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The Structure of DPs: some principles, parameters and problems

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The investigation of the internal structure of nominal constructions has recently provided important evidence for at least three aspects of syntactic theory:

a) the syntactic representation of empty categories
b) the deductive depth of parameter theory
c) the form of the syntax-semantics mapping

The results so achieved begin to provide a preliminary reference framework for parametric descriptions of Determiner Phrases across the world's languages: they concern both the lexical structure and the functional structure surrounding head nouns and will be examined in turn.

Part 1. Lexical Structure

1. Arguments

1.1. Hierarchies of arguments

The first thing to be observed is that within DPs the principal arguments of the head noun are hierarchically ordered in a way roughly similar to that found in clauses: thematic **S**ubjects (e.g. Agents) are higher than direct **O**bjects (e.g. Themes) and other complements. Evidence for this conclusion is found in both English and other Germanic and Romance languages.

DPs also involve the possibility for another argument or quasi-argument to appear, the so-called **P**ossessor or R-related phrase in Higginbotham's (1983) sense, which does not exist in clausal structures. Hierarchically, Possessors are higher than Subjects. Evidence for this conclusion cannot be found in English, for reasons which will become clear in 1.4.2 below, and was mainly provided by the Romance languages.

The conjunction of the two generalizations leads one to assume the following hierarchy: P>S>O. The first two arguments will be called external, the third one internal. Converging evidence for such hierarchy comes from two quite distinct domains.

1.1.1. Possessivization evidence

The first and older type of evidence for the hierarchy above comes from the following considerations: most European varieties admit, under variable conditions, two ways of formally realizing the P, S, and O arguments of the noun: 1) through a prepositional form (English *of*, German *von*, Romance *de* or *di*), steadily postnominal; 2) by means of either a postpositional affix (like Germanic *s*, with crosslinguistically different properties) or a special possessive form, often agreeing with the noun like an adjective or a determiner (cf. 1.3.1). Now, it is very generally the case that type 2) realization (henceforth called possessivization) is subject to these limitations:

a) if only one among P, S, and O is present, then (with one major exception (cf. 1.2.1)) it will always be able to assume type 2) form;
b) if P is overtly present, only it will be able to assume type 2) form;
c) if P is not overtly present and S is, only the latter (i.e. no O) will be able to assume type 2) form;

These facts, first identified in their entirety by Milner (1978) for French, automatically lead to the assumed hierarchy: P>S>O. In Romance at least the very same hierarchy of arguments so defined

by their accessibility to possessivization, is reproduced by another class of phenomena, namely their accessibility to extraction from the DP through wh-movement or cliticization. The empirical generalization can be formulated as follows:

> Of the phrases in the frame of a head N, only one representing an argument expressible through possessivization can be extracted from Nmax.

The results of extraction tests, thus, confirm those of possessivization tests (cf. Cinque 1980, Giorgi and Longobardi 1991).

1.1.2. Binding evidence

There is some evidence that this hierarchy in the formal realization of arguments of N is tied to and reflects properties of the NP-internal phrase structure. This evidence comes from a classical constituency testing ground such as c-command relations, as manifested in a number of binding asymmetries between pairs of arguments. For instance, given any pair of arguments among P, S and O, one containing an anaphorically or quantificationally bound expression and the other representing the antecedent of such a binding relation, it is invariably the case that (essentially irrespectively of the surface linear order) P always represents the binder, O always contains the bindee and S may bind inside O but never inside P[1]. Given standard assumptions about c-command, these facts suggest an asymmetric c-command hierarchy among the three types of arguments precisely of the form P>S>O.

Thus, the hierarchy appears to be structurally represented as follows (order irrelevant):

(1) [P [S [O ...N...]]]

The same conclusions are reached from disjointness considerations: an R-expression embedded within O or S is necessarily disjoint from P and one embedded within O is disjoint also from S. No restriction holds viceversa. It is clear that these facts as well are derivable from the structural assumption in (1) and, thus, support it.

Further tests confirm that the only direct argument of some nominalizations corresponding to unaccusative verbs is internal, in the sense of structurally behaving like a O.

It is worth remarking that the suggested structural hierarchy applies, with the same results, to *all* nouns, whether they denote physical objects (*book, portrait*) or complex events (singular action nominals like *destruction, assignment*), in Grimshaw's (1990) sense.

1.2. 'Passivization' properties

1.2.1. 'Affectedness'

A well established restriction in English is that some Os cannot appear in the possessivized form even if no overt S or P is present. Most head nouns displaying this restriction are characterized by their assigning a semantically 'unaffecting' q-role to their objects (cf. Anderson 1979):

(2) a. The perception/knowledge of the problem
b. * The problem's perception/knowledge

A plausible approach to this class of nouns was suggested by Jaeggli (1986): these heads would be unable to give up the syntactic projection of their external argument (S), which would

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[1] Cf. Giorgi and Longobardi (1991), with results confirmed by Siloni (1990) and Taraldsen (1990) among others.

then be obligatorily realized, at least in the form of an empty pronominal category. Such a category, then, and an overt possessivized O phrase can be assumed to compete for one and the same structural position, so that the necessary presence of one (say, the empty subject pronominal) will exclude the other, e.g. an O with the usual *'s* suffix. The latter item will then be only expressible in the postnominal *of* form. The same constraint is not at work in other languages, like German and Romance (cf. 1.4.2 below).

The condition on the ineliminability of the syntactic realization of the subject with the lexical heads in question seems independently supported by the analogous impossibility for the lexically corresponding verbs to occur in middle constructions:

(3) * The problem perceives/knows easily

this is another environment where the promotion of the object to a subject-like form appears to necessarily destroy the possibility of syntactic realization of the underlying subject role, as suggested by the known disappearance of control and binding activity on the part of this latter argument:

(4) * The ship sank to collect the insurance

1.2.2. Passive or middle?

The phenomenon of possessivization of O mentioned above bears some superficial resemblance to passivization in clauses: thus it has often been referred to as 'passivization' of NPs. This is likely to be a mislabeling: in fact, at a closer look, the analogy breaks down in at least four respects:

1) One has already been mentioned in the previous section: in English unaffected objects cannot be possessivized, while they can passivize in clauses.

2) In English it has been discovered that possessivization of the object destroys any trace of syntactic activity of the understood subject role as a controller (Roeper 1984):

(5) a. The sinking of the ship (to collect the insurance)
b. The ship's sinking (*to collect the insurance)

The same is true for binding relations (Giorgi and Longobardi 1991), which provides a powerful argument against the proposal of treating Roeper's examples of 1.2.2 as cases of event control rather than argument (subject) control:

(6) a. The testing of such drugs on oneself
b. * This drug's testing on oneself

As noticed, this is paralleled in verbal constructions by middle formation, but not by passives, whose underlying subject role continues to be active in binding and control:

(7) a. The ship was sunk to collect the insurance
b. This drug must first be tested on oneself

3) In some languages other than English or French, where *by* and *par* are used in both constructions, the preposition introducing the expression of the agent in nominals with a possessivized object is not the same as the one expressing the agent in verbal passives (cf. Italian *da* vs. *da parte di*, German *von* vs. *durch*). The difference might perhaps be related to the different

intrinsic semantics of the prepositions: *by* and *par* display some independent instrumental meaning, not shared by *da* and *von*).

4) Languages normally have quite distinct morphological forms for passive verbs, but not for 'passive' nouns; again this recalls middle formation for verbs. Perhaps this fourth is the most basic difference between the processes of object promotion in NPs and clauses, indirectly responsible for the others.

On the whole, then, possessivization of the object of a noun looks rather like the nominal counterpart of middle formation rather than clausal passivization.

Notice that the first two restrictions reduce to the proposed hypothesis that object possessivization precisely obliterates the position for empty realizations of the subject argument (cf. 1.5.3); this approach implies the important conclusion that both control and binding require a syntactically realized empty category, not just a q-role in the grid of a lexical head, as an antecedent; the difference with verbal passive could then reside in the fact that the special morphology of passive (as opposed to middle) verbs might take up the task of realizing this argument (cf. Baker, Johnson and Roberts 1989).

Finally, it must also be recalled that the properties in 1) and 2) apply to English and Mainland Scandinavian, but do not appear in German and in the Romance languages. For an explanation of this important parametric difference cf. 1.4.2 below.

1.3. Case

1.3.1. Case positions

The most salient Case-theoretic property of nominal constructions is the crosslinguistically frequent contrast between Case realization of both S and O with nouns and in clauses. In other words, many languages tend to use a special Case, Genitive, normally the same employed to express P, for the arguments of nouns whose verbal thematic correspondents bear Nominative and Accusative. The shape assumed by these 'genitive' arguments is at first sight quite heterogeneous, both crosslinguistically and often language-internally. A major divide, which has already been mentioned, separates instances of Genitive Case realized by means of a *preposition* from the others, which have been collectively gathered under the label '*possessive* or possessivized forms'. The apparent maximum of heterogeneity is found among these latter. There are at least five different ways of formal realization:

(8) a. a phrase-final affix (e.g. English '*s*)
b. a word-final affix (German *s*, Arabic *i*)
c. an inflectional (really fusional) ending (Latin or Slavic Genitive)
d. **f**-feature agreement with the noun (Romance/German possessives)
e. zero-realization (Hebrew construct state Genitive)

In most of the better known European languages, at least types (8a, b, d, and e) sharply contrast with prepositional Genitive because they may surface relatively high in the DP structure, i.e. they can precede attributive adjectives under a normal intonation, a possibility excluded for prepositional genitives. Furthermore, the types in (8a, b, and d) may surface prenominally, again as opposed to (stylistically normal) prepositional genitives. Type (8e) (also accompanied by corrresponding agreement on the head in some languages, such as Hungarian) happens to occur just postnominally as well, though normally clearly higher than prepositional genitives, most typically immediately after a noun fronted to the D position in so-called construct state constructions (cf. 3.2.5. below for references). Therefore, its postnominal occurrence seems to have nothing in common with that of prepositional Genitive, which appears to be structurally quite lower. Types

(8a, b, d, and e) may also occur in postnominal and postadjectival position, though apparently still always preceding prepositional genitives in case of cooccurrence.

