogative. In short: clefting is a way to embed the sentence avoiding the necessity of verb movement to C.

A cleft structure does not violate the *wh*-criterion, because an inflected verb, the copula, has been moved to C to satisfy the Spec-head condition for *wh*-items and *wh*-items. Clefting can satisfy the visibility principle too which requires a case for a phonetically realized subject NP, or identification features for an argumental subject *pro* because the inflected verb that assigns them through Spec-head agreement has not moved to C.

Both the *wh*-criterion and the *pro* identification require the same structural configuration, namely a Spec-head relation with the inflected verb. If there is only one inflected verb in the sentence, it will never satisfy both principles because it can be in a Spec-head configuration either with the *wh*-item or with the subject, never with both.

11 The subject in this structure is not a true expletive, but probably a quasi-argument as defined in Chomsky (1981).

Splitting the structure in a copular and in an embedded clause meets at the same time all requirements imposed by the *wh*-criterion and by the visibility principle because there are two inflected verbs, one in a Spec-head configuration with the *wh*-item, and the other with the subject.

If the strategy used in Venetian consists in the embedding of the question, it should not be surprising that another way to formulate a direct question parallels the structure of indirect interrogative sentences:

(33) Cossa che la magna?
What that she eats?
(34) Me domando cossa che la magna
Me (I) ask what that she eats

As noted in section 2.1, in Paduan (and Venetian too) the complementizer is always obligatory, even in interrogative sentences where a wh-item occupies the SpecC position. In (33) the complementizer che appears in the C position as in (34), hence direct questions are parasitic on the structure of indirect questions. Sentences like (33), in which C is filled by a complementizer, constitute the natural evolution of this system, that already exploits clefting as a way to embed the question. (33) is nota problem for the *wh*-criterion in itself, because the Spec-head configuration between a *wh*-head and the *wh*-item is met by the complementizer in C, which is compatible with the feature [+wh], as (34) shows. (33) poses a problem regarding the difference between Venetian on the one hand, and other languages as for instance, French and English on the other. Why is a sentence like (33) not possible in these languages too, as (35) shows?

(35) a. *What (that) she eats?
b. *Quoi (que) elle mange?

In the case of English and French one could assume that the complementizer *that* or *que* is not compatible with the feature [+wh].

Then (35a) and (35b) should be grammatical without the complementizer, but they are not. It seems that only Venetian can exploit the structure of an indirect question to render a direct one.

This difference can be quite easily captured assuming that only in Venetian is there a choice open about the selection of the head marked with the feature [+wh] in main questions: both Inflection or C can be marked [+wh] in a direct interrogative sentence.Expressing this observation through the means of a parameter that rules the choice of the [+wh] marked head in main questions, we obtain the following possibilities:[12]

12 Within the hypothesis adopted here, the head marked with the feature [+wh] can be Agr or T,

(36) a. Infl is marked [+wh]
b. C is marked [+wh]

A language like French or English, chooses (36a), hence the inflected verb must move to C in main interrogatives in order to be in a Spec-head relation with the *wh*-item.

Venetian has both opportunities open: if Inflection is marked [+wh], the inflected verb has to move to C. In this case a cleft structure is realized, in which the inflected verb that moves to C is the copula. If the verb is an a thematic verb, inversion applies (but a cleft is not excluded either). If C is marked [+wh], a complementizer occupies the head of CP, realizing a structure like (33) parallel to an embedded question. A parameter like (36) leaves a third possibility open: that of a language that chooses only C as the head marked [+wh]. In the next section we will see that Triestino is such a language.

Till now we have examined examples of questions; looking at *yes/no* questions in the perspective of the parameter in (36), we should expect to find the same possibilities that questions show, namely a cleft structure of the type *est-que* as in French, or a Complementizer expressed in C:

(37) *Ze che el vien qua?
Is that he comes here?
(38) *Che el vien qua?
That he comes here?

Both (37) and (38) are excluded in Venetian, even though they are perfectly comprehensible.[13] The normal way to ask a *yes/no* question is equivalent to an assertive sentence with a raising intonation:

(39) El vien qua?
He comes here?

This is completely unexpected under the *wh*-criterion and parameter (36): a sentence like (39) violates the Spec-head relation requirement, because neither the inflected verb nor the complementizer are marked [wh+]. The inflected verb remains in fact in its position, and does not show any inversion or clefting phenomenon. The

most probably T because it is semantically an operator.

13 In Fiorentino this possibility is realized:
(i) che tu vieni?
That you come?
(Are you coming?)

complementizer is not phonetically realized, hence it is not present at all in the structure, given that a [wh+] marked complementizer must be obligatorily realized in embedded questions. (cf. fn. 6.)

It is tempting to assume that in Venetian there is no null operator in yes/no question that triggers the necessity of a head marked [wh+], and this is the reason why the verb does not need to move to C, and no complementizer is realized in C. But, as L. Rizzi pointed out to me, this assumption would raise the question of how this structure can be interpreted as an interrogative at LF. If we are compelled to assume that there is a null operator even in sentences like (39), where no difference from an assertive sentence is visible, then the null operator in SpecC must be different from a phonetically realized *wh*-item because it is not submitted to the *wh*-criterion. In fact no head marked [wh+] is visible in C: the inflected verb does not move, no clefting is permitted, and no complementizer is realized in C.

We will leave the problem open, here, noting that the study of other languages may help us to choose between the two possibilities, namely to differentiate null operators from items or to assume that null operators can be absent in the structure of yes/no questions. However Venetian shows that *yes/no* questions are different from questions, hence we expect that this asymmetry would emerge in other languages too. In the next section we will examine Triestino, a dialect that makes the third possible choice regarding (36): only C is marked [wh+] in both main and embedded questions.

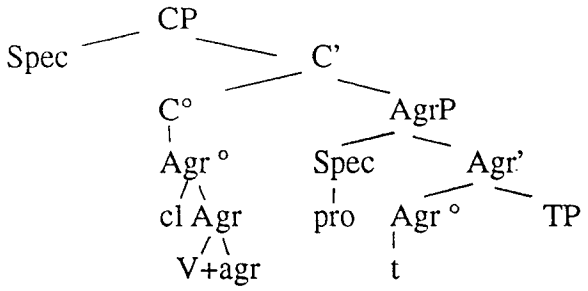
2.3 Triestino: A [wh+] C. Triestino is another dialect diacronically related to Venetian, spoken in the town of Trieste, which does not show any phenomenon of inversion between the inflected verb and a subject clitic at all:

(40) a. Cossa la dise?
what she says?
b. Dove la iera?
where she was?

On the basis of the discussion about Paduan and Venetian, we can formulate two hypotheses regarding the examples in (40a) and (40b). The first one is to admit that Infl is marked [+wh] in Triestino as in Paduan. Hence the inflected verb has to move to C, to be in a Spec-head configuration with the *wh*-item.

Given that the subject clitic appears on the left of the verb, Triestino will have structure (23b), (here repeated as (41)) which we excluded for Paduan:

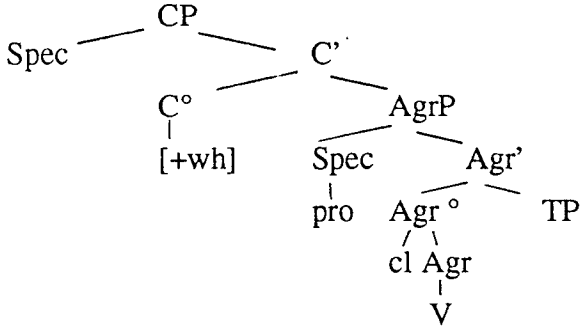
(41)



The contrast between (40) and the correspondent Paduan example (23a), which is ungrammatical, depends on the different conditions of identification of an argumental *pro* in Paduan and in Triestino. In (41) there is an argumental *pro* in SpecAgr, that needs to be identified by an element, which is in C: the clitic, when the person of the verb has one, or the inflected verb itself en there is no subject clitic (as for first person singular and plural and second person plural).

In Paduan (41) is excluded because government is not the right configuration for the transmission of the person and number features to the null pronominal subject in SpecAgr. If (41) is the correct structure for the sentences in (40), government must be a possible configuration of identification for a *pro* in Triestino. This amounts to saying that in this dialect the domain of identification of a *pro* does not coincide with the domain of Nominative case assignment. This hypothesis codes the difference between Triestino on the one side and Paduan and Venetian on the other as a consequence of different pro-drop conditions. A second hypothesis, which is compatible with the word order in (40), attributes the missing inversion in Triestino to the fact that the verb has not moved to C. In other words, we can imagine that Triestino constitutes the third case predicted by the parameter in (36), in which only C can be marked [+wh], hence the inflected verb never moves to C. If this is true, the sentences in (40) should have the structure (42):

(42)



In (42) the inflected verb does not move to C, because it is not marked [+wh] by the language, which chooses C as the [+wh] marked head, as in embedded contexts. The *wh*-criterion is satisfied only by the movement of the item to SpecC,

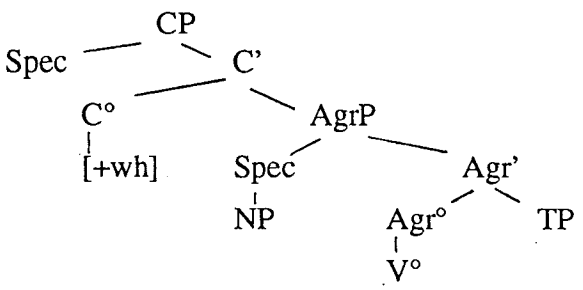
because the Spec-head relation is established with the head C, and not with the inflected verb.

Inversion or clefting are not present in Triestino, because they are not necessary: the context of Nominative case assignment and of identification of an argumental pros are preserved by the Spec-head agreement relation between the inflected verb and its Specifier. [14]

We are now faced with two possible explanations of the examples in (40), which both appear to be plausible.

The choice between the two solutions is thus an empirical question, because both structures (41) and (42) generate the correct string of words of example (40). There is a simple way to test which the correct structure for Triestino is: if the inflect verb has not moved to C, the SpecAgr position can be filled by a subject NP, generating the string *wh*-item - subject NP - inflected verb as in structure (43):

(43)



On the contrary, if the verb has moved to C the string *wh*-item - subject NP-inflected verb should be impossible, because there would be no position available to the subject NP between the in SpecC and the inflected verb in C.[15] At this point, we have a way to discriminate between the two solutions represented by (41) and (42): if the correct structure is (41), the sequence *wh*-item - subject NP - verb must be ungrammatical. If the correct structure is (42), the sequence *wh*-item - subject NP - verb must be possible:

(44) Cossa la mama dise?
what the mummy says?

14 In Triestino a complementizer is not obligatory in embedded interrogatives , as is the case with Paduan and Venetian:
(i) No so dove la va
Therefore, it is not surprising that it is not realized in main interrogatives even if C is marked [+wh].

15 (44) cannto be considered a case of Complex Inversion because there is no subject clitic at the right of the inflected verb.

The fact that (44) is grammatical shows that (42) is the correct structure for Triestino. Hence, the inflected verb does not move to C. Given that Triestino must be submitted to the *wh*-criterion as any other language, there must be a head marked with the feature [+wh], which is in a Spec-head configuration with the *wh*-item. (44) proves that this head is not Infl. Therefore, it must be C, as in embedded clauses.

A sentence like (44) is possible in Triestino, but it is ungrammatical in Standard Italian, and in Paduan (respectively (45a) and (45b):

(45) a. *Cosa la mamma dice?
b. *Cossa la mama dise?

The contrast between (44) and (45) reinforces our claim about the existence of a parameter which has to be expressed in terms of a choice regarding the head that is marked with the feature [+wh]. Infact, the difference between (44) and (45) is captured by parameter (36): in Standard Italian and in Paduan the inflected verb is marked [+wh], and it has to move to C. Hence the ungrammaticality of a sequence like (45). In Triestino C is marked [+wh],the inflected verb stays in its position in Agr, then the sequence *wh*-item - subject NP - verb is grammatical.