Notice, further, that it seems possible, in at least one case, exemplified by German, for two possessive genitives to cooccur, one prenominally and preadjectivally, the other postnominally and postadjectivally:

(9) Marias sorgfältige Beschreibung Ottos
Maria's accurate description of Otto

As a result and a summary of these observations, the previous scheme (1) could be embedded in the more complex structure (10), made available in principle by UG and slightly parametrized in a way discussed below:

(10) [**1** GenS **2** AP **3** GenO [$_{\alpha}$ P [S [O ...N...]] $_{\alpha}$]]

In (10) the numbered positions **1** through **3** set out some crosslinguistically possible surface positions for the noun (cf. 2.1. and 4.2. below), GenS and GenO the high and low position for possessivized Genitive, respectively, and AP a potentially iterated position for attributive APs (cf. 2.1.); as the null hypothesis, one may suppose that the necessarily lower position(s) for prepositional genitives will correspond to the base ones of P, S, and O contained within the phrase α. As above, linear order is essentially undetermined within such a phrase, while it is crucially encoded in the rest of (10)[2].

Finally, we know too little of the syntax of the type in (8c) to establish with certainty whether it patterns like prepositional or possessive genitives, and will leave the topic for further investigation[3].

1.3.2. Equidistance and ergativity

Crosslinguistically, there are thus two positions for non-prepositional Genitive, one higher than adjectival modifiers, the other lower. Languages make the parametric choice of activating just one or the other or both. As a first approximation, Semitic languages, modern Romance and Hungarian are likely to activate only the higher one, Celtic languages only the lower, while several continental Germanic varieties might be argued to activate both.

A natural question is whether these positions bear some correspondence to the analogous clausal ones which are used for Nominative and Accusative (or Ergative/Absolutive, respectively, according to Chomsky's 1995 equidistance theory). The clearest evidence of some correspondence is provided by languages like German, activating both positions, though with no formal contrast in the realization of Case. Here, the usual hierarchy P>S>O reappears for the choice among the arguments competing for the higher possessive position. So *Marias* may only be a Subject or a Possessor in (9) above, and *Ottos* must be an Object or a Subject[4].

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[2] Data such as those studied by Pearce (1998) suggest the possibility of a parametrization according to which in some languages it would just be the structural position of the genitive that determines its form, in others, like Maori, it would rather be the thematic interpretation that plays such a role.

[3] A conceivable generalization concerning languages with type (8c) genitives might be that they do not display (alternations with) prepositional genitives, as is instead the case with the other four listed cases.

[4] Classical coordination tests suggest that the linear sequence in (10) corresponds to a regularly right-branching hierarchical structure:

a. Marias [sorgfältige Beschreibung Ottos und wunderbare Photographie Zeldas]

This configuration of facts obviously reminds of the distribution of the higher Case (say, Nominative) and lower Case (say, Accusative) to thematic subjects and objects of transitive verbs, respectively. If only one argument is present, however, it may occur in either position, therefore including the lower one, with any interpretation:

(11) a. Marias Beschreibung
Maria's description
b. Die Beschreibung Marias
The description of/by Maria

In Chomsky's (1995) terms, this behavior neutralizes for nominals the supposed distinction between Nominative and Absolutive and the relative language types manifested in verbal systems.

1.4. Syntactic realization of arguments

1.4.1. Order

We have already briefly sketched some generalizations concerning the order of arguments of nouns relative to the head noun itself and to attributive adjectives. Such generalizations are likely to follow from

1) Case theory (cf. 1.3. above)
2) the theory of the distribution of adjective phrases (cf. 2.1. below)
3) the theory of the structural positions within DP attracting the head noun (N raising: cf. 2.1. and 4.2.1. below).

The question of the relative ordering of prepositional arguments of nouns with respect to each other is instead more obscure. As mentioned, they all follow the head noun and adjectives in the best known languages, but seem to be relatively free in this postnominal position. The Romance languages, which admit an abundant recursion of prepositional arguments in their nominals, should constitute one of the most appropriate testing grounds; but just a few tendences and empirically subtle preferences can be recorded.

The structural P>S>O hierarchy is only vaguely encoded in the linear order, precisely in the thin and controversial preference often given to P, under a normal flat intonation, as occurring as the outermost prepositional genitive in a cluster of two or three.

Slightly clearer is perhaps the preference for P and S, at least, to precede non-genitive prepositional arguments (PPs not introduced by *de, di*) and for genitive bare nouns to occur adjacent to the head noun:

(12) a. La conversazione di Gianni con Maria
The conversation of Gianni with Maria
b. ? La conversazione con Maria di Gianni

(13) a. L'avidità di denaro di Gianni

Maria's accurate description of Otto and beautiful photograph of Zelda
b. Marias wunderbare [Beschreibungen Ottos und Photographien Zeldas]
Maria's accurate descriptions of Otto and beautiful photographs of Zelda

For *Marias* in a. and *Marias wunderbare* in b. are both understood as having semantic import over the whole bracketed sequences, which appear thus to represent coordinated constituents, hence constituents.

Gianni's greed for money
b. ?? L'avidità di Gianni di denaro

In either case, anyway, a lightly marked intonation or heaviness considerations make reverse orders quite acceptable. On the whole, it appears that no clear and theoretically derivable generalization has yet emerged in this domain.

1.4.2. Number of arguments

The most important parametric property of the argument structure of nouns perhaps concerns the number of external positions for arguments which are syntactically realizable. A first observational difference between English and Romance or German is that only one of P and S are overtly expressible in English, while in the other varieties both may occur simultaneously. In other words, it seems that only one external position is syntactically available for a genitive phrase in English nominals, (at least) two in German and Romance:

(14) * Mary's book of my favorite novelist

(15) Il libro di Maria del mio romanziere preferito

If possessivization of O, discussed earlier, is actually movement to or rather *through* a syntactic external argument position, on the reported analogy with middle formation in clauses, then a whole typological cluster of other, less superficially detectable (and hardly learnable by themselves), differential properties can be parametrically tied to the previous observation about the number of external positions (cf. Giorgi and Longobardi 1991).

The properties in question fall at least under three categories:

1) Control phenomena
2) Binding phenomena
3) Affectedness constraint (cf. 1.2.1. above)

It was noticed above (cf. 1.2.2.) how in English binding and control by an understood subject of a noun are possible, but only provided that no possessivization of the O takes place. Now, both processes remain available in Romance and German, irrespectively of whether the O is possessivized or not:

(16) a. L'affondamento della nave per riscuotere l'assicurazione
The sinking of the ship to collect the insurance
b. Il suo affondamento per riscuotere l'assicurazione
Its sinking to collect the insurance

(17) a. La sperimentazione di tale droga su se stessi
The testing of such a drug on oneself
b. La sua sperimentazione su se stessi[5]
Its testing on oneself

Similar examples arise with respect to affectedness restrictions (also cf. Zubizarreta 1982):

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[5] It seems thus possible in Romance for an O to raise over S provided that the latter is a null pronominal, apparently violating the possessivization hierarchy of 1.1.1. This may suggest that Chomsky's (1995) equidistance principle must be relativized, perhaps in the sense of limiting it to overtly Case marked categories, thus excluding PRO from its scope.

(18) a. La percezione/conoscenza del problema
The perception/knowledge of the problem
(A proposito del problema) la sua percezione/conoscenza
(Speaking of the problem) its perception/knowledge

The facts seem to be interpretable as follows: recall the previous hypothesis (cf. section 1.2.2.) that binding and control are always syntactic, not just lexical phenomena, requiring an antecedent in the form of a syntactically realized, though possibly empty, phrase. Now, in English (cf. the glosses and section 1.2.2.) an empty S competes with a possessivized O for the same syntactic slot, but in German and Romance this is not the case, owing to the independently attested availability of more than one external argument position in nominals. These parametric facts strongly reinforce the argument for syntactically realized empty positions and their role in coreference phenomena.

The treatment of the already mentioned contrast between English/Scandinavian and Romance/German with respect to the affectedness constraint is the same, and follows from the assumptions already made, given the approach to unaffecting head nouns advocated above in 1.2.1.

On the whole, this crosslinguistic pattern of phenomena reinforces the argument against the proposal of treating Roeper's examples of 1.2.2. as cases of event control, rather than argument (subject) control[6].

1.5. Empty pronominals

1.5.1. Null subjects

The data discussed in the previous section already suggest that the argument structure of nouns *may* and in some cases *must* include empty pronominal categories, at least for S thematic roles. The latter assumption is widely supported by other evidence, pointing to the existence of a PRO-like category as subject of nouns. It falls into two categories:

i) evidence that some sort of PRO *may* occur
ii) evidence that some sort of PRO *must* occur, with certain nouns

Type i), in turn, comes in three subtypes:

a) evidence from binding
b) evidence from arbitrary interpretation
c) evidence from construct state

a) First, in many different languages there are cases of binding of an anaphor embedded within an NP by a DP-external apparent antecedent which does not satisfy one of the conditions normally imposed on antecedents of anaphors: *prominence* (c-command), *uniqueness* (non-split nature), *locality*, or *subjecthood* (where the latter applies). In all such cases it turns out that the phonetically unrealized subject argument role of the noun is understood as coreferential with the anaphor/antecedent:

(19) La descrizione di se stessa inviata a quella ditta è stata di grande giovamento alla carriera di Anna
The description of herself submitted to that firm was very helpful for Anna's career

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[6] Under this proposal, the crosslinguistic lack of any effect comparable to the Romance ones of the text with middle verbal constructions might be elegantly attributed to the universal uniqueness of the external argument in clauses.

Furthermore, the environments in which this type of situations arises are exactly those in which infinitives with controlled PRO subjects could grammatically replace the head noun in question:

(20) Descrivere se stessa in quel modo è stato di grande giovamento alla carriera di Anna
Describing herself that way was very helpful for Anna's career

The logic of the argument resumes and strengthens that proposed by Higginbotham (1980) with respect to the 'gate' function of PRO for weak cross over in examples like:

(21) Loving his mother is typical of every Englishman

b) Second, some DP-internal anaphors have arbitrary reference without depending on any overt arbitrary binder: again, this only arises when they occur in complement position and are read as bound by the understood subject role of the noun. Thus, some equivalent of PRO could be the primitive source for arbitrariness and occur as subject of N:

(22) Una buona conoscenza di se stessi è cosa rara
A good knowledge of oneself is something rare

All of this led Giorgi and Longobardi (1991) to the hypothesis that some counterpart of PRO is the invisible subject of such nominals and bridges the otherwise impossible (because notoriously subject to stricter requirements) antecedent-anaphor relation. Of course the syntactic, and not just lexical, nature of this bridging argument is strongly suggested by its parametric interaction with visibly morphosyntactic properties, i.e. the linear positioning and formal realization (i.e. possessivization) of an overt O argument, as evidenced before (cf. 1.4.2.). In this sense, such DP facts, combined with those of 1.4.2., represent some of the strongest evidence ever for the existence of empty categories in general.

c) The third subtype of evidence is of a slightly different nature: in so-called Romance construct state nominals (cf. Longobardi 1996) a genitive argument is obligatorily realized *non-prepositionally* and *adjacent* to the head noun, giving rise to surface N+DP+(AP) order:

(23) a. Casa Rossi nuova
Rossi's new home
b. * Casa nuova Rossi

however in some cases a N+(AP)+P(=*di*)+DP sequence appears:

(24) Casa nuova di Rossi

both apparent irregularities are regularized if the latter sequence is analyzed as actually constituted of N+PRO+(AP)+P+DP, with PRO linked in a chain to the lower genitive PP (=P+DP) and satisfying the condition on adjacency and non-prepositional realization:

(25) Casa PRO nuova di Rossi

The analysis is independently supported by typological comparison with partially parallel Semitic structures, in which the pronominal category corresponding to Romance PRO is phonetically spelt out.

In this third subcase c. the empty pronominal argument seems necessarily realized in a syntactically high position close to D, where the head noun has been apparently raised. The previous arguments a. and b. provide no evidence, instead, as to where exactly a subject empty category may be licensed in the DP structure.

Type ii. evidence is of the same sort as already seen in (20) above, though it is obtained replacing the anaphor by a pronoun or name: if with a certain nominal an empty subject *must* occur, it will be disjoint from the pronoun/name by virtue of binding principles B or C; this is exactly the case e.g. in the interpretation of

(26) La conoscenza di lui/Gianni esibita in quell'occasione (ha molto giovato alla sua carriera)
The knowledge of him/Gianni exhibited on that occasion (was very helpful for his career)

Again, the facts parallel those holding with control infinitives/gerunds:

(27) Conoscere *lui/Gianni* (ha molto giovato alla *sua* carriera)
Knowing him/Gianni (was very helpful for his career)

In either (26) or (27) the understood subject argument can never be coreferential with the object pronoun/name, as made clearer by the impossible coreference of *lui/Gianni* with an external controller of the subject position, such as *sua,* if the latter is added. This suggests that some PRO must syntactically represent it.

Not all nouns behave this way, however:

(28) a. Il ritratto di *lui/Gianni* esibito al museo (ha molto giovato alla *sua* carriera)
The portrait of him/Gianni exhibited at the museum (was very helpful for his career)
b. Ritrarre *lui/Gianni* (ha molto giovato alla *sua* carriera)
Portraying him/Gianni (was very helpful for his career)

Here no parallelism holds with the corresponding infinitive. Thus, with *ritratto* 'portrait' coreference between *lui/Gianni* and the understood agent (author of the (self-)portrait) is not excluded. This suggests that such understood role is not obligatorily realized as an empty category, which would induce a binding violation, as is actually the case in (28b).

The *knowledge/portrait* contrast in obligatoriness of a syntactic subject is not surprising, of course, given that *knowledge* was seen to fall anyway into the class of 'unaffecting' nouns, requiring an obligatory realization of the external role (cf. sect.1.2.1.).

1.5.2. Event vs. object nominals

Between the two classes is a third one, which in both English and Romance shares with the *knowledge*-class the obligatoriness of a syntactic subject and with the *portrait*-class the option of not assigning the external q-role. This class is well exemplified by action nominalizations with 'affected' objects, such as e.g. *destruction*:

(29) a. His/The president's moral destruction
b. The moral destruction of him/the president was certainly not helpful for his career

In (29b), the understood agent of *destruction* is necessarily disjoint from *John.* Thus, (29a) suggests that the subject position can be dethematized and obliterated by the raised object, (29b) that, unless the object raises, the understood subject *must* be syntactically represented.

The contrast between (29b) and (28) leads to the statement of the following tentative generalization:

(30) Event nominals (perhaps in the sense of Grimshaw's 1990 *complex event nominals*) require a syntactic external position (occupied by either S or raised O), object nominals do not

If correct, (30) draws the most salient syntactic boundary between the two much-debated types of nominals in question[7].

In general, thus, one may agree with Grimshaw (1990) that event nominals project their argument structure as obligatorily as verbs. It remains true that O may possessivize in nominals (except for unaffecting nouns), while it cannot always enter a middle construction in the corresponding verbal structure:

(31) a. The president's moral destruction
b. * The president morally destroyed

Such a difference could perhaps be imputed to Case theory, i.e. to a general optionality of Genitive marking for nominal O as opposed to a lexically conditioned optionality of Accusative marking by verbs (middle formation).

1.5.3. Null objects

In addition to null pronominal subjects, nominals also exhibit null pronominal objects. Some languages, like Italian, display an arbitrary null object of verbs, which is able, among other things, to bind anaphoric expressions (Rizzi 1986). The same is true with nominals (Giorgi and Longobardi 1991):

(32) La particolare tecnica delle sue riconciliazioni con se stessi è ciò che ha reso famoso quello psicoanalista
The peculiar technique of his reconciliations with oneself is what made that psychoanalyst famous

Two properties oppose this null object to null subjects. Its licensing is parametrically constrained: as in VPs, it is available in Italian, but forbidden in other languages, such as English. Second, unlike null pronominal subjects and, again, like its verbal counterpart, this empty category can only be arbitrary and never syntactically controlled.

1.5.4. A-positions and the evidence for empty categories

At least thematic subjects and objects of nouns seem to be basically associated with A-positions, wherefrom in fact they are able to regularly bind and control. It was argued before that Romance nominals provide more than one external position, allowing, among other things, cooccurrence of a raised (possessivized) O with a PRO subject. One may wonder whether all such positions qualify as A- or just the one of thematic subjects. Three types of considerations prove the latter answer to be correct.

Suppose, first that O is in a configuration where it cannot act as a controller from its base position, say for lack of structural prominence (c-command), but could from a higher (subject) A-position. This is exactly the case in active/passive clausal structures with control into an adverbial infinitival sentence:

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[7] If PROs cannot be meteorological subjects, unless controlled, nouns like *snow(storm)*, *rain(storm)* etc. are unlikely to ever count as event nominals.

(33) a. Gianni$_i$ fu condannato dopo PRO$_i$ aver subito un regolare processo
Gianni was convicted after facing a regular trial
b. * Hanno condannato Gianni$_i$ dopo PRO$_i$ aver subito un regolare processo
They convicted Gianni after facing a regular trial

A roughly analogous contrast (although sometimes lightly less sharp) can be found within nominals:

(34) a. La sua$_i$ condanna dopo PRO$_i$ aver subito un processo irregolare rimarrà un'infamia
His conviction after facing an irregular trial will remain a shame
b. ?* La condanna di Gianni$_i$ dopo PRO$_i$ aver subito un processo irregolare rimarrà un'infamia
The conviction of Gianni after facing an irregular trial will remain a shame

In (34b), in order to acquire proper controller status, O must be in (or rather have passed through) a higher A-position, presumably that of S, if and only if no other high position qualifies as A-. Therefore, in these situations a subject empty category should be forbidden in Romance as well and, consequently, no binding ability on the part of an understood S should remain available. Patterns like the following (in particular the ungrammaticality of (36c)) confirm this point (cf. Giorgi and Longobardi 1991 for discussion):

(35) a. ?* Disapprovo l'attribuzione del premio a Maria dopo PRO essere stato a lungo in ballottaggio tra i due concorrenti
I disapprove of the attribution of the prize to Maria after being long at stake between the two candidates
b. A proposito del premio, disapprovo la sua attribuzione a Maria dopo PRO essere stato a lungo in ballottaggio tra i due concorrenti
Speaking of the prize, I disapprove of its attribution to Maria after being long at stake between the two candidates

(36) a. L'attribuzione del premio a se stessa ha fatto di Maria un tipico rappresentante della corruzione odierna
The attribution of the prize to herself made Maria into a typical representative of today's corruption
b. A proposito del premio, la sua attribuzione a se stessa ha fatto di Maria un tipico rappresentante della corruzione odierna
Speaking of the prize, its attribution to herself made Maria into a typical representative of today's corruption
c. * A proposito del premio, la sua attribuzione a se stessa dopo PRO essere stato a lungo in ballottaggio fra i due concorrenti ha fatto di Maria un tipico rappresentante della corruzione odierna
Speaking of the prize, its attribution to herself after being long at stake between the two candidates made Maria into a typical representative of today's corruption

In fact (35) shows that O must raise to a higher (A-)position in order to control PRO, (36) that this process interferes with the otherwise possible binding of an anaphor by the understood subject.

Second, if O, in certain configurations like (37a), is able to control from its base position, when possessivized it will not need to raise through an A-position and a null syntactic subject will be available; indeed the latter may show its presence by itself performing as a controller:

(37) a. La condanna di Gianni a PRO scontare tre anni di carcere senza PRO avergli dato la possibilità di difendersi mi ha scandalizzato
The conviction of Gianni to serve three years in prison without giving him a chance to defend himself scandalized me
b. La sua condanna a PRO scontare tre anni di carcere senza PRO avergli dato la possibilità di difendersi mi ha scandalizzato
His conviction to serve three years in prison without giving him a chance to defend himself scandalized me

Here O controls the PRO subject of *scontare* 'serve' and the understood arbitrary S of *condanna* 'conviction' may control the other PRO subject of the adverbial *without*-clause. Hence both S and O are syntactically active.