It is interesting to note how Triestino has developed through a stage similar to Venetian during the first half of the last century: in written Triestino of this period it is possible to find examples as (46b), parallel to the actual Venetian example (28a), here repeated as (a):

(46) a. Cossa falo?
what does+he
b. Cossa gala? (Doria (1978) p.116)
what has she?

The three dialects here examined constitute then three stages of the same evolutional tendency: Paduan is the most conservative one, with obligatory inversion in all direct questions. Venetian is the intermediate stage, in which inversion is morphologically restricted, cleft structure being the most current form for questions, but direct questions with the structure of indirect questions are possible too. Triestino is the final stage, in which no inversion can be found, and the head marked [+wh] is C.

If we consider the movement of the verb to C in direct questions as a residual verb second phenomenon, as Rizzi (1990) does, then we have to state that Northern Italian Dialects are eliminating the last verb second context through the change of a parametric choice from (36a) to (36a).

The research on inversion in Northern Italian Dialects is by no means exhausted by at we have been discussing here. More extensive work is needed especially with regard to the varieties which are losing inversion in order to check ether they pattern with Triestino, and if parameter (36) correctly describes the distributional variation.

3. Cases of missing inversion

In this section we will examine four cases of missing inversion in Paduan. Our theory predicts that inversion is obligatory in this dialect, because the inflected verb is the head marked [+wh] and must move to C in order to be in a Spec-head configuration with the item. The cases in which inversion does not apply are particularly interesting, because they pose potential problems to the analysis proposed in section 2.1. We will try to reduce these apparent exceptions to other intervening factors that block the movement of the inflected verb to C and/or inversion.

3.1 Interrogation of the subject. In section 2.1 no example has been given of subject interrogation. Subject interrogation in Paduan has a quite complicated distribution that deserves closer examination. It is exceptional with respect to interrogation of other elements, because no inversion can take place in the sentence:

(47) a. *Chi vienlo
o comes+he ?
b. Chi vien?
o comes?
c. Vienlo?
Comes+he?

Example (47a) is excluded because a subject clitic appears on the right of the inflected verb. In fact, if no interrogative subject clitic is present, the sentence is grammatical, as (47b) shows. The contrast between (47a) and (47b)-(47c) could be interpreted as evidence that the inflected verb does not move to C, when the item corresponds to the subject. This hypothesis entails that there is a one to one correspondence between movement to C and inversion. This may not be true; the ungrammaticality of (47a) may be due to the fact that the inversion phenomenon itself is blocked by some other factor.

There is in fact quite a simple way to exclude (47a) without recourse to a violation of the *wh*-criterion, or to any ad hoc assumption. In section 2.1 it has been shown on the basis of example as (48) that, interrogative subject clitics are arguments because they absorb a theta role:

(48) a. *Vienlo qualchedun?
comes+cl somebody?
b. Vien qualchedun?
Comes somebody?

In (48a) the cooccurrence of a subject clitic with a subject NP is impossible, because they compete for the same thematic role. In example (47a) the subject leaves a variable trace in the basic position of the subject. This trace absorbs the theta role of the subject which the subject clitic needs too. The impossibility of (47a) can thus be attributed to a violation of the theta criterion because there are two thematic subjects that compete for the same theta role.

We do not need to assume that (47) constitutes a counterexample to the *wh*-criterion, because inversion is not possible. The occurrence of an interrogative subject clitic is already excluded by the theta-criterion, hence only a sentence like (47b) can be grammatical, in which the inflected verb moves to C, but no subject clitic appears on its right. Hence, missing inversion does not mean necessarily that the inflected verb has not moved to C.

Our hypothesis assumes that (47a) has to be excluded on a par with (48a), tracing back the ungrammaticality of both examples to the fact that in Paduan subject clitics are arguments, and as such they need a thematic role. This is confirmed by the fact that no subject clitic appears in expletive and quasi-argumental contexts, where the subject does not get any argumental theta role assigned:

(49) a. *Piovelo?
Rains+cl?
b. Prove?
Rains?

If our reasoning is correct, these three contexts, exemplified in (47), (48) and (49) must always go together: if a subject clitic is grammatical in one of these three contexts, it must also be permitted in the other two. The prediction is that, if in some dialect (47a) is a possible sentence, then (48a) and (49a) must be grammatical too.

Such a dialect exists. It is Bellunese, spoken in a northern area of the same region, Veneto. In Bellunese a subject clitic appears in all the three contexts considered here:[16]

(50) a. Chi magnelo qua?
who eats+he here?
b. Vegnelo qualchidun?
Comes+he somebody?
c. Piovelo?
Rains+cl?

16 We will refer to this variety as to Bellunese, because the dialect of the town of Belluno has been used for the examples.The area in which the phenomenon of in situ has been observed is a larger one, and it includes all the varieties spoken around the town of Belluno.

In Bellunese subject clitics are not sensitive to the presence of a subject theta-role: they do not need it and do not absorb it, if it is present. Hence they can cooccur with a thematic subject as the variable subject in (50a), the quantifier in (50b), or appear when no argumental theta-role is assigned to the subject as in (50c).

As for the reason why the subject clitic in (50) is obligatory, we leave the question open, noting that this fact could be connected with the licensing of an expletive null subject in this variety. Bellunese minimally differs from Paduan and Venetian because it needs a subject clitic also for the licensing of an expletive *pro* in SpecAgr.

We can conclude that a distinction between argumental subject clitics and expletive subject clitics, in the sense that they absorb a theta-role or not, is correct. The ungrammaticality of inversion in Paduan main interrogatives on the subject is not to be attributed to a violation of the *wh*-criterion but to the argumental nature of subject clitics in this dialect.

The distribution of *wh*-subjects in Paduan is even more complicated than in (47), because a direct interrogation of the subject is possible only with ergative verbs, as in (47b), in which the verb venire (to come) has been used. As (51) shows, a subject of an unergative verb cannot be directly extracted:

(51) a. *Chi ga un corteo?
who has a knife?
b. Chi ze che ga un corteo?
who is that has a knife?

This asymmetry does not exist in Standard Italian, in which every subject can be directly extracted, hence there must be some parametric choice regarding the subject involved in these structures. The difference between Standard Italian and the dialect under consideration may be captured on the basis of a parameter regarding the way the case is assigned to the postverbal subject position, which, according to Rizzi (1982), is the extraction position of a subject (cf. Poletto in preparation).

In Paduan, the grammatical sentence corresponding to (51a) is a cleft, as in (51b). In the light of the discussion about clefting in Venetian, (51b) can be considered as a means not to move the inflected verb to C. Recall that this movement destroys the Nominative case assignment context which is needed by the variable left by the moved to SpecC.

Hence (51a) is ungrammatical because the subject variable trace does not receive Nominative case assigned. The cleft structure allows the inflected verb to remain in its position, and to assign case to the trace of the subject; at the same time the *wh*-criterion is not violated, because there is a [+wh] marked inflected verb, namely the copula, in a Spec-head configuration with the *wh*-item.

What about (47b)? If the context of Nominative case assignment is destroyed by the movement of the inflected verb from Agr to C in the case of transitive and intransitive verbs, why is the structure correct with ergative verbs?

According to Belletti (1988), the class of ergative verbs, syntactically defined in Burzio (1986), assigns partitive case to its subject which is structurally a deep object. The asymmetry between ergative vs. unergative verbs can be described in these terms: ergative verbs have two possibilities to assign case to their subject: Spec-head agreement with the head of AgrP, and partitive case assigned directly by the verb in the deep structure subject position.[17] Unergative verbs only assign case through Spec-head agreement with the head of AgrP.

When the context of Nominative case assignment through Spec-head agreement between Agr and SpecAgr is destroyed by the movement of the inflected verb to C, the variable trace of the subject cannot get a case assigned from unergative verbs, hence the structure is filtered out. On the contrary ergative verbs can assign case to the variable trace of the subject , and direct questioning of the subject is possible. Direct movement of a subject to SpecC, which triggers movement of the inflected verb to C, is permitted only when another case, which is not Nominative through Spec-head agreement, is available. Only ergative verbs have this option, hence the contrast between (47b) and (51a).

It is interesting to note that this asymmetry surfaces only in Paduan, and not in Bellunese, which has expletive interrogative subject clitics:

(52) a. Chi vegnelo?
who comes +he?
b. Chi magnelo qua?
who est+he here?

It seems that the expletive subject clitic that appears on the right of the inflected verb enters somehow into the Nominative case assignment process to the trace of the subject. The subject clitic is rendered visible through incorporation, and it is coindexed with the subject variable: in Bellunese contributes to render the subject NP visible. The chain established through coindexing between the variable and the subject clitic is sufficient for the variable trace to be visible too, even though it does not get Nominative case assigned through Spec-head agreement. (see Dobrovie Sorin (1990) for a recent discussion) In Paduan a chain between the subject clitic and the variable trace, as in the one of Bellunese, is not possible, because they are both arguments and they both absorb the subject theta-role. This is the reason why in Paduan the deep asymmetry between the case assignment conditions to ergative vs. unergative subjects comes to light, while it does not emerge in Bellunese.

17 The case assigned to the ergative subject in its basic position could be Nominative case too. There is evidence that in some languages, as, for instance, German, ergative subjects are marked with Nominative even if they are inside the VP.

3.2 Wh-items in situ. In this section we will examine a case first noted in the literature by Benincà and Vanelli (1982) of *wh*-items *in situ* in a variety of Veneto introduced in the preceding section as Bellunese. The distribution of *wh*-items *in situ* seems to represent a counterexample to the *wh*-criterion:

(53) a. Alo fat che?
Has+he done what?
b. *Alo fat cossa?
Has+he done what?
c. Cossa alo fat?
what has+he done?

In (53a) inversion applies even if the *wh*-item has remained in its argumental position, hence the Spec-head relation condition between the head marked [+wh] and the *wh*-item is not respected. Examining the *wh*-items that can remain in *situ*, we find that the phenomenon is restricted: only some *wh*-items can remain in situ. In (53a) the *wh*-item *che* ("what") remains in its basic object position. In (53b) the cossa which means what too cannot remain in situ, it has to move to SpecC as in (53c).

Furthermore, the phenomenon is restricted to direct interrogative sentences:

(54) a.Valo ndond?
Goes+he ere?
b. *Me domando che el va ndond
(I) ask me that he goes ere
c. Me domando ndond che el va
(I) ask me ere that he goes

Only (54a) is grammatical, in which the verb has moved to C triggering inversion of the subject clitic. In embedded contexts the *wh*-item has to move to SpecC, as (54b) and (54c) show.

The possibility of leaving a *wh*-item *in situ* seems thus related to inversion, hence to the movement of the inflected verb to C. If the *wh*-criterion were simply not valid in this dialect we would not expect to find any asymmetry between main and embedded contexts, on the contrary the *wh-item* should appear *in situ* in embedded questions too.

This fact can give us a clue to solve the problem we are faced with. A tentative solution to bring these data inside the frame adopted here, could be the assumption that this dialect has a null operator in SpecC, which is licenced by the presence of the inflected verb in C. As Rizzi (1990) observes, the *wh*-item is not considered as an operator until it moves from its argumental position. Hence in (54a), the operator is not the wh-word ndond, but the null operator is SpecC, which is in a configuration of Spec-head agreement with the inflected verb marked [+wh]. The wh-criterion is thus respected in Bellunese too.

As for the reason why only the inflected verb can licence a null operator while the [+wh] marked complementizer in C cannot, we do not have any conclusive proposal. It can only be noted that this fact must be connected with the way in which the head is marked [+wh], hence with the distinction of [+wh] marking through selection and [+wh] marking through the choice given by a parameter as (36).

It is interesting to note that the asymmetry between ergative and unergative subjects noted in Paduan emerges in this dialect too, even though in a different context. In Bellunese unergative wh-subjects have to move to SpecC, while ergative subjects can behave as objects and remain in situ (cfr. Benincà and Vanelli (1984)):

(55) a. Elo vegnest chi?
Has+he come who?
b. *Alo magnà chi?
Has+he eaten who
c. Chi alo magnà?
who has+he eaten?

The distribution in (55) can be explained as a reflection of the same problem of Nominative case assignment mentioned in the preceding section to explain thePaduan data. The ergative subject in (55a) gets Partitive case assigned directly by the verb in its structural deep object position, and does not need to move. The unergative subject in (55c) must move to SpecC in order to form a chain with the interrogative subject clitic and satisfy the visibility condition through this chain, as no Partitive case can be assigned to the subject of a transitive or intransitive verb.

Bellunese does not represent a counterexample to the theory. On the contrary, it shows that the distribution of the wh-item in situ obeys the general principles of the grammar.

3.3 Per-ché. Another puzzling case of missing inversion is evident in (56):

(56) a. Parché Carlo el sta casa?
why Carlo cl. stays at home?
b. *Parché stalo casa?
why stays+he at home?

The ungrammaticality of inversion in (56) can be interpreted as deriving from a condition on inversion itself, as it was the case of subjects in section 3.1, or it can be a true violation of the requirement to move the inflected verb to C.

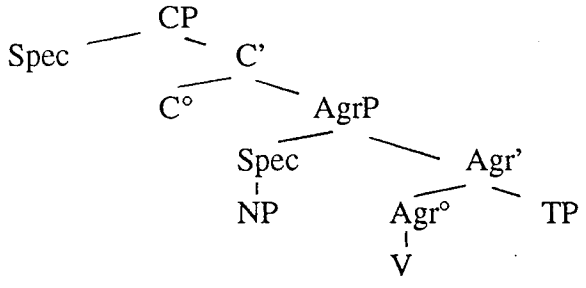
A test to prove if the verb has moved to C has been mentioned in section 2.3 for Triestino. It regards the possibility of realizing a subject NP directly after the wh-item. If the inflected verb moves to C the Nominative cannot be assigned to SpecAgr and a subject NP in that position is ungrammatical. If the inflected verb

remains in its position, the Nominative is available in SpecAgr, and a subject NP is grammatical.

(57) Parché Nane ze stà casa?
why John is stayed (at) home?

(57) shows that a subject NP can intervene between the *wh*-item *parché* and the inflected verb. Hence the structure of the sentence must be (58) in which the verb has not moved to C:

(58)



(57) shows then that (56) is a true violation of the *wh*-criterion, because the inflected verb is not in a Spec-head configuration with the *wh*-item *parché.*

In Paduan there exists another word for why, which is parcossa. This item, on the contrary to parché behaves completely regularly with respect to the *wh*-criterion, because it triggers inversion in main interrogatives, and it is followed by a complementizer in embedded questions:

(59) a. Parcossa zelo stà casa?
why has+he stayed home?
b. *Parcossa el ze sta casa?
why he has stayed home?
(60) No so parcossa che el ze stà casa
(I) not know why that he has stayed home

The problem noted with regard to (56) seems to depend by some idiosyncratic property of the word parché in itself, because another item with exactly the same meaning regularly triggers inversion in main questions.

Parché behaves exceptionally not only with regard to inversion, but also in embedded interrogatives:

(61) a. No so parché el ze sta casa
(I) not know why he has stayed home
b. *No so parché che elze sta casa
(I) not know wny that he has stayed home

When *parché* is present the embedded question cannot be introduced by a complementizer che, as the contrast between (61a) and (61b) shows. As mentioned in section 2.1, a complementizer is always obligatory in Paduan embedded questions, with all *wh*-items. Infact, if the complementizer is omitted all the sentences in (62) are excluded:

(62) a. No so chi *(che) ga magnà qua
(I) not know who (that) has eaten here
b. No so quando *(che) te si vegnuo
(I) not know when (that) you have come
c. No so parcossa *(che) el ze sta casa
(I) not know why (that) he has stayed home

The contrast between (61) and (62) parallels the contrast between (56) and (59), here repeated as (63):

(63) a. Parché el sta casa?
why he stays at home?
b. *Parché stalo casa?
why stays+he at home?
c. Parcossa zelo stà casa?
why has+he stayed home?
d. *Parcossa el ze sta casa?
why he has stayed home?

Hence parché is exceptional both in main and in embedded contexts. This idiosyncratic feature must depend on the word *parché* itself. Looking at its internal form, we find that it consists of a preposition par (for) and of a complementizer che (that). If we make the hypothesis that the speakers analyze it as a preposition plus a complementizer, the exceptional behaviour of parché follows as a consequence.

If parché constitutes the coalescense of a preposition and a complementizer, and they are both analyzed as such in the syntax, then both positions of the CP projection are occupied: the SpecC position by the preposition and the C position by the complementizer. (cfr. Kayne (1989) and Benucci (1990) that analyze prepositions as SpecC elements) If C is already occupied, no other item can fill the position: the inflected verb cannot move to C, and a complementizer cannot appear after parché. On the contrary parcossa does not contain any complementizer (the word cossa corresponds to what, not to that), hence the C position can be filled by something else: the inflected verb in main interrogatives and the complementizer in embedded ones. *Parché* is thus a special case of *wh*-item, because it is able to saturate the entire CP projection, and it vacuously satisfies the wh-criterion: the head *che* and a item par are in a Spec-head configuration at the CP level.

3.4. Negative interrogatives. The last case of missing inversion is that of negative interrogatives (cfr. Benincà and Vanelli (1984)):

(64) a.Vienlo?
Comes+he?
b. *No vienlo?
Not comes+he?
c. Nol vien?
Not+he comes?

Inversion is impossible if a negative marker appears in front of the verb as in (64b) in the varieties that show only a preverbal negative marker. The grammatical structure corresponds to a normal assertive sentence (with a raising intonative pattern), as in (64c). This blocking effect with respect to inversion is restricted by the type of negative marker that is present in the sentence.

The way to express negation in Paduan varieties has quite a complicated distribution: three types of dialects can be isolated for the present discussion. A first type, which has only a preverbal negative marker (no), a second one ich presents a situation similar to Standard French, with a preverbal and a postverbal negative marker corresponding to *ne...pas* (*ne...mina*), and a third type, which has only a postverbal negative marker (mina).

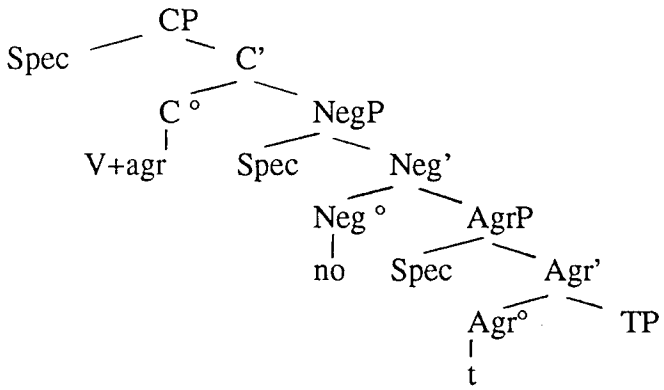
Only a preverbal negative marker can block inversion. Infact a negative question with inversion is grammatical in a variety which has only a postverbal negative element as examples (65a) and (65b) show:

(65) a. Vienlo?
Comes+he
b. Vienlo mina?
Comes+he not
c. Ne vienlo mina?
Not comes+he not?

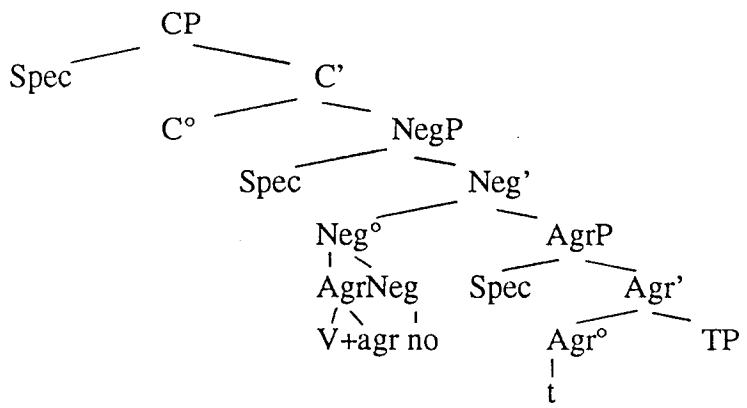
We can thus approximately describe the relevant property for the capacity to block inversionas the preverbal status of the negative marker. This is not enough, as can be seen from the data of the varieties ich have both a postverbal and a preverbal negative marker as in (65c). Given that (65c) is grammatical, in which a preverbal and postverbal negative marker are present and inversion has been applied, we must assume that only a preverbal negative marker, which is the only negative element of the sentence, has the capacity to block inversion. Hence there are two properties relevant for the case under discussion: the preverbal status and the "loneliness" of the negative element.

We are now faced with two distinct problems. The first one regards the blocking effect of negation itself. Why does it take place, and how? At first sight it seems tempting to assimilate the blocking effect of the negative marker to the well-known case of minimality between heads.(cfr. Baker (1988)). The inflected verb must move from the head Agr to the head C, in order to satisfy the *wh*-criterion. Suppose that the negative head is placed betweenAgr and C, (as recently proposed in Zanuttini (1989)) then the inflected verb has to pass through this head in order to reach C. If the inflected verb "jumps" over the negative head, as in (66a), this will constitute a closer governor for the trace of the verb, thus preventing the correct reconstruction of the movement. But even if the verb passes through the negative head the resulting structure is not grammatical, because the verb must adjoin to the left of negation, as in (66b):

(66) a.



b.



At this pont, the head that moves to C is not more Agr, marked [+wh], but Neg which does not have any *wh*-feature at all. Hence the *wh*-criterion is violated, because there is no Spec-head relation between the *wh*-item and the head marked [+wh], ich is not visible in C because it is "covered" by Neg.

The negative projectionin any case blocks the movement of the inflected verb to C, no matter whether it skips over the negative head or whether it passes through it. If this analysis is tenable, we have to admit that only the dialects that mark the

negative projection with a preverbal negative marker project NegP between Agr and C. The other dialects, which have a postverbal or a preverbal and a postverbal negative marker, project it in a lower position inside the hierarchy of the functional heads.

It is possible to imagine other ways to prevent the movement of the inflected verb to C when a preverbal negative marker is present. A particularly promising solution appears to be the one developed in a recent work by Tomaselli (1990) on clitics in Old High German. Tomaselli proposes that a clitic adjoined to the head of Agr prevents the Spec-head relation between the *wh*-item in SpecC and the inflected verb, because it intervenes between the two. It is the more proximate head to the item, but it is not marked [+wh]. Hence the *wh*-criterion is violated. The intuition behind this is that the clitic, in this case the preverbal negative marker, has a minimality effect because it is the first accessible head to the *wh*-item and it is not marked [+wh].[18]

I will not adopt a definite solution here because the degree of variation in the dialects is so great that it deserves an intensive study on its own before we can formulate an adequate generalization.

Let's turn to the second problem raised bythe contrast between (64b) and (64c):

(64) b *No vienlo?
Not comes+he?
c. Nol vien?
Not+he comes?

If inversion does not apply, does the inflected verb move to C or not? If it does not, how is the *wh*-criterion satisfied?