Finally, if the only high A-position is the one of subjects, with 'unaffecting' head nouns, which it was argued cannot dispense with a syntactically realized S role (cf. 1.2.1.), hence at least an empty category, the object should never improve its control capabilities through possessivization. This prediction is also borne out:

(38) a. * Non è possibile la conoscenza dell'algebra senza essere studiata bene
Knowledge of algebra without being studied well is not possible
b. * Non è possibile la sua conoscenza senza essere studiata bene
Its knowledge without being studied well is not possible

Thus, the data suggest that even in languages admitting more than one external position, like e.g. Romance languages and German as parametrically opposed to English and Scandinavian (cf. 1.4.2.), only one of them counts as an A-position[8]. At the same time these patterns strongly reinforce the evidence for the role played by empty categories within nominal structures.

1.6. Some conclusions

To sum up, the argument structure of nominal phrases is governed by a number of probably universal *principles*, largely shared with clausal structures; among these, principles concerning:

(39) a. the structural hierarchy and obligatoriness/optionality of thematic arguments;
b. the existence of two distinct Case positions for non-prepositional arguments;
c. the access to such positions;
d. the licensing of empty categories.

The main domains of *parametric* variation in this area concern instead:

(40) a. the number of external argument positions;
b. the number of active Case-checking positions;
c. the actual forms of non-prepositional Case realization.

The setting of such parameters appears at first sight rather unrelated to the settings and even the structure of parameters in the clausal domain.

[8] Though, however, overtly realized Possessors seem to count as A-positions in some binding phenomena.

2. Modifiers

2.1. Adjectives

Attributive adjectives are traditionally an extensively covered but poorly understood domain of inquiry. Some generalizations began to emerge, however, in the most recent years, beyond the occurrence of much stylistically conditioned surface variation.

2.1.1. Types and order

The most salient property of adjectives reevaluated by recent work (Sproat and Shih 1988, Crisma 1991, 1996, Valois 1991) is that they receive different interpretations according to their syntactic position (also cf. Fassi Fehri 1997, Gil 1987). The lexical meaning of some adjectives is compatible with more semantic roles, accordingly allowing them to appear in different positions, that of some others is only compatible with one semantic interpretation, thus freezing their occurence in certain positions.

The existence of different positions is manifested, rather universally, in the relative linear order of adjectives with respect to each other, and, with some parametric variation, with respect to the head noun.

Sproat and Shih (1988) suggest that a preference hierarchy tends to order adjectives expressing more absolute properties, like shape and color, linearly closer to the head than those expressing relative properties, like quality and size. The hierarchy seems observationally well motivated in languages with steadily prenominal modifiers (e.g. English, Chinese), but yields contrasting results in different languages with superficially postnominal adjectives (within European languages, Celtic retains the same order of adjectives as English, but some non-European languages display its mirror image), and finally has unclear status in languages like the Romance ones, where nouns often surface medially between pairs or sets of adjectives.

Sharper and theoretically more revealing results were provided by including in focus the richer system of adjectival modification found with event nominals. The relevant facts suggest the existence of a fixed crosslinguistic left-to-right sequence of adjectives, paralleling that of adverbs discussed in Jackendoff (1972):

(41) S-(subject or speaker)oriented > Manner > Argument adjective (from Crisma 1991, 1993)

Some restricted classes of special adjectives (numeral ones and very few others) seem to even precede the sequence of (41) (Bernstein 1991, Crisma 1991, Zamparelli 1995).

Now, it has been stressed originally by Crisma (1991, 1993, 1996) and Valois (1991) that the head noun surfaces in different positions in different languages, without affecting the relative order of adjectives; cf. the following paradigms representative in turn of event- and object-denoting nominals (with the noun in bold):

(42) a. The probable hostile German **reaction** English (Germanic)
b. La probabile **reazione** ostile tedesca Italian (most of Romance)

(43) a. A nice blue German **dress**
b. One bèle bleuve **cote** alemande Walloon[9]
c. Un bel **vestito** azzurro tedesco

[9] The Walloon example has been adapted from Bernstein (1991).

The crucial observation is that, as mentioned before, each position corresponds to a distinct semantic role, and many adjectives are lexically able to bear different roles (somehow like the same DP may positionally bear different q-roles), giving rise to non-synonymous pairs like:

(44) a. L'astuta risposta ingenua di Gianni
b. L'ingenua risposta astuta di Gianni

(45) a. John's clever naive answer
b. John's naive clever answer[10]

2.1.2. Adjectives and N-raising

Bringing to light these patterns naturally supported the hypothesis that the parametric variation in question does not concern the position of adjectives but rather that of the noun (Bernstein 1991, 1992, 1993, Crisma 1991, 1993, 1996, Valois 1991, Cinque 1994), taken to leftward raise to different positions in different languages and constructions.

This N-raising approach to the noun-adjective order is a generalization of the narrower but parallel analysis proposed in Longobardi (1994) for the N-A order obligatorily found in Romance with determinerless proper names. Adjectives normally only possible in the D-A-N order but ungrammatical (or severely constrained in their meaning options) in the D-N-A order become grammatical (or retain their ordinary prenominal meaning) with proper names in the N-A sequence (and the A-N one is ungrammatical):

(46) a. La sola Napoli è stata prescelta tra le città italiane
The only(*sg. fem. adjective*) Naples was selected among Italian cities
b. * La Napoli sola è stata prescelta tra le città italiane
The Naples only was selected among Italian cities
c. Napoli sola è stata prescelta tra le città italiane
Naples only was selected among Italian cities
d. * Sola Napoli è stata prescelta tra le città italiane
Only Naples was selected among Italian cities

The paradigm suggests that N substitutes for D with the adjective remaining basically prenominal. It is perhaps significant that the Romance languages display both N-to-D raising of proper names and more general leftward N-raising over adjectives, while the Germanic ones lack both, though the question deserves wider typological investigation.

Another type of contrast concerning at least the so-called Manner adjectives and distinguishing Germanic and Romance in a way parallel to the patterns seen above is that between *restrictive* and *appositive* modification. With few exceptions, Romance adjectives are only appositive when prenominal; the Germanic ones can be restrictive or appositive:

(47) a. Il **vestito** azzurro
b. L'azzurro **vestito**

(48) The blue **dress**

---

[10] The possibility of coordinations like the following, in the intended reading, is on a par with those of fn. 4 above and suggests, again, that the linear ordering of such sequences corresponds to a regular right-branching structure:
a. The probable hostile [German reactions and Italian comments]
b. The probable [hostile German reactions and favorable Italian comments]

This contrast as well has been occasionally suggested to be ultimately reducible to the wider scope (i.e. higher target) of N-raising in Romance (Bernstein 1992, Zamparelli 1994, Crisma 1996). Crosslinguistically, so-called Manner adjectives would be split: the restrictive type might occur lower than the appositive one, with the noun obligatorily raising above the latter adjectives in Romance but not in Germanic. Given (41), this analysis suggests the (perhaps correct) prediction that S-oriented adjectives on one side and argument adjectives on the other should escape the classical appositive/restrictive contrast. (41) could then become (49), with w the potentially universal domain of restrictiveness and N the position normally targeted by raising of common nouns in most Romance varieties:

(49) [S-(subject or speaker-)oriented [Manner$_1$(appositive) N [$_w$ Manner$_2$(restrictive) [Argument adjective.....]]]]

On the whole, two main conclusions appear to have emerged from recent approaches to adjectival modification:

1) it is possible to profitably pursue a research program based on the idea that adjectives occupy universally fixed positions in the nominal structure with N parametrically taking different orders with respect to such positions;

2) attributive adjectives as a whole (i.e. the entire structure of (41) or rather (49)) crosslinguistically occur lower than a genitive position or higher than another genitive position: in other words (41) seems to always occur between the two slots (probably specifier positions) labeled GenS and GenO in (10), a typological conjecture strongly confirmed by a language where both genitives can be realized, such as German (cf. (9) above)[11].

Therefore, properly inserting (49) into (10), the more complete picture turns out to be like the following:

(50) [**1** GenS **2** [S-oriented [Manner$_1$ N [Manner$_2$ [Argument **3** [GenO [$_\alpha$ P [S [O ...N...]] $_\alpha$]]]]]]]

The interaction of N-raising with the lexical structures examined so far will be analyzed in chapter 4. below.

[11] The question arose whether prenominal adjectives are heads (i.e. complements to D or to each other) in the extended projection from N to D or rather full XPs occurring as specifiers of invisible functional heads (or even stacked specifiers of the noun itself). This problem turns out to be hardly decidable on empirical grounds. A reasonable and balanced suggestion was made by Bernstein (1993), attempting to treat the higher adjectives as heads and the lower ones as specifiers.

Part 2. Functional structure

3. Determiners

3.1. Types of determiners

Certain languages are known to introduce the vast majority of their nominal structures by means of one (and often *at most* one) item taken from the (closed) classes of demonstratives, articles, possessives, quantifiers or cardinal numerals. These five classes, each with peculiarities of their own, are all roughly identified already in traditional grammar and can rather well be defined in relatively obvious semantic terms. As a first approximation, such classes, which, as noticed, normally seem to be mutually exclusive, are collected, precisely on these distributional grounds, under the hyperonymic grammatical category of *determiners* and, as far as their surface location is concerned, in recent works have been variously assigned to the head or specifier position of a D projection.

Among other things, determiners seem to typically establish the definite/indefinite interpretation of the nominal and to often select between a mass or count reading of morphologically singular head nouns.

The underlying syntactic source of such elements has also been discussed, occasionally giving rise to important conclusions, as in the case of Bernstein's (1997) results about demonstratives and of the considerations discussed in 3.3 below. I will be primarily concerned with the D category and principles affecting its surface appearance and will touch on the various determiners only if relevant.

The role of the D head has been judged so characteristic, in particular since the influential work of Szabolcsi (1981, 1983, 1987, 1989, 1994) and Abney (1987), that it has come more and more generally to be viewed as the head of the whole nominal structure (hence a DP) and as taking NP as its complement (cf. Bernstein, this volume, for discussion). The following subsections will be devoted to reviewing some crosslinguistic generalizations and some parametrizations concerning the conditions of occurrence or omission of determiners.