In the case of negative interrogatives we do not have any reason to assume that inversion is excluded on its own by some independent principle, as was the case of subject interrogation in 3.1. Hence the equivalence missing inversion - no movement of the inflected verb to C is still valid.If the verb does not move to C, the *wh*-criterion is violated. Let's take into consideration cases of negative interrogatives with *wh*-items:

18 This hypothesis entails thattwo types of clitics have to be distinguished on the basis of the level of adjunction. Object clitics for instance must adjoin to a level which is low enough not to be visible to the *wh*-item. Hence they can appear at the left of the verb on C as in (i):

(i) Quando lo gheto visto?
when him have+you seen?
(when did you see him?)

On the contrary subject clitics and the preverbal negative marker areadjoined to a higher level and produce the minimality effect that prevents the Spec-head relation between the wh-item and the inflected verb marked [wh+].

(67) *Cossa no galo fato?
what not has+he done?

Wh-questions behave parallel to yes/no questions with respect to inversion. As expected, (67), in which inversion applies, is ungrammatical. But *wh*-questions are ungrammatical even if inversion does not apply:

(68) * Cossa nol ga magnà?
what not+he has eaten?

(68) is possible only as an echo question, with a perceptible pause after the item. The normal way to express a negative question is once again a cleft structure:

(69) Cossa ze che nol ga magnà?
what is that not+he has eaten?

As discussed in the previous sections, clefting is an escape strategy in order to avoid a violation of the *wh*-criterion and at the same time not moving the verb. *Wh*-negative questions do not presentthus any violation of the *wh*-criterion. A sentence like (68), in which the verb does not move to C, is excluded as the theory predicts. On the contrary, in *yes/no* questions the verb does not move to C, no cleft structure is used, and the sentences are good all the same, as (64c) shows:

(64) c. Nol vien?
Not+he comes?

The constrast between (68) and (64c) shows that there is an asymmetry between yes/no questions and wh-questions. In section 2.2, the case of Venetian has been presented, in which yes/no questions clearly diverge from wh-questions. We noted this fact leaving the problem of its syntactic aspect open.

Negative questions constitute another context in ich *yes/no* questions diverge from wh-questions. Hence, Venetian is not an idiosincratic dialect, with some particular device in its grammar that permits a violation of the *wh*-criterion only in *yes/no* questions.

What is the primitive property behind this asymmetry? It seems that yes/no questions can violate the *wh*-criterion, if there is some conflict with another principle, while *wh*-questions can never do that. In section 2.2 we suggested two possible ways to solve the problem: *yes/no* questions do not need any operator in SpecC, or the operator of *yes/no* questions can use a different type of operator if this is necessary, while *wh*-questions are compelled to be interpreted on the basis of the *wh*-criterion. The intuition behind both proposals is that *wh*-items are overt, and as such cannot escape to the *wh*-criterion, while null operators are phonetically empty and as such can be interpreted as a kind of element not submitted to the *wh*-criterion.

We know that there are operators that are not submitted to the *wh*-criterion in the grammar, for instance operators of topicalized structures. It would not be surprising to discover that null operators of *yes/no* questions are more similar to topicalization operators than to true *wh*-operators, at least in Italian. (cfr. Cinque (1990) and Guasti andPoletto (1990)). This argument deserves a deeper analysis that lies beyond the scope of this work.

4. Conclusion

The present work constitutes a brief example of how interesting a comparative analysis of different, very closely related, languages can be for the study of the grammar in general and syntax in particular. In the light of a new theory about interrogative structures presented in Rizzi (1990), we have examined three dialects which share the same properties with respect to subject clitics in assertive contexts. It has been shown that they differ in the way a main interrogative sentence is expressed, and that this distinction can be captured postulating the existence of a parameter that rules the choice of the head marked with the feature[+wh].

In the second part of the work some apparent cases of violation of the theory have been examined. For the most part they can be reduced to the interference of other general principles of the grammar, as the theta-criterion in the case of subjects, or minimality in the case of negation. A lot of problems remain open for further research and investigation, as, for instance, the precise characterization of null operators in yes/no questions and in situ structures. Nevertheless, it has been shown that it is possible to interpret the great distributional variation of different languages as being the result of a small number of assumptions regarding universal grammar and parametric choices.

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Pre-nominal Modifiers, Degree Phrases and the Structure of AP

Roberto Zamparelli
University of Rochester
roberto@psych.rochester.edu

1. Introduction. Pre-nominal adjectives in Romance can be divided in two classes, exemplified in (1) and (2) for Italian. The clearest distinction between the two is pragmatic: adjective of the first class are interpreted *non-restrictively*, adjectives in the second class, *restrictively*.

(1) Questa {dorata /estesa /bella /popolosa } regione della Francia
This {golden /large /beautiful /popolous } region of France
(2) La {frequente /vera /finta /completa /sicura} distruzione dei documenti.
The {frequent /true /fake /complete /sure} distruction of_the documents

Apart from this, other semantic and syntactic differences set apart the two classes. Elsewhere (Zamparelli, 1993a, 1993b), I have argued that this difference is due to the fact that the adjectives in (1) and (2) occupy different syntactic positions. Assuming a DP structure with N movement and a certain number of functional projections between DP and NP (Cinque, 1992, Crisma, 1991), the adjectives in (2) are heads of an adjectival maximal projection that takes an NP as its object, while adjectives in (1) have moved from the specifier of a lower maximal projection to a position outside the domain of the noun at SS.

In this paper, I will be primarily concerned with adjectives of class (1), that I will shall call *Appositive Adjectives*, or **App-Adj** for short. I will briefly consider the second class, *Restrictive Adjectives* or **Res-Adj** in section 2.

Pre-nominal appositive adjectives are subject to various peculiar restrictions, noted in part in Giorgi&Longobardi (1991). Their very existence, in a framework which adopts N-movement and some version of a principle of economy, is unexpected. I will show that, once we accept the existence of two types of pre-N adjectives, the class of adjectives that can be App-Adj can be straightforwardly defined, and that most of their peculiar behaviour falls from their internal structure, which I will investigate in detail in section 5.

Extending Diesing (1992), I will propose that, like IP, also DP contains a *nuclear scope* within which an empty quantificational head receives a 'degree' interpretation, and that adjective phrases may move prenominally to avoid 'existential closure' in the domain of the noun.

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2. The problem of pre-nominal adjectives in Romance. In Italian, as in most Romance languages, the canonical position for adjectives is post-nominal, between the noun and its complement. This was interpreted by Cinque (1992) as a derived sequence from an underlying [Adj Noun Complement] order, with N raising to receive agreement from one or more intermediate functional projections. It was originally thought that all adjectives (except maybe for cardinal adjectives, possessive and few other cases, like "certain") could be accomodated within the specifiers of NP and of the various agreement projections. However, this idea predicts that Romance languages should allow one pre-N adjective (the one in the specifier of the higher agreement projection to which N moves) and perhaps as many post-nominal adjectives as there are free specifiers below N at SS. The facts are unfortunately more complex. (3-4) show that up to three adjectives can precede N; (4b,c) show that in some cases the adjective ordering is fixed; (5) shows a noun phrase with five adjectives, three post-nominal, among which "possibile" *possible*, that was obligatorily initial in (4).

(3) Questo odioso falso gentiluomo
This hateful false gentleman

(4) a. Le possibili frequenti brutali invasioni di Giove
The possible frequent brutal invasions of Jupiter
b. * Le brutali frequenti possibili invasioni di Giove
* The brutal frequent possible invasions of Jupiter
c. * Le frequenti brutali possibili invasioni di Giove
* The frequent brutal possible invasions of Jupiter

(5) L'unica vera cucina vegetariana francese possibile in queste regioni
The only true cousine vegetarian French possible in these regions

Let's focus on (3). Both "odioso" and "falso" can also appear post-nominally. Since it seems unlikely that N movement, which is agreement driven, can fall short of raising all the way in some cases (those in which some adjectives remain pre-nominal), we are forced to conclude that either the same adjective can be generated in a higher or a lower position, or (3) is the result of adjective raising as well as noun movement. The first option is theoretically undesirable, since it would complicate a syntactic account of the rigid ordering of pre-N adjectives in (4). The second option, on the other hand, has problems explaining the motivations for adjective movement, which cannot be agreement-driven.

2.1. Two classes of Pre-N adjectives. If we consider carefully the pragmatic role played by "odioso" and "falso" in (3), we see that it is very different. "Falso"

radically changes the denotation of the noun phrases: from the set of 'gentlemen' to the set of individuals that are *not* gentlemen but, perhaps, look like one. On the other hand, "odioso" doesn't play any role in restricting the set of individuals the noun phrase refers to. It could be paraphrased by a non-restrictive relative clause: "Questo falso gentiluomo, che è anche odioso" (*this false gentleman, who is also hateful*). Were 'hateful' meant to be a distinctive feature of the man, and not merely a remark about the speaker's attitude, it would have gone post-nominally.

It appears, then, that appositive adjectives like "odioso" in pre-nominal position do not contribute in restricting the denotation of the object the noun phrase refers to, and are felicitous only to the extent their meaning is in some sense 'redundant' and not suitable to be used to identify a referent.[1]

It follows from this that adjectives expressiong properties stereotypically associated with the head noun are best in pre-N position (6).

(6) a. Il rosso sangue
The red blood
b. La bianca neve
The white snow
c. Il vasto universo
The vast universe

The same is true for stereotypical *degrees* of a property. This can be illustrated by an example. Ants come in different sizes. As ants go, there are big, relatively heavy ants and small, light ants. In Italian, however, the word "grande" *big*, and "pesante" *heavy*, which are commonly found in pre-N position, give a slightly odd result in this case.

(7) a. ? La {grande / pesante} formica
The {big / heavy} ant
b. La formica {grande / pesante}
The ant {big / heavy}

(7a), a funny-sounding phrase, seems to suggest that the ant has been prodigiously magnified, while (7b) clearly refers to an ant that is big or heavy *with*

[1]In must be mentioned in this conjunction that Romance languages differ widely in the acceptability of non-restrictive pre-N adjectives, and that Italian, from which most of the examples are taken is possibly the most liberal. Pre-nominal adjectives are often judged old-fashioned, bookish or stilted; however, this might be due to the pragmatic aspect of non-restrictivity associated with them. Appositive adjectives do not add any new information to the noun, and it is conceivable that in some languages their decline has followed the general decline of the rethorical—oratorial style of discourse, that used them profusely.

respect to the average ant size. (7a) would be felicitous—if redundant—with "ant" replaced by "elephant", or any animal of a stereotypically large size.

Pre-N appositive adjectives are best when the noun is maximally specified on independent grounds, either by being a proper name (8a), by having a modifier (the more definite, the better) (8b), or by being associated with a demonstrative (8c). Specificity of the noun favors a non-restrictive interpretation for the adjective.

(8) a. Il prode Garibaldi
The brave Garibaldi
b. La nera bandiera che penzolava dalla sua finestra
The black flag hanging from her window
c. Queste pigre giornate
These lazy days

None of these observations holds for the restrictive adjectives in (2). No modifier or demonstrative is required in noun phrases containing them. In addition, only Res-Adj can receive contrastive focus pre-nominally (9), only Res-Adj can go pre-nominally in 'A-generic' constructions (constructions in which a generic property is predicated of an indefinite noun phrase denoting a representative item of its class, see Carlson (1977)) (10), or appear with indefinites in the antecedent of "donkey-sentence" conditionals (Heim, 1982).

(9) Non voglio questa catapecchia, voglio una {VERA /BELLA /*ROSSA
I don't want this shed, I want a {real /pretty / red
/??AMPIA / *ISOLATA /??MINUSCOLA } CASA!
/large / isolated /tiny } house!