3.2. Determinerless NPs

3.2.1. Arguments and non-arguments

Languages superficially appear to differ heavily in the possibility of omitting an overt determiner. However, various constraints on omission have been identified in the recent past. A first principle and a very characteristic feature of the crosslinguistic pattern is that languages seem to distribute in a 'subset' or inclusiveness hierarchy with respect to omission environments: in other words we can review the best known language types in a sequence progressively enlarging the class of environments allowing superficially determinerless NPs.

The most restrictive type seems so far to be best instantiated by French, at least among Indoeuropean languages. The pattern of determiner omission in French appears close to justify an influential proposal originally made by Szabolcsi (1987), later adopted in Stowell (1989, 1991) and Longobardi (1994), namely that a D position (and its projection) is only necessary for *argument* nominals and may often be dispensable for *non-arguments*. Such a principle has been formulated in forms such as the following[12]:

(51) DPs can be arguments, NPs cannot

Thus, French exhibits determinerless NPs as predicates, idioms, exclamations, vocatives, in addition to certain prepositional complements, but not in classical argument functions. Some non-

[12] On the 'closing' function of D for arguments also cf. Higginbotham (1983).

Indoeuropean languages might perhaps, at a very first look, be classed with French in the most restrictive type, namely Basque and Maori, and would deserve attentive study in this perspective [13].

The next macrotype of languages is exemplified by the rest of the Romance varieties and by most of Germanic. Such languages display exactly the same asymmetry between arguments and non-arguments exhibited by French, but only with respect to singular count nouns. In other words, in argument position some superficially determinerless NPs do occur but only if headed by a plural or mass noun. Such expressions, whose study was initiated in English by Carlson (1977), still a useful source of information, have come to be known as *bare nouns* (cf. Delfitto 1998 for updated discussion).

3.2.2. Bare nouns

Argument bare nouns are thus present in all the Romance and Germanic languages (with the noted exception of modern French), but, pending discovery of further languages possibly falling into the same class, we may safely divide the type into two subtypes, well distinct and, again, related to each other by a subset relation.

The two subtypes are instantiated at best by Romance bare nouns on the more restrictive side and by English bare nouns on the other, with the rest of Germanic probably patterning with English, in essentials, although further study of such languages may be required.

Romance and English bare nouns differ with respect to both

(52) a. syntactic distribution
b. semantic interpretation

The first difference essentially amounts to the fact that Romance bare nouns are confined to complement positions and excluded from preverbal subject positions, roughly displaying the lexically governed distribution of syntactic variables (wh-traces) (cf. Contreras 1986, Lois 1986, Longobardi 1994 among others), while the English ones occur rather freely in all argument positions. Especially since Contreras (1986) it has been speculated that such a distribution in Romance could precisely be due to the presence of an actual empty category as the invisible determiner.

The second difference has to do with the fact that Romance bare nouns can only receive an *indefinite* interpretation (often existential, sometimes generic but only in independently *generic* or *characterizing* sentences), analogous, in the same environments, to that assigned to NPs introduced by overt indefinite determiners (indefinite article, partitive articles) (cf. Casalegno 1987, Dobrovie-Sorin and Laca 1996, Longobardi 1998). English bare nouns, instead, in addition to exhibiting the same interpretive possibilities as the Romance ones, can also apparently occur as kind-referring names, i.e. as referential or definite generics, in argument positions of kind-level (in Carlson's 1977 sense) and of *particular* or *episodic* sentences:

(53) Tomatoes were introduced in Europe after 1492

In such environments Romance can only resort to DPs headed by overt definite articles:

(54) a. * Pomodori furono introdotti in Europa dopo il 1492
Tomatoes were introduced in Europe after 1492
b. I pomodori furono introdotti in Europa dopo il 1492
The tomatoes were introduced in Europe after 1492

[13] For Maori an important source is Pearce's (1997, 1998) work.

The two contrasting properties (52a and b) have been suggested to be parametrically tied to each other and to others discussed below (Longobardi 1994, 1996, 1998).

Anyhow, descriptively, what seems clear is that there is a rough hierarchy of inclusiveness ranking languages with respect to such phenomena:

(55) a. Languages with no bare nouns
b. Languages with *stricter* bare nouns
c. Languages with *freer* bare nouns

In all these languages singular count common nouns appear superficially determinerless only in non-argument function. In such non-argument functions the distribution of determiners is more idiosyncratic and detailed monoglottic and crosslinguistic study of even these well-known languages is still to be pursued.

3.2.3. Bare singulars

In several languages, probably the majority, however, even *singular count* nouns may occur determinerless in argument function. Let me descriptively call such entities *bare singulars*, crucially distinguishing them in this sense from bare nouns as defined above.

A first group of such languages assigns bare singular arguments exactly the same range of interpretations as are assigned to NPs introduced by an overt indefinite article in languages like English, German or Romance. In essence, in these varieties, such nouns are interpreted as (existential or generic) indefinites, as if they contained a corresponding understood article. Among the most notable such languages, one may apparently cite Icelandic, Welsh and Irish, Hungarian, Hebrew and Arabic, and probably Classical Greek in the varieties of Attic and Koiné prose. Now, it seems to be the case that all these languages, while they have independent overt morphemes with the interpretation of a definite article, lack any overt morpheme which could be identified with the indefinite article of Romance and most of Germanic. That this is not due to chance has been proposed by Crisma (1997) as part of a wider tentative generalization which may be rephrased as follows:

(56) No language exhibits any free variation between presence and absence of a determiner for nominal arguments

In other words, if a language has a lexical determiner with a certain meaning (say, the indefinite article), it must obligatorily use it to express that meaning (a synonymous determinerless construction is excluded). If shown to be correct, this will be an important crosslinguistic property of determiner systems, possibly related to some version of the Full Interpretation Principle.

Another type of languages allows all types of determinerless argument nominals, including bare singulars, corresponding to either a definite or an indefinite interpretation of Western European languages. Typical instantiations of this type are most Slavic languages or Latin. If (56) is correct, it follows that such languages will not have any definite or indefinite lexical article, but just some of the semantically more complex instantiations of the category of determiners mentioned in 3.1.1. above. The expectation seems to be fulfilled. Also, it seems to remain descriptively true that if a language allows bare singulars it allows bare nouns as well.

Thus we have another pair of language types in a subset relation to one another and to those of (55), so that a fuller picture may now be completed and rephrased as follows:

(57) a. Languages with no bare nouns (French)
b. Languages with *stricter* bare nouns (apparently the rest of Romance: Spanish, Italian...)

c. Languages with *freer* bare nouns (English and perhaps most of Germanic)
d. Languages with indefinite bare singulars (and only a definite lexical article: Icelandic, Celtic, Hebrew...)
e. Languages with ambiguous bare singulars (i.e. articleless languages: Russian, Czech, Latin...)

Notice that if crosslinguistic variation were indeed limited to the types of (57), then all such possible languages would be ordered in a full subset hierarchy, trivializing most acquisition issues.

3.2.4. Parametric approaches

Let us now examine this supposedly correct pattern from the viewpoint of a parametric theory. The difference between (57a) and the other types was tentatively but plausibly reduced by Delfitto and Schroten (1992), Delfitto (1993) to the impoverished number morphology of French nouns as opposed to the rest of Romance, therefore an independent morphological parameter; the semantic-syntactic differences between (57b) and (57c) were related by Longobardi (1994) to a salient Romance/Germanic contrast in the syntax of proper names, for which cf. 3.2.6. and 4.1.1. below.

The contrast of the first three types (57a-b-c) vs. the other two (57d-e) has not been successfully related so far to independently visible differential properties, except for the noted consequences of (55), i.e. the lexical absence of the indefinite or of both articles in (57d) and (57e) respectively. The same is true of the contrast between (57a-b-c-d) and (57e).

The relevant distinctions are centered around the notions of *definiteness* interpretation and of *count/mass* selection for morphologically singular nouns. Recall that with overt determiners these are both typical properties of the D-system. The terms *interpretation* and *selection* will be used throughout in this technical sense.

The fact that there seem to exist languages with just bare nouns but no languages with only bare singulars may suggest that there is a universally *unmarked* (mass/plural) vs. *marked* (sg. count) selectional value.

According to Crisma (1997), in certain languages determinerless arguments would be parametrically limited to the unmarked or *default* selection, in others they would have *extragrammatical*, i.e. just pragmatic, selection, including the possibility of the marked value, as if they were introduced by actual null articles (*extragrammaticality of count/mass* parameter).

Analogously, while in many languages there are just indefinite determinerless arguments, it is highly dubious that there exist languages with just definite determinerless arguments (e.g. the case of a language complementary to (57d) in the sense of having a lexical indefinite article and missing determiners exclusively understood as a definite one)[14]. If this generalization is correct, here too we have to do with an unmarked (*indefinite*) vs. marked (*definite*) interpretive value. Therefore, Crisma (1997) has proposed, again, that in many languages determinerless argument nominals would be limited to the *default* (i.e. indefinite) interpretive value, in others (the languages of (57e), of course, as opposed to those of (57d) and to all those lexically distinguishing two articles of the modern Western European type) their interpretation would be extragrammatical, i.e. the assignment

[14] This possibility has been tentatively and erroneously suggested in the literature only for a restricted group of areally contiguous languages, essentially varieties of Turkish, Persian and Indo-Aryan (Kramsky (1972), Porterfield and Srivastav (1988), Singh (1992)). Since in such languages bare mass/plural nouns are not necessarily definite but grammatically ambiguous, Crisma (1997) noticed that the supposed lexical indefinite article is likely not to mark indefiniteness, which would be extragrammatical as in type (57e), but rather non default selection, with mass/plural as the universal default selection for bare indefinites.

of an interpretation w.r.t. definiteness would be an essentially pragmatic process (*extragrammaticality of definiteness* parameter).

Thus, two main parameters seem to account for most variation affecting null determiners: ± extragrammatical selection, ± extragrammatical interpretation.