(10) a. Una {vera /bella /*isolata /??rossa} casa e' facile da fotografare
A {real /pretty /*isolated /??red} house is easy to photograph
b. Una vera domanda deve avere una risposta possibile
A real question must have a possible answer
c. Un frequente massaggio puo' eliminare lo stress
A frequent massage can wipe away stress
d. Un buon dottore deve sapere come trattare i bambini
A good doctor knows how to deal with kids

(11) Se un allevatore ha un {vero /bel /??grigio /??forte} purosangue,
If a horse-breeder owns a {real /pretty /??grey /??strong} pure-bred,
non lo batte.
he doesn't beat it.

2.2. The Ordering of pre-N Adjectives. Many Res-Adj have adverbial counterparts. Pursuing the idea of a strict parallel between adjectives and adverbs, we expect the order of these adjectives to be identical to the order of the corresponding adverbs (see Valois, 1991, Crisma, 1991).

Indeed, in both French and Italian restrictive pre-nominal adjectives with clear adverbial counterparts show the same ordering restrictions (compare the English adverbial ordering in (12-14) with the adjectival ordering in Italian and English (15-17); examples adapted from Valois (1991))

(12) a. They probably completely invaded Jupiter
b. * They completely probably invaded Jupiter
(13) a. They frequently completely invaded Jupiter
b. * They completely frequently invaded Jupiter
(14) a. They probably frequently invaded Jupiter
b. * They frequently probably invaded Jupiter

(15) a. La probabile completa invasione di Giove
The probable complete invasion of Jupiter
b. * La completa probabile invasione di Giove
* The complete probable invasion of Jupiter
(16) a. La frequente completa invasione di Giove
The frequent complete invasion of Jupiter
b. * La completa frequente invasione di Giove
* The complete frequent invasion of Jupiter
(17) a. La probabile frequente invasione di Giove
The probable frequent invasion of Jupiter
b. * La frequente probabile invasione di Giove
* The frequent probable invasion of Jupiter

However, pre-nominal appositive adjectives precede any restrictive adjective (18-20), unless the two adjectives are interpreted as a (non-restrictive) conjunction, or the appositive adjective is reanalyzed with the noun as a compound. Same results in English, using adjectives such as "beloved", "much-hated", "feared", that are typically interpreted non-restrictively (21-23).[2]

[2]In this paper I am setting aside another important class of adjectives, 'Determiner Adjectives' or Det-Adj's , ("certo", "numeroso", "simile", "altro",etc.). Just like Res-Adj require strict adjacency with the noun or another Res-Adj, Det-Adj's require immediate post-determiner position, and in the plural can appear in first position without a determiner, without triggering the usual constraints against bare plurals in Italian. With the exception of "altro" they can all appear post-nominally as well, typically with sharp meaning change. They always precede pre-N App-Adj's. See Zamparelli, 1993b, Crisma, 1991.

(18)a. Una {spudorata / strana} [falsa dichiarazione]
A {shameless / strange} false declaration
b.?? Una falsa {spudorata / strana} dichiarazione
(19)a. Un {importante / severo} [alto dirigente]
A {important / earnest} high-ranking executive
b. ?? Un alto {importante / severo} dirigente
(20)a. Un {eruditissimo / simpatico} [buon professore]
A {very-learned / nice} good professor
b. ?? Un buon {eruditissimo / simpatico} professore

(21) a My beloved future husband
b ?? My future beloved husband
(22) a This much-feared possible desease
b ?? This possible much-feared desease
(23) a This longly-hated true nemesis
b ?? This true longly-hated nemesis

2.3. Post-nominal ordering. We have so far presented a number of tests that distinguish restrictive pre-N adjectives from appositive pre-N ones, without saying whether the differences are pragmatic, semantic or syntactic in nature. Some clues about the syntactic structures involved can be gained by looking at the post-nominal position for these classes.

(15-17) above show that Res-Adj have an internal hierarchy. It comes somewhat as a surprise that in post-nominal position: (a) only one adjective from the set of Res-Adj's is possible (24) (b) always in the last position (25-26)[3] (c) often with a sharp change in meaning (a sample in (27)).[4]

(24) a. La invasione {* probabile frequente / ?? frequente probabile}
The invasion {probable frequent / frequent probable}

[3]The judgements need to be qualified. The ?? in (24) become acceptable if one can reinterpret "invasione brutale" as special *kind* of invasion (like 'sea invasion'); whenever this reinterpretation is possible, the post-N adjective should not be considered in the count.

[4]Again, some qualifications are necessary. First, not all meaning-changing adjectives are clearly restrictive in pre-nominal position; (27i-l) are App-Adj and (27m) a Det-Adj (see footnote 2). Meaning change seems to be a function of whether A is in the domain of N at SS. However, it is particularly common with Res-Adj, where it seems to involve a strict dependency of the meaning of A from the meaning of N (see (27a,b,d,g,h)). See Zamparelli, (1993b), Siegel (1976) for details.

Second, the meanings given in (27) must be intended as the *preferred*, but not always unique. In some cases (particularly with stress) both meanings can be available in the two positions. In pre-N position, this has a simple explanation: the pre-N adjective has been reinterpreted as an App-Adj, thus preserving the meaning it would have had post-nominally.

b. La invasione {?? brutale frequente / * frequente brutale}
The invasion {brutal frequent / frequent brutal}
c. La invasione {?? brutale probabile /* probabile brutale}
The invasion {brutal frequent / frequent brutal}

(25) a. La invasione {* probabile / ?? brutale / * frequente} americana.
The invasion {probable / brutal / frequent} American.
b. La invasione americana {probabile / brutale / frequente}
The invasion American {probable / brutal / frequent} American.

(26) a. L' automobile (* normale) rossa (normale)
The car (normal) red (normal)
b. Un cameriere (* discreto) veneziano (discreto)
A waiter (discreet) Venetian (discreet)

(27)

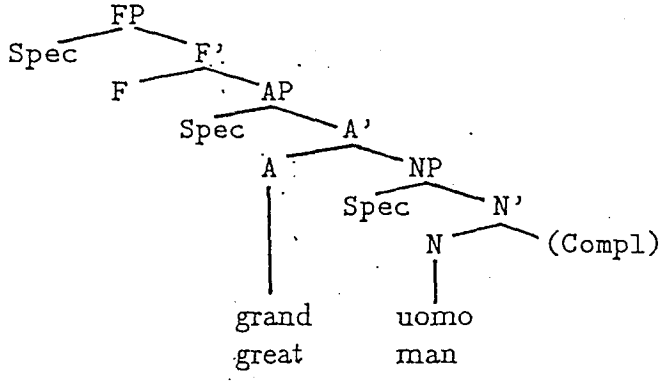
a. Un alto ufficiale	*vs.*	Un ufficiale alto.
A high-ranking officer		A tall officer
b. Un buon suonatore	*vs.*	Un suonatore buono.
A good (=well-playing) player		A (morally) good player
c. Una nuova idea	*vs.*	Un idea nuova.
A new (=another) idea		A previously unthought idea
d. Un discreto cameriere	*vs.*	Un cameriere discreto
A decent waiter		A descreet waiter
e. Il presente direttore	*vs.*	Il direttore presente
The current director		The director who is here
f. Una normale segretaria	*vs.*	Una segretaria normale
A plain secretary		A normal secretary
g. Una vera dichiarazione	*vs.*	Una dichiarazione vera
Truly an assertion		An assertión which is true
h. Un grand'uomo	*vs.*	Un uomo grande
A great man		A big man
i. La destra mano	*vs.*	La mano destra
The adroit hand		The right hand
j. Un anonimo biglietto	*vs.*	Un biglietto anonimo
A plain card		A card with no signature
k. Un classico esempio	*vs.*	Un esempio classico
A classical example		A classic example
l. Le numerose famiglie	*vs.*	Le famiglie numerose
The numerous families		The families with many members
m.Una certa asserzione	*vs.*	Una asserzione certa
A certain assertion		An assertion made with certainty
n. Un pover' uomo	*vs.*	Un uomo povero
A pitiable man		A destitute man

A natural explanation for the data in (24-27) is that these adjectives are not post-nominal because N has 'passed' them on its way up, but because they must be inside a restrictive reduced relative clause. Just like these cases, relatives must follow other modifiers and cannot be iterated (28).[5]

(28) a. * La signora francese che e' arrivata (* che mi ha salutato)
The lady French who has arrived (who has greeted me)
b. * La signora che e' arrivata francese
The lady who has arrived French

If Res-Adj cannot appear post-nominally except in a relative clause, they must have a syntactically special status. In particular, they cannot be in a lower specifier position. In Zamparelli (1993a), extending an idea by Bernstein (1992) I have proposed that these adjectives are in fact heads of a (possibly recursive) reduced AP structure (reduced in a sense to be clarified later), taking the NP as its complement. Other adjectives would be generated in the specifiers of NP, AP and perhaps a functional projection FP.

(29)



In Romance N would raise to the head A, right-adjoin to it and then move together with the adjective to F (or higher), to have its features assigned or checked. This would automatically derive the initial position of Res-Adj, the fact that they must be adjacent to N (or to another Res-Adj), that they cannot

[5]Cinque (pc.) points out that this would also predict for this kind of post-N adjectives to be impossible before a complement of the noun. This doesn't seem confirmed in all cases (see "Una conferma certa di questi fatti" *a sure confirmation of these facts*). Maybe right-extraposition of the complement could be invoked.

be conjoined, and that some of them ("grande", "povero", "bello") may display elisions that makes reinterpretation as an App-Adj completely impossible (30).

Interestingly, the same approach extends to cover a very similar phenomenon in Irish Gealic (Kevin Donnelly, p.c.). Although adjectives are typically post-nominal in this language, a few of them can also appear prefixed to the noun, with a sharp meaning change. The meaning changes in (27) and (31), I take, are in part the result of a close, quasi-idiomatic relation between A and the incorporated N.

(30) Una grande statua
A great (=famous) statue *or* A big (=post-N meaning) statue
Una gran statua
Only: A great statue

(31) a. Cuid mho'r *vs.* Mo'rchuid
A large part Majority
b. Ciorcal mo'r *vs.* Mo'rchiorcal
A big circle A great circle (e.g. on the globe)
c. Focal sean *vs.* Seanfhocal
An old word A proverb
d. Gluaiseacht o'g *vs.* O'g-ghluaiseacht
A young (= new) movement A youth movement
e. Siopado'ir gearr *vs.* Gearrshiopado'ir
A short shopkeeper A haberdasher

3. Possible Appositive Adjectives. This leaves us with App-Adj, an heterogeneous class, counting so-called 'subjective' adjectives ("affascinante" *charming* "simpatico" *nice*), adjectives denoting physical properties ("grasso"), colors, etc.

I will propose that these adjectives are derived via movement from a lower specifier position to a position adjoined to the highest position reached by the noun by LF. To understand the motivations for this movement, we must first group App-Adj's into a unified class, and then consider in detail their semantics and their internal structure.

There are classes of adjective that cannot appear at all in pre-N position. The best-known (Giorgi&Longobardi (1991)) is the class of 'referential adjectives', i.e. adjectives like "italiano" *Italian*, "Pirandelliano" *related to Pirandello*, "canino" *canine*, etc., which seem to denote objects, rather than properties. In Giorgi&Longobardi's characterization, this 'referential quality' was in fact the factor that prevented these adjectives to appear, restrictively or not, in pre-N position.

This line of analysis seems to be supported by the behaviour of these words with the so-called "absolute superlative" suffix in Italian, "-issim-". This suffix means *extremely*, and it is completely regular and productive, appearing on any adjective whose semantics can tolerate a degree modifier.

When attached to this suffix, a referential adjective *X-ian* takes on a manner reading, roughly paraphrasable with "very much in the manner of/similar to X", "very much how X would do". In this interpretation, it can go before an appropriate noun, with a marked appositive interpretation, obeying the usual pragmatic constraints.

(32) a. Questo {*italiano / italianissimo} comportamento
This {Italian / very-italian} behaviour
b. Questa {*plastica / plasticissima} materia
This {plastic / very-plastic} substance
c. Questo {*canino / ?caninissimo} sguardo
This {canine / ?very-canine} look

Since reference to objects cannot be graded, any degree modifier would simply force the adjective into a different, non-literal meaning that, being non-referential, would be allowed in pre-N position.

Although for this class the 'referential' *vs.* 'manner' contrast is clear, the adjectives below, which are completely impossible in pre-N position and certainly not 'referencial', cast doubts on an analysis based on 'referentiality'. Many of them improve considerably once the superlative suffix is added.

(33) a. * Questa incinta puerpera
This pregnant puerpera
b. * Questa pari coppia
This even couple
c. * Questo dispari trio
This odd trio
d. * Questa femmina ragazza
This female woman
e. * Questo maschio ragazzo
This male boy

(34) a. Questo {??decorato / decoratissimo} ufficiale
This {decorated / decorated-MUCH-MSng} officer.
b. Questo {??sfondato / sfondatissimo} sacco
This {broken / broken-VERY-MSng} bag
c. Questa {??protetta / protettissima} cassaforte.
This {protected / protected-VERY-FSng} safe

From a semantic standpoint, these data are completely unexpected. Pragmatically, the [A N] combinations above are 'suitably redundant', just like "red blood" and "vast universe" in (6), and should make excellent appositive adjectives. Second, "extremely broken" is more restrictive then simply "broken", since it applies to a smaller number of objects. In general, the superlative suffix "-issim-" should make the appositive interpretation harder, not easier to get. On the opposite, this suffix improves the acceptability of virtually any appositive pre-N adjective.

4. Scalar Adjectives. The generalization that I propose to solve this puzzle is that only adjectives expressing *scalar properties*, i.e. properties that have *degrees* are possible App-Adj. Therefore, an appositive pre-N adjective must be able to be modified (in the relevant meaning) by a degree modifer such as "much" or "quite"; adjectives with this property will be called *scalar adjectives.*

This phenomenon is not restricted to Italian or Romance. The following contrast in English is due to the same factor.

(35) a * A read book.
b A well-read book
(36) a * The cited article
b This much-cited article
(37) a * The eaten vegetable
b This often-eaten vegetable
(38) a A { well-read monthly / * monthly well-read} magazine
b A { much-cited American / * American much-cited } publication

(36b) is marginally in only if "cited" is interpreted restrictively ("the cited articles can be found in the references"). (38) shows clearly that the modified participles must be external to a restrictive adjective, just like appositive adjectives in Italian.[6]

So far, the scalar aspect of possible App-Adj is not particularly enlightening. We need to show that it corresponds to a specific syntactic structure, similar to the structure assigned to mass nouns within IP. At that point, we will be able to traspose ideas originally proposed for the structure of IP by Heim (1982), Kratzer (1989) and Diesing (1992), to the noun phrase.

[6]The negative prefix also improves the acceptability of participles, see, "The undiscovered country" vs. *"The discovered country". Negation seems to introduce a scalar element, too, witness "For turists, Amami islands are even more {undiscovered / *discovered} then the nearby archipelago". Grimshaw&Vikner (1991) have an independent account to explain obligatory modifiers with verbs of creation. By itself their account does not explain the positional constraints in (38).

4.1. Scalar adjectives and their semantics. To understand the structure of scalar adjectives, i.e. adjectives that can be modified with respect to their degree, we need to consider some of their semantic properties.

Let's begin by defining some terms. Modifiers such as "very", "rather", "quite", "extremely", and the Italian suffix "-issim-" *extremely* will be called *indefinite degree modifiers*, and expressions like "6 feet", "2 meters", "30 degrees C." etc., *definite degree modifiers*. An important difference between definite and indefinite degree modifiers is that the former contain units of measure that are very specific to the adjective used, while the latter can be applied to any scalar adjective. Pretheoretically, this suggests that the relation between definite degree modifiers and adjectives is stricter, and that something akin to selectional restrictions is at work.

Only a subset of all scalar adjectives have definite degree modifiers. There is "200 C. hot", but nothing like "200 *hedons* happy". Prima facie, this is due to the fact that 'happy' is subjective, and therefore not exactly measurable, while 'hot' is not. On the other hand, a person can find 'hot' what for another, in the same context, is merely 'warm'. However, what is subjective here is the point at which a given point along an *objective* scale of temperature is called "hot". No such objective scale exists for 'happy'. 'Hot' and 'happy' might well be both objectively unmeasurable, but 'temperature' *is* measurable, while 'happiness' is not. When a scalar adjective denotes a measurable abstract property, units of measure—pounds, feets, degrees and the like—are potentially available.

However, the set of adjectives that tolerate definite degree modifiers is still smaller than the set of adjectives that have appropriate units of measure (39). The appropriatness of the unit can be tested using the comparative form, which, suprisingly, does allow measures (39b,c).

(39) a. A 200 Kg. {heavy / *fat} man
b. A 3 gr. {heavy / *light / lighter} letter
c. A 2 mm. {thick / * thin / thinner} plate

Modulo lexical variation, this is possibly a semantic universal of human language. We can trace the phenomenon back to nouns.

Many abstract nouns are ambiguous between referring in a neutral fashion to a scalar property (possibly with negative and a positive values), or to a positive value interval on that scale. For instance the *scales* named by "beauty", "wealth", "hardness" can have among their degrees "ugly", "poor" and "like chalk", but there is another meaning of "beauty" (as in "her beauty amazed me") that refers to a noteworthy positive value (a 'degree') along the same scale. This ambivalence is not shared by other abstract nouns, in particular those denoting a *negative* value along a scale: "ugliness", "poverty", "softness". These words can never denote the scalar property in itself—only a negative value along the scale.

The asymmetry carries over to adjectives. By itself, "deep" doesn't mean 'having a degree of depth'. It means, instead, 'heaving a considerable positive amount in the scale *depth*'. Likewise, "sizable" doesn't simply mean 'having a size (any size)'. The alternance between the 'degree' and the 'scale' interpretation reappears when adjectives they are modified by definite degree modifiers. So, a "2 mm. thick book" is not "thick" (for a book). The presence of an overt measure cancels the 'default' degree. Interestingly, this behaviour is paralleled by implicit arguments in verbs like "eat" ("Fido eats" vs. "Fido eats rusty nails"; 'eating nails' is not canonically 'eating').

Again, adjectives denoting negative properties do not have this double possibility. They can only denote degrees.[7] Going back to (39) above, we see that the adjectives that do not allow a definite degree modifiers are those where the 'default' amount cannot be canceled, i.e. those that always denote a 'degree' and never a 'scale': all negatively-oriented adjectives ("light", "thin"), plus a few (e.g. "fat") that invariably refer to a considerable amount of a scalar property (here, 'weight').

4.2. The Multiple Quantification Constraint. In part, this is explained by the fact that all degree modifiers (including, in Italian, the "-issimo" suffix) are in complementary distribution (40a). Semantically, there is nothing contradictory between "very tall" and "six feet tall". (40b) also shows that although there is nothing wrong in the conjunction of two degree modifiers, cooccurrence of the superlative suffix with another vague modifier is also prohibited. These facts are reminiscent of a paradigm found with quantifiers in DP, illustrated for English in (41) (the Italian data are identical). Two non-contradictory quantifiers cannot cooccur in the same noun phrase.

(40) a. Un uomo {* molto alto / *altissimo} 6 piedi
A man { very tall / tall-VERY-MSng} 6 feet.
b. Un uomo {molto, molto alto / * molto altissimo}
A man {very, very tall / very tall-VERY-MSng}

(41) a. {The / * Few} three sand grains
b. * The three few sand grains

In light of these facts, I propose a constraint on quantificational modifiers that I shall call *Multiple Quantification Constraint.*

[7] Correspondingly, they can never be used in questions, when there is no expectation for the answer to be negative: "How {long / heavy / warm} is it?" vs. *"How {short / light / cold} is it?".

Multiple Quantification Constraint (MQC): Two quantifiers or degree modifiers in the same noun phrase cannot modify the same object.

Most likely, the MQC can be reduced to the Principle of Full Interpretation, the same principle ruling out *"Who what did Mary see?". Here, two operators compete for the same variable. We can assume that at LF, all operators, including quantifiers and degree modifiers require a variable to bind in order to be interpretable. The theory of unselective quantification (Heim, (1982), Diesing, (1992)) suggests that the variable-operators mapping doesn't need to be biunique: more variables can be mapped to a single operator. The constraint against vacuous operators shows that the converse is not possible.

4.3. The position of Degree Modifiers. We have said that the unit of measure within definite degree modifiers seems to be selected by the adjective. 'Tall' requires a measure of height. This suggests exploring the idea that measure phrases are optional complements of A (on a pair with DP's as "A distance of 2 Km."). No measurable property seems to have other complements, so this position won't interfere with 'canonical' objects.

But if phrases like '1.50 meters' are arguments, we face a problem with Case. It is widely accepted that nouns and adjectives cannot assign Case, and require a preposition to Case-mark their objects. In Romance and Germanic, no preposition is present with most measure noun phrases, regardless of where the measure phrase appears (42) (we will come back to the positional difference shortly). There are, however, interesting exceptions with time expressions ("in late", "in advance", "early", "late"). In (43), English and Italian are perfectly parallel: the time phrase can either follow, with a Case marking preposition, or precede, without a preposition.

(42) a. Alto (* di) 2 metri
Tall (of) 2 meters
b * 2 metri alto
2 meters tall
(43) a. In ritardo *(di) 10 minuti
In late by 10 minutes
b. 10 minuti in ritardo
10 minutes in late

This suggests that Caseless time phrases can be saved either by insertion of a preposition or by movement to a Case-marked position. I will claim that this position is always pre-adjectival, where it appears at S-structure in Germanic. In Romance, however, this movement is obscured by another movement, which is

responsible for the positional contrast in (42). Aside from time phrases, measure phrases precede the adjective in English, (and other Germanic languages), and follow it in Romance.

A basic difference between English and Italian adjectives is that the latter agree in gender and number with the head noun, while the former don't. Building on the idea of verb and noun raising (Pollock, 1989, Cinque, 1992) it seems natural to assume that the contrast between pre- and post-adjectival position for definite degree modifiers is due to the fact that in Italian A moves past the degree phrase to reach a higher agreement projection (that I will call AIP, *Adjectival Inflectional Projection*). In English, presumably, the same movement happens only at LF. This is confirmed by the fact that (43), where English and Italian behave in the same way, contains a fixed adverbial expression ("in ritardo", etc.), which doesn't need agreement.

5. The Extended AP Hypothesis. At this point we have all the elements to propose a more elaborate structure for the adjectival phrase. Minimally, such a structure should be able to host both definite and indefinite degree modifiers.[8]

Before Abney, (1987) it was typically assumed that degree modifiers could be in [Spec, AP]. A serious problem for this view is that in Italian the adjective can be extracted, leaving behind an indefinite degree modifier, but not a definite one (44). (44) should be analyzed as X' extraction in the modifiers-in-[Spec, AP] theory, an operation otherwise unattested and theoretically undesirable. Notice that adverbs like "estremamemente" *extremely* cannot be extracted either, which suggests an adjunct position, different from the position of "molto" or "assai poco".

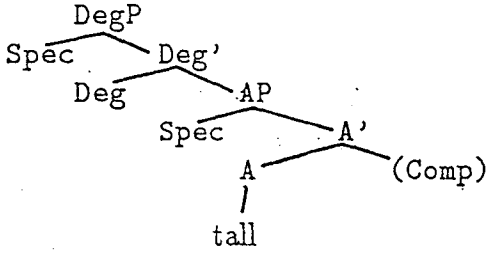
(44) a. Caro a Maria, Gianni lo e' sempre stato {molto / parecchio}.
Dear to Mary, John it-CL is always been very.
b. Coraggioso, Don Abbondio (lo) era assai poco.
Brave, Don Abbondio (it-CL) was very little.
c. Pesante, il pacco lo era {* 3 kg. / ?? estremamente}
Heavy, the pack it-CL was { 3 Kg. / extremely }

This, plus the fact that even in languages with Adj-raising "many" is never post-adjectival, suggests that "many" is in a higher position, analogous to DP in the extended DP structure.