This hypothesis provides, among other things, a maximally restrictive theory of the *grammatical* strategies to non-contextually recover the interpretation of an understood determiner: according to it, UG would allow just one such strategy, namely the assignment of a default *indefinite* value. The strategy would be one and the same for two types of phenomena, which are thus theoretically unified: bare singulars of languages of type (57d) and bare plural/mass nouns of languages of type (57b), like the Romance ones (for (57c) cf. below). Similar considerations might extend to selection recovery: see fn. 14 above.

3.2.5. Contextual identification

In the previous sections we have examined cases of determinerless NPs whose licensing and interpretation are relatively independent of the grammatical environment surrounding the 'missing' D position. Several languages, however, exhibit interactions between the local (NP-internal) grammatical context and a full range of 'missing determiners', thus including nominals with bare singular heads.

There are at least three main cases of this type to be considered:

(58) a. Semitic Construct State
b. Saxon Genitive in Germanic
c. Scandinavian definiteness suffixes

The first construction has been very extensively covered in the recent generative literature, e.g. by Borer (1984, 1994, 1996), Ritter (1986, 1988, 1991), Fassi Fehri (1989, 1993), Siloni (1990, 1994), Hazout (1991), Ouhalla (1988, 1991, 1996: also on Berber), Shlonsky (1991), among many others (also cf. Carstens 1991 on Bantu languages), and has significant parallels in a genitival construction of the Celtic languages (cf. Duffield 1991, Guilfoyle 1993 and Rouveret 1995).

In these constructions a determinerless noun is obligatorily followed by a genitival DP and interpreted for definiteness in a way harmonic with the definiteness value of such a DP: in other words the +/-definite reading of the matrix nominal is contextually *inherited* from that of its subordinate. Such constructions all display some evidence of leftward movement of the (matrix) head noun, which in several cases has been plausibly interpreted as raising to an empty D position and by some scholars (especially cf. Borer 1994, Siloni 1994) as a necessary component of the semantic process of definiteness inheritance referred to above.

The second construction formally falls in either of the two first types of Genitive realization mentioned in section 1.3.3, depending on the language (English and Scandinavian in the first type, German in the other). From the viewpoint of interpretation, however, it appears to be unitary. As in construct state, no overt determiner may appear introducing such phrases, yet the definiteness value of the matrix nominal is not undetermined, but is likely to depend on the genitival DP. It is arguable (cf. Longobardi 1996 and references cited; also see Dobrovie Sorin 1998) that these constructions are variants of the same abstract pattern responsible for the previous subcase, namely construct state. The only difference would be the obvious fact that N-raising does not overtly take place, or at least does not overtly cross past the genitival argument in Saxon Genitive, so as to derive the characteristic Gen-N surface order, as opposed to the N-Gen one of construct state. If so, the interpretive mechanism might be the same, i.e. inheritance of definiteness, with a parametric difference lying just in two distinct types of null Ds, one overtly attracting the head noun (Semitic), the other not (Germanic).

Finally, in the Scandinavian languages, as is known, the unmarked expression of definiteness with common nouns consists of a morpheme suffixed to the head noun (and, in some varieties, homophonous, though without an obvious etymological relation, with the free morpheme presumably occurring in D and functioning as an *indefinite* article), as in the following Norwegian examples[15]:

(59) a. Boken/Huset
The book/The house
b. En bok/Et hus
A book/A house

Such a definiteness suffix cannot however be structurally assimilated to a real article, because it does not seem to occupy the D position. When an adjective is inserted, the difference between this suffix and a real article surfaces: 1) the suffix may (e.g. in Icelandic or archaic forms of Mainland Scandinavian) or must (in most other varieties and styles, except for Danish) cooccur with overt morphemes having a definite or demonstrative interpretation and apparently occupying the D position (the so-called *double definiteness* phenomenon); 2) the complex N+suffix obligatorily occurs lower than adjectives in all the languages:

(60) a. Den vidunderlige boken — Norwegian
The wonderful book-the
b. Frábæra bókinn (/Hin frábæra bók) — Icelandic
Wonderful book-the (/The wonderful book)

These arguments suffice to suppose that, while the indefinite morpheme does indeed occupy the D position, this is not the case for the definiteness suffix, which is then not to be confused with a real enclitic article of the type occurring e.g. in Rumanian (cf. Dobrovie Sorin 1987, Grosu 1988):

(61) a. Lupul
Wolf-the
b. Lup
Wolf

The difference is that the complex formed by N+suffix occurs first in the Rumanian DP, to the left of adjectives, hence in the normal position of determiners, and cannot be preceded by, say, a demonstrative or any other analogous determination:

(62) a. Lupul frumoas
Wolf-the beautiful
b. * Acest lupul frumoas
This wolf-the beautiful

Thus, while the Rumanian definiteness morpheme may be rather safely taken to occur in D, the Scandinavian one must occur in a lower position. This position is perhaps that labeled **3** in (10) above, since it must be lower than all adjectives and immediately to the left of a position for Genitive Case, as shown by the following phrases:

---

[15] Cf. Taraldsen (1990), Delsing (1993) and the various papers collected or cited in Holmberg (1992), among many others.

(63) a. Den vidunderlige boken hans — Norwegian
The wonderful book-the his
b. Frábæra bókinn hans — Icelandic
Wonderful book-the his
'His wonderful book'

In any event, Scandinavian suffixes positionally are not determiners, hence in one more case something crucially contributes to the definite interpretation of the nominal without lying in D. The same analysis has been persuasively applied to a rather analogous definiteness suffix occurring in Bulgarian (Gambarotto 1995).

In languages where definiteness is grammatically relevant (types (57a-d), determinerless argument nominals, whenever possible, are thus subject to either of two basic mechanisms of interpretation, i.e. recovery of a definiteness value (cf. Crisma 1997):

(64) a. *default* interpretation (indefinite)
b. definiteness *inheritance*, exemplified in the three subcases of this section

Now recall that identification of empty determiners seems to be necessary with respect to two properties: recovery of definiteness (except for languages (57e), of course), and recovery of the mass/count reading selection for singular nouns.

Recovery of the count/mass selection is likely to take place along perfectly analogous lines: apart from languages where it is extragrammatical i.e. pragmatic (types (57d-e)), it obtains only by either a *default* strategy (mass/plural) or an *inheritance* process: this has been argued for Saxon Genitive in particular (cf. Crisma 1997, Bernstein, Cowart and McDaniel *in press*) since in construct state languages the question is irrelevant, for they seem to independently fall into type (57d), i.e. have free selection.

Also, the main difference between Icelandic and the rest of modern Scandinavian (and Germanic in general) would precisely be that in Icelandic selection can be pragmatic, in the other cognate languages it is at least recovered by inheritance.

Structurally speaking the inheritance processes, though sometimes originating from an embedded argument, presumably in a Spec position, might probably always involve two heads, namely D and a lower one: in construct state overt movement of the definiteness feature via N-raising to D has been postulated (Borer 1994, 1996, Siloni 1994); Saxon Genitive has been argued to involve the covert analogue of the same process (Longobardi 1996); it is less clear whether the same could be argued for the Scadinavian process. Only notice that, if such inheritance process were somehow blocked by an intervening adjective, this would explain the obligatory recourse to the overt determiner *den* in Norwegian (63a) and, modulo the pragmatic nature of selection in Icelandic, the minimally contrasting possibility of (63b) in the latter language.

3.2.6. Proper names

In the previous section we have reviewed some generalizations and current hypotheses about the phenomenon of determiner omission with common nouns, i.e., semantically, nouns referring to kinds. Unlike common nouns, proper names, i.e. nouns intrinsically referring to single individual objects, may occur determinerless to a much wider typological extent. Except for Greek (and perhaps Albanian, to judge from Kallulli 1996), at least a subset of proper names, especially place names and names of months and days, seem to be allowed to make arguments without any determiner in all the best analyzed modern languages, including the ones ranked highest in the hierarchy (57).

A crucial discovery in this respect was that such determinerless arguments are by no means simplex structures and that, furthermore, they are not structurally homogeneous in all languages: testing the position of determinerless argument proper names with respect to various sorts of adjectives in Romance, Longobardi (1994, 1996) has shown that such names never occupy the same position as determinerless common nouns (e.g. bare nouns), but presumably surface in the D position, as an effect of N-raising to D (also cf. section 2.1.2. above for examples).

Actually, it was argued that several traditional semantic properties associated with object reference (e.g. transparency in intensional contexts, rigidity of designation) are indeed a necessary correlate of precisely this syntactic raising. The generalization in Romance can thus be formulated as follows:

(65) If N overtly moves to a phonetically empty D then it will be object-referring

Of course whether an individual noun may bear this interpretation (is 'proper') or not (is 'common') is a property of its lexical semantics.

Thus, in at least one well studied language group the lack of determiners with argument proper names cannot be imputed to the lack or emptiness of the corresponding syntactic position, i.e. D. Further typological support for such N-raising analysis of proper names has been recently proposed, on the grounds of subtler phonological evidence, from the study of Igbo (Niger-Congo) as well (Déchaine and Manfredi 1998).

As anticipated, however, these constructions are not crosslinguistically homogeneous: in English, and presumably in other Germanic languages, argument determinerless proper names seem to have the same structure as bare nouns, i.e. the head noun does not raise to D. Thus, in Germanic Adj+N appears as the surface order of either common or proper determinerless nouns, in Romance, with the subset of obligatory prenominal adjectives, Adj+N is the surface appearance of bare nouns, N+Adj+*t* is that of proper names, in argument position.

This necessarily led to the assumption of a parameter of D-strength: descriptively speaking, a lexically empty D is strong in Romance (overtly attracts object-referring nouns) but not, say, in Germanic.

Longobardi (1994, 1996) embedded this parametric hypothesis in what might be defined a 'topological' theory of the syntax-semantics mapping in DPs: there would be designated positions within DPs for the interpretation of the various elements, in particular the denotation of the whole DP, hence the referential properties of proper names, are read off D (also cf. Zamparelli 1995, Vangsnes 1996 and references cited for the development of theories of further interpretive properties of nominals in a framework of the same spirit). Therefore, object-referring expressions must end up in D, and must do so overtly if the latter is 'strong'.