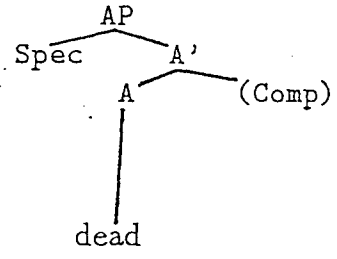
[8]The problem doesn't arise for "-issim-", which I take to be in A. In this section I will set it aside when talking about "indefinites degree modifiers", unless otherwise noted.

5.1. The lexical representation of adjectives. The structure I propose follows Larson (1988), Hale&Keyser (1991), in assuming that, universally, scalar and non-scalar adjectives have a different lexical representation, illustrated in (45a) and (45b), respectively.

(45a)



(45b)



The general idea is that the lower adjectival phrase represents the property, while DegP, contains elements that specify to what degree the property holds (and perhaps, other "connotational"information). Let's now consider the possible occupants of [Spec, DegP], [Head, DegP].

[Head, DegP] can host, minimally, a comparative particle or suffix ("piú" in Italian", "more/-er" in English), or an empty head. Let's assume, for the time being, that this empty head can be semantically active, and let's call it the 'amount operator', *OP*.

Suppose, in analogy with nominative Case assigned by INFL, that the Deg empty head OP and the comparative word "piú" *more* are able to assign Case to their specifier. A measure phrase within AP, lacking Case from the adjective, will move to [Spec, DegP] to get Case from "OP/piú". Under the assumption that lexical insertion is a last-resort strategy, movement will always occurr (however, see below for comparatives).

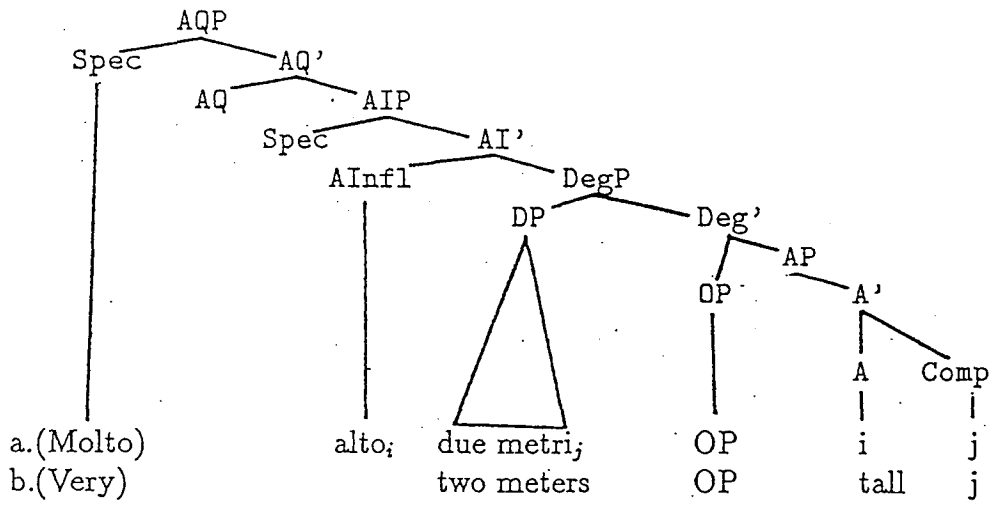
DegP's where originally proposed in Abney, (1987) and Corver, (1991), where Deg was taken to be the head of the whole adjectival phrase. In the approach I am pursuing, DegP is the complement of AIP, which in turn is the complement of something analogous to a quantifier phrase for mass nouns, containing in Italian "molto" *very*, "parecchio" *rather*, etc. (adverbs such as "estremamente" *extremely* are probably adjoined to this level). "Molto" and "parecchio" are also DP-level quantifiers in Italian; in that function, however, they agree with the noun. This suggests that within the adjectival phrase they occupy a position higher than any functional projection, while this might not be the case within DP.[9] Let's call the higher projection in the adjective phrase AQP, *Adjectival Quantifier Phrase*, noting that in general it is not the case that [Head, AQP] = [Head, QP].[10]

[9]See Zamparelli, (1993a)(1993b), for discussion.

[10]I am assuming that "molto", "very" etc. are not themselves in [Head, AQP], which should contain an empty category, licensed via its own specifier. In this paper, I will not give much

The proposed S-Structure configuration for scalar adjectives in Italian (a) and English (b) is the following.

(46)



In Romance, A moves to Deg to incorporate in the degree operator (if a DegP is present), then the resulting complex raises to AInfl. Presumably, in Germanic A raises to Deg and then AI only at LF. In both Romance and Germanic definite degree modifiers raise to receive Case in [Spec, DegP]. In the rest of this section, I will show how the semantic properties of [Head, DegP] explain the semantic facts noted in section 4.1 above. In the next section, independent evidence for DegP will be given using comparatives. Last, in section 7, we will go back to the issue of adjective phrase (now AQP) movement.

5.2. Semantics of OP. The semantic facts noted in section 8 are not explained away by the MQC. In particular, the alternance of positive scalar adjectives between a 'degree' interpretation and a 'scale' interpretation calls for a deeper explanation. Having posited a DegP, we are now in the position to advance a split theory of the 'degree' interpretation. Let's suppose that all scalar adjectives that can be modified by definite measures, by themselves *always* denote a scale, and that the 'degree' interpretation is entirely provided by the empty degree operator OP. This would make OP semantically parallel to the empty existential determiner in (47a), interpreted as 'some unspecified positive amount'.[11]

evidence for this idea. "Molto/very" can clearly be specifiers in "molto poco" *very little* (vs. "* Poco molto"). Other evidence comes from their behaviour as DP-level quantifiers. See Zamparelli, (1993b).

[11]See Longobardi, (1992) for extensive discussion on empty determiners and their semantics.

(47) a. Gianni ha versato acqua (a galloni)
John has poured 0_{Det} water (by the gallon)
b. Gianni ha versato molta acqua (?? a galloni)
John has poured much water (by the gallon)

Notice that, given the structure above, we have three loci for quantification within adjective phrase: the DegP, the AQP, and the word itself, via suffixes like the Italian superlative suffix "-issim-". The MQC dictates that only one of them can be overtly filled. But now we have an asymmetry: when a definite degree modifier is present, the 'degree' meaning of OP vanishes, while when an indefinite modifier is present (including "-issim-") OP is always semantically active.

To show this, suppose that 'tall', said of a person, means 'at least 1.80 meters'. A definite degree modifier always cancels this vague default amount (cf. (39b,c)), but an indefinite degree modifier *never* cancels it—it only adds or subtracts to/from the amount. "2 metri" always counts from zero, never adding to a default value. Likewise, even in the clearest context of what 'tall' means, "– 2 cm. tall" cannot mean '2 cm. short of the amount that makes a person *tall*'. On the opposite, "molto/poco" always count from the default value. This would be hard to explain under the hypothesis that the scalar reading of the adjective is available to definite modifiers as a lexical ambiguity, while if the 'degree' interpretation is due to an empty OP, the result is not surprising. We need to stipulate that the semantic effect of OP in Deg is canceled when there is some element in [Spec, DegP]. When an indefinite degree modifier is present, it is either a suffix in A, or a quantifier external to DegP. In either cases, the MQC forces [Spec, DegP] to be empty, and OP is possible.

Let's consider two other cases. Negative scalar adjectives ("short", "thin", "empty", etc.) and several positive adjectives, ("fat", "cumbersome") never have the 'scale' interpretation. In this cases, the semantic role of OP—fixing a degree—is taken by the adjective itself. The reason why this class of adjectives is incompatible with a definite degree modifier cannot be the MQC, since this would incorrectly predict that any degree modifier is impossible. I will tentatively assume that measure phrases require an adjective that neutrally denotes a 'scale'. "2 gr. light" in (39b) is then out because "light" cen never refer to the scale "weight".

Adjectives modified by valutative suffixes (In Italian "-in-" *small/a little*, "-on-" *big*, "-icci" *-ish* (as in *reddish*), etc.) are yet another case. Morphologically, these suffixes appear outside all derivational affixes, and inside all inflectional ones, like "-issim-". They can marginally appear with some indefinite degree modifiers and comparatives (48a,b), but cannot cooccur with the superlative suffix (48c), and with any definite degree phrase. They never allow complements (50).

(48) a. Un pacco {assai/ ?cosi/ ?molto/ ??estremamente/ ??piu'} pesantuccio
A pack {quite / so/ very/ extremely/ more} heavy-DIM-FSng
b. Una casa {*piccolinissima / *piccolissimina}
A house {small-DIM-VERY-FSng / small-VERY-DIM-FSng}
c. * Un pacco pesantuccio 8 libbre
A pack heavy-DIM-FSng 8 pounds

Probably, suffixes of this sort force a degree interpretation of the adjective, inducing a violation of the MQC when other degree modifiers are present.[12]

The fact that some indefinite degree modifiers , but never "-issim-", are acceptable with valutatives suggests a descriptive generalization of the principle stated at the beginning of section 4: *Only adjectives that can have a superlative suffix can appear as App-Adj's.* In fact, adjectives modified by valutatives become impossible in pre-N position (50). This is also confirmed by a peculiar restriction on possible pre-N color adjectives (Zamparelli, 1993a).

Defective color adjectives,("blu", "rosa" *pink*, etc.), lacking both agreement and the possibility of bearing a superlative suffix, are impossible in pre-N position, even if they can be modified by "molto", "poco", etc. (52b vs. a,c).

(49) a. Questa {bella / * bellina} ragazza
This { beautiful / beautiful-DIM-FSng} girl
b. Questo { rosso / * rossiccio } sangue
This {red / reddish } blood

(50) a. Una ragazza {cara / * caruccia} a Maria
A girl {dear / dear-DIM-FSng} to Mary

(51) * {bluissimo, fucsiissimo, beigissimo, rosissimo, violissimo, indacissimo}

(52) a La {rossa / gialla / nera / bianca / rosea ...} bandiera
The {red / yellow / black / white / pink-FSng ...} flag
b)* La {blu / viola / beige / fucsia / rosa} bandiera
The{blue / purple / beige / fucsia / pink-0} flag
c) La bandiera {blu / viola / beige / rossa / gialla}
The flag {blue / purple / beige / red / yellow}

The most interesting interpretation of these data is that the lack of superlative suffix is a symptom of the lack of DegP. Defective adjectives (all denominal or foreign loans) would lack AIP as well, while both valutatives and defective color adjectives might still bear an AQP projection. This hypothesis, if on the right

[12]Interestingly, all suffixes acceptable on adjectives in Italian return a *lesser* degree of the property (in Italian suffixes like "-on-" *big*, when applicable, turn the adjective into a noun).

track, implies that the presence of DegP is the necessary (and perhaps sufficient) condition for an adjective to be an App-Adj. I will come back to this point in section 7.

6. Comparatives.[13] Corver (1991) proposes that comparative expressions such as "more" are heads of a DegP; this hypothesis has the welcome consequence of analyzing the Germanic syntetic comparative as a case of head movement from [Head, AP] to [Head, DegP]. The idea can be easily transposed to our structure, to account for the various combinations allowed by Romance and Germanic adjectival comparatives.

The underlying idea is that the two constructions in (53), both containing the comparative element "piú" *more*, have very different D-structures. (53a) is an adjective followed by a measure phrase ("more than me / more than 2 meters"), perfectly parallel to "alto 2 metri". (53b), on the other hand, is a true comparative, embedding an AP ("alto"). Thus, the phrase among square brackets is an AQP in (53a), a DegP in (53b).[14]

In (54-55) we have the data we want to account for.