The systematic association so discovered between certain referential properties and (movement to) the D position parallels the more visible and traditionally known holding between scope assignment to wh-operators and (wh-movement to) Comp.

N-to-D raising, however, is not the only way for a proper name to satisfy the 'strength' requirement of D. In Romance N-to-D often alternates, under dialectal and stylistic conditioning, with proper names introduced by an overt (definite) article. Furthermore, with many names, whose peculiarity is sometimes predictable on complex cognitive grounds, the article strategy is the only available one, and this seems to be the case for *all* proper names in those languages mentioned above like Greek.

Such articles of proper names seem to have an obviously impoverished semantic function and in a few languages also a special morphological form (Catalan, perhaps Frisian to judge from Ebert 1970). Borrowing a useful term from Vergnaud and Zubizarreta (1992), they may be termed *expletive*, since their role, like that of certain subject pronouns, appears to be essentially that of

relating a substantive lexical item (the name) to the functional position (D) where it could have been, but was not, moved.

What is relevant here is that, though expletive articles with proper names are attested even in the Germanic languages, i.e. without strong Ds, Art(+Adj)+N is an available, indeed the only available, alternative to N(+Adj)+*t* in languages which must satisfy a strong D.

Therefore, languages where articles are obligatory with *all* proper names can be tentatively viewed as languages with a 'strong' setting of the D parameter, but with an independent blocking of N-to-D raising, an hypothesis with far-reaching consequences (cf. section 4.1.2. below).

Another category of obvious object-referring expressions is represented by personal pronouns, thus one could expect them to behave like proper names, i.e. to overtly raise to D in Romance and to stay lower in Germanic. The first expectation, in agreement with the sketched topological theory of DP, interpretation is fulfilled; the second is not, since, surprisingly, pronouns are likely to surface in D in English as well, essentially in agreement with Postal (1969). So, while (66a and b) minimally contrast, (67a and b) are perfectly parallel:

(66) a. Roma antica/*Antica Roma (fu distrutta dai barbari)
b. Ancient Rome/*Rome ancient (was destroyed by the barbarians)

(67) a. Noi ricchi/*Ricchi noi...
b. We rich/*Rich we...

Taken together with the crosslinguistic lack of alternations with structures with expletive articles ('*The rich we/*I ricchi noi'), this fact might suggest that pronouns are universally available for base generation in D, thus escaping the effects of the movement parameter affecting proper names.

3.2.7. Empty determiners: arguments and non-arguments

So far, we have tacitly assumed the wide crosslinguistic validity of a principle like (51). We may now wonder whether it can be positively argued that this is correct. The evidence in this direction is at best subtle and the question constitutes an important domain for further inquiry.

Of course, (51) would be naively falsified by a huge number of superficially determinerless arguments were we not to assume the existence of empty determiners. Hence, part of the problem has to do with whether there is positive evidence for empty categories in D in some of the subcases discussed above.

A kind of argument of plausibility can be formulated as follows: the supposed empty determiners display some properties often attributed to empty categories in general. Thus, we have seen that the possibility of determinerless nominals in argument position seems to be subject to two conditions: the *licensing* of the structure (available in, say, Italian, but not in French) and the *identification* or recovery of some features of selection and interpretation usually expressed by determiners. Now, as noticed in Crisma (1997), this is reminiscent of the two analogous requirements proposed by Rizzi (1986) for empty categories. Furthermore, there is even some analogy between the three types of identification typologically available to missing determiners and those holding for empty pronominals: the *default* strategy could correspond to the assignment of an impersonal (e.g. arbitrary) interpretation, the *contextual* strategy reminds of the identification of empty subjects by verbal agreement in e.g. Romance *pro-drop* varieties, the *extragrammatical* (pragmatic) strategy is analogous to that of empty subjects in languages without verbal agreement, like Chinese or Japanese (cf. Jaeggli and Safir 1989).

Another type of longer known analogy between missing determiners and empty categories is provided by Contreras' (1986) cited observation that Romance bare nouns display a 'lexically governed' distribution, like certain empty categories, those deprived of intrinsic feature content,

according to Chomsky (1981). It is now suggestive that this happens precisely with the cases where the alleged empty determiner would have to be most deprived of intrinsic feature content (default selection + default interpretation).

Of course what is most relevant for (51) is asymmetries between arguments and non-arguments: as noticed, in languages like French, with not even bare nouns, the asymmetry is particularly clear. But also the other Romance languages provide highly suggestive evidence for (51): for two completely independent phenomena, lexical government for bare nouns (which might point to an empty D, cf. above) and N-to-D raising over adjectives of proper names, are mandatory precisely in argument function, but not necessarily for non-arguments (cf. Longobardi 1994), as exemplified by the following Italian predicates:

(68) a. Testimoni saremo noi
Witnesses will-be(1st person pl) we
b. Cinecittà è stata camuffata da antica Roma per il film
Cinecittà was disguised as ancient Rome for the movie

The coincidence of two unrelated sources of evidence is a strong argument for (51) in Romance, hence for language types (57a-b).
The question is more open for the other types of (57). Though the problem still deserves further attention, argument/non-argument asymmetries pointing to some validity of (51) have been discovered even in some of the most liberal types (i.e. +null article languages): e.g. certain lexical items, exactly like Romance proper names, seem to always occur in D (or crucially require an article) in argument position, but can appear determinerless in lower DP-internal positions as non-arguments. Thus they reproduce the N+Adj+*t* (or Art+Adj+N) vs. Adj+N pattern seen to support (51) in Romance. Among such items are some proper names, in particular the word for 'God', in varieties of Old English, apparently of type (57d)[16]. In addition, personal pronouns have been argued to occur in D in Russian (clearly type (57e))[17]. Albeit still fragmentary, this sort of evidence might suggest the possible universality of (51) and any sound research program should carefully look for it in other languages as well.

3.3 Two sources of determiners

A few tentative speculations are now in order about possibly different sources of determiners. Scattered across languages, in fact, we find slight clues of some distributional non-uniformity of this so far unified category.

That the definite article may basically occur higher than other determiners, probably in what is the D position proper, is suggested by at least two types of considerations:

1) in Hungarian, where the definite article may overtly cooccur with a prenominal genitive, it always precedes the latter while all other, numeral, demonstrative, or quantificational, determiners necessarily follow it (Szabolcsi 1994):

(69) a. A Péter könyve
The Péter's book-sg3pers
a. Péter minden könyve
Péter's every book-sg3pers

[16] Cf. Mustanoja (1973), Crisma (1997). Furthermore, argument/non-argument asymmetries in Hungarian, another language presumably of type (57d), were used by Szabolcsi (1987) to originally propose and motivate (51).

[17] Cf. Gambarotto (1995).

2) in Italian, alternations concerning definite articles and numeral determiners can be interpreted as suggesting that the latter have a lower base position than the former and raise to D if and only if no other determiner is present (e.g. cf. Crisma 1991):

(70) a. Tre suoi libri
Three his books
b. I suoi tre libri
The his three books
c. * Suoi tre libri
His three books

3) along such lines, it becomes possible to account for the difference between the Italian and English paradigms in terms of (obligatory) raising/ non-raising of numerals to D:

(71) a. * Three his books
b. His three books

To this the parallel contrast involving the universal quantifier may be added, where English again essentially behaves like Hungarian:

(72) a. Ogni suo libro
Every his book
b. * Suo ogni libro
His every book
c. * Every his book
d. His every book

In other words, the lack of overt determiner would necessarily overtly attract numerals and 'every' to D in Italian, but not in English-Hungarian. It remains to be seen whether this Italian/English contrast in raising to D is parametrically related to the more substantial one involving proper names discussed directly below. In any event, it seems that one can hypothesize the possibility of a head (or phrase?) crosslinguistically occurring lower than D and the GenS position but higher than the whole adjectival structure. Such a position (perhaps identifiable with Szabolcsi's 1994 Det° and Ritter's 1991 Num° head of Hebrew), might crosslinguistically be the base position of numerals and at least certain quantificational determiners, which would thus be distributionally distinguishable from definite articles.

4. N-Movement

4.1. N-to-D raising

4.1.1. The referentiality parameter: proper names, expletives, generics

Alternations apparently concerning the surface position of the head noun seem to be quite a widespread phenomenon in several languages. In many a case, for example, the head noun ends up as necessarily initial in the whole nominal phrase, presumably a DP, and is separated from at least some of its thematic arguments, if any, by other material. Since the leftmost position of the nominal phrase is often that of determiner-like elements, such N-first constructions have been typically analyzed as instances of N-raising to D. According to the conditions triggering these movements, at least (and perhaps, hopefully, at most) three types of N-to-D have been identified and are best exemplified by, in turn:

(73) a. Rumanian nouns with the enclitic article

b. Semitic construct state
c. Romance proper names

Descriptively speaking, here D appears to 'attract' N, i.e. to be 'strong' in Chomsky's (1995) terms. The question is what are the roots of strength, i.e. what triggers the movement, in the three cases.

As for (73a) (especially studied in Dobrovie-Sorin 1987, Grosu 1988, cf. examples (61)-(62) above; a partly analogous case might be provided by Somali, cf. Lecarme 1989, 1994), the trigger is likely to be plainly morphophonological, i.e. to lie in the consistently enclitic nature of the definite article, with no specifically syntactic strength.

Case (73b), to which an impressive amount of insightful literature was devoted (cf. the references in section 3.2.5. above), is not characterized by any corresponding segmental morpheme appearing to attract the head noun to D, i.e. the raised noun does not occur suffixed in any way. The most obvious correlate to this case of N-to-D is an interpretive one, i.e. the phenomenon of definiteness inheritance pointed out in section 3.2.5 above. A very plausible proposal, since at least Borer (1994), Siloni (1994), has been that N-to-D applies in Semitic construct state precisely to check the otherwise unspecified definiteness feature of the lexically empty D position [18]. Therefore, the strong feature of D seems here to be that of definiteness interpretation.