(53) a. Un uomo [alto {piu' di me / piu' di 2 meters}]
A man [tall {more than me / more than 2 meters}]
b. Un uomo [piu' alto di me]
A man [more tall than me]

(54) *Italian*
a. Alto 2 cm. piu' di me
b. Alto piu' di me di 2 cm.
c. Alto piu' di 2 cm. piu' di me
d. Alto piu' di 2 cm.
e. Alto piu' di me
f. (?Di) 2 cm. piu' alto di me
g. Piu' alto di me di 2 cm.
h. Piu' alto di 2 cm. di me
i. Piu' di 2 cm. piu' alto di me
j. * Alto piu' di 2 cm. di me
k. * (di) 2 cm alto piu' di me
l. * Me piu' alto di 2 cm.

(55) *English*
a. * Intelligent 2 I.Q. points more than me

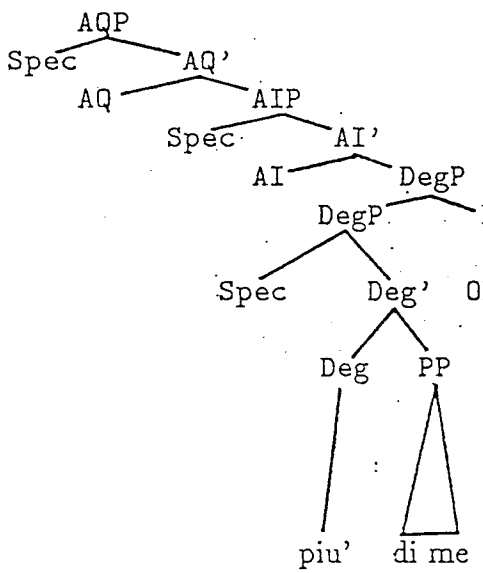
[13]This section was developed with Birgit Alber

[14]In (54c) and (55i), a DegP is embedded as measure phrase within an AQP containing a comparative. DegP's can of course embed other constituents as well, see "piú morto che vivo" *more dead than alive* "piú nuotare che correre" *more to swim than to run*, etc. I will not discuss these cases here.

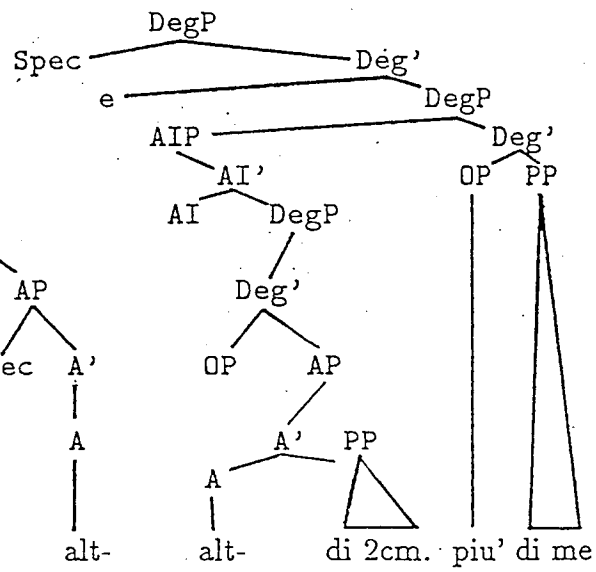
b. * Intelligent more than me by 2 I.Q. points
c. * Intelligent more than 2 I.Q. points more than me
d. * Intelligent more by 2 I.Q. points
e. * Intelligent more than me
f. (??By) 2 I.Q. points more intelligent than me
g. More intelligent than me by 2 I.Q. points
h. ? More intelligent by 2 I.Q. points than me
i. More than 2 I.Q. points more intelligent than me
k. * (by) 2 I.Q. points intelligent more than me

The D-Structure for AQP's (54a-e) is (56), the D-Structure for DegP's (54f-i, 55f,i) is (57). (56) is the regular adjectival structure in (50) with a DegP containing "piú" in its specifier. (57) is a more complex structure, which reflects the fact that an adjectival comparative of the form [more P (by X amount) than Y] has two arguments, Y, that we shall call the *reference term*, and X, the *excess term*. The excess term must be a measure phrase, and it is optional, while the reference term is obligatory, must be translatable into an appropriate measure, but needn't be a measure itself. Rather than positing an obbligatory adjunct position for the reference term, we will pursue a Larsonian approach to double complements, invoking a recursive DegP structure with the comparative element "more/-er/piú" raising to the highest operator, and an AIP in the specifier of the lower DegP, with the 'excess' measure phrase in the (Caseless) complement position.

(56)



(57)



Now we derive the well-formed possibilities in (54) and (55) via three independently motivated movements, plus a principle of Economy of Derivations (Chomsky, 1991, 1992), and some version of the Consistency Principle, proposed on independent grounds in (Giorgi&Longobardi, 1991).

(a) In both English and Italian, "more/-er/piú" in (57) moves to the higher [Head, DegP]. Perhaps this movement is needed to license an empty Deg; different motivations, or even different structures might work as well, as long as they preserve a double complement and a high specifier position which is Case-marked by the degree head.

(b) In both languages, the Caseless 'excess' measure phrase in AIP has the option of either inserting a preposition (in (54b,c,d,e,g,h,i)) or moving to the empty specifier of DegP (54a,f, 55f,i). The latter option is not open to reference terms (witness (54l)), probably because the preposition in this term is not a simple Case marker, but is subcategorized by the comparative. (54b, 55g) are derived by right-extraposition of the measure phrase.

(c) In addition, in Italian A moves to AI to receive ϕ-features. In English, where A doesn't move at S-Structure, the ill-formedness of (55a-e) follows from the Consistency Principle,[15] which prohibits projections with complements expanding on the right a lexical category in a left-recursive language like English. On the other hand, in English and German A can (or must) move from within the specifier of the lower DegP in (57) to the head of the higher DegP, generating the syntetic comparative.

If we assume that movement is always driven by some motivation (Case, agreement, perhaps focus for extraposition), the structures in (56-57), plus the three kinds of movements given above exhaust the possibilities in (54-55). (54k), for example, is out because the measure phrase does not receive Case in [Spec, AQP], and the movement is not otherwise motivated.

In conclusion, in this section we have shown that assumptions made elsewhere in the paper (in particular, a DegP with Case-marking properties, agreement-driven Adj-movement and definite degree modifiers generated as complements of A) lead to a very promising account of adjectival comparatives. Although this is far from being an exhaustive account of comparatives, and many questions remain open, this outline constitutes a strong indirect support for our direction of inquiry.

1. Nuclear Scope in DP's. Let's conclude this paper by turning back to its original questions. If there is a class of pre-nominal adjectives that is derived by movement, what is the motivation for this movement? And what is the connection with the presence of a DegP?

[15] *Consistency Principle.* "An XP immediately expanding a lexical category on the non-recursive side is directionally consistent in every projection" (Giorgi&Longobardi, 1991)

Empirically, we have the data in (6), (7) and (8), and some of the meaning shifts in (27) where the prenominal adjective is clearly appositive (see footnote 4). A generalization from these data is that the meaning of a pre-N App-Adj, aside from being non-restrictive, is in some sense more "absolute" and less dependent on the context set up by the noun. "Rosso" *red* means 'prototypically red', "grande" *big* means 'big in an absolute sense'.

On the other hand, we have the semantics of OP, discussed in section 5.2. The conclusions reached there were not very satisfactory. If OP is a real (albeit phonologically empty) operator, with its own semantics, we have to explain why its meaning is not active when its specifier is full.

There is however an alternative, proposed in Kratzer (1989) and Diesing (1992) to explain the two readings of bare plurals, 'existential' or 'generic', in Germanic languages. According to Kratzer/Diesing, a bare plural is interpreted existentially when it is in the scope of a default existential operator, spanning a certain portion of the sentence, called the *nuclear scope*. This operator is a 'default' in the sense that it binds all the free variables left after binding by other quantifiers has been established. Outside the nuclear scope, a bare plural must be bound by a generic operator G, or by an overt quantifier. For Kratzer/Diesing, the nuclear scope corresponds to VP. Longobardi, (1992) discusses a variation of this idea in which bare plurals are always preceded by an empty determiner, which takes an existential meaning when in the nuclear scope.

Suppose now that this idea can be extended to DP. The nuclear scope in DP is the position reached by N at LF. Within this scope, the empty head of a DegP, when it is not specified by a measure phrase in [Spec, DegP], receives a default interpretation, which is an existential quantifier over a degree of a scalar property. The 'amount' of this existential is critically determined by the noun; so, a 'small elephant' is bigger than a 'big ant'. When an adjective is pre-N and appositive, the empty 'quantificational' head cannot be bound by the existential closure, so it must be bound by something else, perhaps a discourse-level operator akin to the 'kind' operator (responsible for the 'absolute', prototypical flavor of color App-Adj), or controlled by the pragmatic environment.

Diesing, (1991) also assumes that the generic operator cannot bind an object within the nuclear scope.[16] If this is correct, we have a reason for an AQP[17] in a low specifier to scope out of the domain of N at LF (S-structure, in Romance). This reason is semantic in nature: an adjective moves in pre-nominal position to

[16]This forces her to assume that generically-interpreted objects raise at LF outside VP. The constraint against G in the restrictive scope might be of better interpreted as a hierarchy of defaults: G applies by default to variable that are free (because out of the restrictive scope) after the default existential operator has applied.

[17]Or an AIP. Interestingly, 'long' indefinite degree modifiers are impossible in pre-N position.
(a) Un ({* molto / * estremamente / ? assai / così }) maleducato comportamento
A ({very / extremely / quite / so}) unpolite behaviour

prevent its empty Deg head to be bound by existential closure, and to give it the possibility to be bound by 'something else', be it a generic or a context-controlled operator. 'Subjective' adjectives, for instance, ("beautiful", "interesting", etc.) are completely independent from the denotation of the noun, and could be easily thought to be determined w.r.t. a 'generic experiencer'. Interestingly, this class of adjectives is the one which is most commonly found in pre-N position across Romance.

8. Conclusions. What I have sketched in this paper is a broad description of the internal structure of adjectives, and of the way this structure interacts with their position within DP. At the same time, it is an exploration of the syntax-semantics interface in one of the less studied domains in generative linguistics. Obviously, much more work remains to be done.

Elsewhere, I have argued that pre-N adjectives in Romance belong to two different categories, Res-Adj and App-Adj. Res-Adj are restrictive; they need to be adjacient to N or to another Res-Adj, and can appear post-nominally only as reduced relative clauses. Typically, they are *not* scalar, and cannot be modified by a degree modifier (58)[18].

(58) a. *La {frequentissima /verissima /fintissima /sicurissima}
The {very frequent /very true / very fake /very sure}
distruzione dei documenti.
destruction of the documents

I have argued that they are pre-nominal because N right-adjoins to them via head movement, and then raises to receive agreement. The most likely structure is a recursive AP, without DegP, AQP or AIP ((59) is the simplest case). Agreement features could be provided (or checked, see Chomsky 1992), by the [Head, FP]. The ordering should then be enforced by semantic constraints.

(59) ... $[_{FP}\ [_{AP}$ A $[_{NP}$ N]]]

App-Adj have a much more complex structure, including a quantificational phrase AQP and a Degree Phrase, whose specifier is a Case-marked position. This assumption, plus the idea of agreement-driven adjective movement explains a variety of word-order and semantic phenomena in English and Italian. Several of these facts transfer directly to Romance and Germanic languages in general; for others, a cross-linguistic study of the underlying structure of DP and AQP is necessary. I leave it for future work.

[18]The asterisk refers to the possibility of the same restrictive reading as in (2).

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