(73c) is more complicated: as was seen above, it concerns proper names (and a few semantically assimilated nouns: cf. Longobardi 1996) and is descriptively governed by generalization (65) repeated below:

(65) If N overtly moves to a phonetically empty D then it will be object-referring

Again, an interpretive property, object reference, seems to be ultimately responsible for this instance of N-to-D in Romance. In this latter case strength would reside in a referentiality feature of D. No relevant phonological consequence seems to arise (though phonological effects are precisely what makes the phenomenon detectable in other languages, according to Déchaine and Manfredi 1998)[19]. In addition to proposing generalization (65), Longobardi (1994, 1998) has argued that a D being 'strong' precisely in this sense (i.e. overtly attracting object-referring head nouns) typologically correlates with particular distributional and semantic properties of bare *common* nouns, namely those discussed for Romance (as opposed to English) bare nouns in section 3.2.2. above. In particular the following generalization has been proposed to hold:

(74) A language has kind-referring (i.e. referential generic) bare nouns iff D is not strong

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[18] Even in this case, however, in many languages with most lexical choices the syntactic fronting of the noun in construct state correlates with some detectable effects on the morphophonological structure of the noun itself, which could be attributed to the combination of the lexical entry of the noun with an exclusively prosodic (non-segmental) morpheme lying in D (cf. Ritter 1988). This might suggest that some abstract (occasionally neutralized in some languages or constructions) phonological trigger is in principle at work in all instances of overt N-to-D.

[19] Prosodic alternations on head nouns dependent on their use as object-referring expressions have been reconstructed for some stage of Proto-Indoeuropean by Lazzeroni (1997); at an historical date, variation in the position of the accent on the same word according to whether it is used as a common noun/adjective or as a proper name (and in other environments according to slightly different manifestations of an abstract scale of referentiality) are still sporadically documented for Greek and Aryan. These alternating forms are probably lexicalized as different entries at that stage, but might go back to a productive system in the prehistoric language. If this proposal is correct it may be the case that even this version of 'strength' of D correlates in principle with morphophonological effects/triggers, detectable in some languages, perhaps neutralized in others.

This latter generalization and the related parametric approach, executed in Longobardi (1994, 1998), thus, are able to unify the two classes of differences between English and Romance noticed in sections 3.2.2. (syntax of proper names) and 3.2.6. (syntax and semantics of bare nouns) above [20].

4.1.2. N over adjectives

Another source of parametrization noted above and discussed in Bernstein (this volume) concerns the noun's ability to move to the left of some or all its adjectival modifiers: while this is possible (or even necessary), though to variable extents, in certain language types (say, Romance, Celtic, Semitic), it is impossible, at least under normal stylistic conditions, in others, like Germanic, Slavic, and Greek (cf. Androutsopoulou 1995a). Thus, typologically, the portion of DP-internal structure which may host adjectives can be *transparent* or *opaque* to N-raising. For concreteness and just descriptively, suppose that an intermediate head, call it H, occurs to the right of the position of any possible adjective (it is essentially the position labeled **3** in structures (10) and (50) above) and is the maximal target of N-raising in certain languages (i.e. Hmax is an absolute barrier to N-raising).

Recall (cf. section 3.2.6.) at this point that a strong D in the sense of (65) forces proper names either to raise or to be introduced by an expletive article (often morphologically neutralized with the definite form). Now, it is plausible to expect N-to-D to be blocked in languages where Hmax is otherwise a barrier to N-raising (i.e. common nouns do not cross over adjectives). Therefore the following conditional should follow as a theorem:

(75) Strong D + barrierhood of Hmax => obligatory expletive articles with all proper names

Also recall, then, that a strong D, according to (74), is manifested, among other properties, by the impossibility of expressing referential generics by means of bare nouns. Among the languages cited above with rather steadily prenominal adjectives, there is only one where bare nouns seem never to be kind-referring, i.e. Greek. Greek might thus have the conjunction of strong D and barrierhood of Hmax. It is then highly significant that Greek also displays the noted peculiarity (cf. section 3.2.6.) of requiring the article with all proper names. This empirical result confirms the correctness of (75) in a straightforward way, explaining an apparently curious property of Greek proper names as a consequence of deep principles and parameters of UG.

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[20] As anticipated in section 3.2.4., this parametric approach, extending to the distributional properties of bare nouns (cf. 3.2.2.), allows one to treat the two classes of languages (57b and c) as just one and the same with respect to parameters licensing determinerless NPs, their contrast independently following from the strong/weak nature of D. Other consequences of the proposed single parametric difference arise in interaction with specific assumptions about Case theory (Longobardi 1996). In particular it has been proposed that only languages where D is weak allow for genitives to superficially precede the head noun, as e.g. in Germanic Saxon Genitive. In languages where D is strong it must actually attract the noun in order for Genitive to be checked in the high (GenS) position (essentially construct state), except for possessives agreeing in features with the noun itself. On the complex question of Genitive checking also cf. Dobrovie-Sorin (1998) and Pearce (1998).

4.2. Raising to intermediate positions

4.2.1. Other functional heads

In the previous section, at least one intermediate functional head between D and N has been tentatively hypothesized as a target for N-raising. Whatever the correctness of that particular hypothesis, a number of proposals of the same spirit have been made in the literature (cf. Bernstein 1991, 1993, Picallo 1991, Ritter 1991, Zamparelli 1995 among many others). Three main types of evidence allegedly manifesting such heads were brought to support these claims:

(76) a. landing sites for N-raising [21]
b. occurrence of overt (usually clitic [22]) morphemes
c. realization of specific semantic features (e.g. number, gender, deixis...)

Of course, the most convincing evidence can only be provided by the combination and convergence of these types of argument, e.g. by showing that N-raising to a certain position systematically alternates with an independent realization of a specific morpheme, hopefully identifiable with the expression of a particular semantic feature. A sound research program of this type has been systematically pursued only in J. Bernstein's groundbreaking work (cf. Bernstein 1991, 1993 and this volume) on Walloon in comparison to other Romance languages, with some encouraging results.

Owing to reasons of space and competence, I will limit myself here to consider the evidence supposedly provided by N-raising, which is summarized in (77) below, essentially a generalization of the structures arrived at in (10) and (50) above:

(77)

[**D** [GenS [Num [**H1** [S-or [M_1 **H2** [M_2 **H3** [Arg **H4** [GenO [$_\alpha$ P [S [O ...**N**...]]$_\alpha$]]]]]]]]]

(77) must be understood according to the parametric specifications (78) and the lexicon (79):

(78)

-In languages like English N is likely not to reach H4
-In the rest of Germanic, Greek, probably Slavic, N reaches H4 and nothing further[23]

---

[21] It has been assumed throughout that rules fronting N within the DP are instances of head movement, necessarily landing into head positions. Fronting of N as part of instances of phrasal movement has also been postulated, e.g. in Androutsopoulou (1995b), Kayne (1994), Sanchez (1995, 1996), Bernstein (1997), Bhattacharya (1998). These hypotheses will not be reviewed here, owing to space limits.

[22] To my knowledge, in European languages, the supposed intermediate functional heads, unlike those found in the clausal domain, do not appear as free stressed morphemes. The fact deserves an explanation as well as the observation that only one nominal Case, Genitive, normally corresponds to both Nominative and Accusative (Benveniste 1966) (the latter fact does not seem to necessarily hold in all languages: cf. Chung 1973 and Pearce 1998 on Polynesian). Taken together, they could suggest that an intermediate head of nominals is more an extension of some features of N than an independent category like the semantically more complex ones selecting verbs in clauses. This 'nominal' character might perhaps be also warranted by the ability to license an extra argument of the noun, if the hypothesis made in 4.2.2. below were correct.

-In Romance, Celtic and Semitic N reaches the various higher heads (from D to H3) according to languages and constructions

(79) A lexicon for (77)**:**

D= determiner position, target for Romance proper names, Rumanian common Ns with the enclitic article, Semitic construct state Ns
GenS= position of construct state Genitive, perhaps unmarked Romance possessive As
Num (unless to be collapsed with H1)= base position for numerals and in many languages for other determiners different form the definite article
H1= perhaps target for Sardinian (cf. Bernstein, this volume) and Celtic nouns, and Semitic non-construct nouns
S-or= Subject- or Speaker-oriented adjective
M_1= Manner1 adjective
H2= target for common Ns in most Romance varieties
M_2= Manner2 adjective
H3= target for Walloon Ns
Arg= argument adjective
H4= position of Scandinavian (and Bulgarian?) definite suffixes and target for N-raising in German, Greek, Slavic, Scandinavian suffixed nouns...
GenO= position of postnominal Genitive
P, S, O= base position for Possessors, External and Internal arguments, respectively
N= base position for Ns
α= phrase (perhaps Nmax) including N and its arguments

In (77) four intermediate heads are indicated as potential targets for N-raising. However, no individual language provides evidence for more than one of such heads, at least on the grounds of N-movement, so their number actually results only from a comparative perspective[24]. It would thus be possible to describe nominal structures in terms of an autosegmental system, with the head sequence made available by UG only consisting of D-H-N, and the realization of the intermediate head H parametrically linked to crosslinguistically different positions in the universally fixed sequence of adjectives and genitival positions assessed above (in (50) and (77)).

In other words, the relation between H and the sequence of adjectives might be that between the following two (possibly universally ordered) levels, with a four-valued linking parameter (or two binary ones):

(80) a. [D [GenS [H [GenO [N]]]]
b. [S-oriented A [Manner$_1$ A [Manner$_2$ A [Argument A]]]]

The linking module would consist of the crosslinguistic condition (81) and the parametric statements (82):

(81) Only H may be linked *inside* the sequence (80b)

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[23] The main motivation to distinguish English from these other languages lies in the fact that English, unlike, say, German, does not show evidence that the noun ever raises to the left of an argument checking Genitive in the GenO position.

[24] In other words, language-internal alternations concerning the surface appearance of N among the various positions labeled H in (77) are likely not to exist .

(82) a. The default value is for H to be linked to the extreme right of (80b) [25]
b. The typologically attested linking positions for H are immediately before Argument A, Manner$_2$ A, or S-oriented A

4.2.2. Definiteness suffixes and strength

Let us now consider other crosslinguistic properties of the intermediate head H. To my knowledge, in the best known languages it is never realized as an independent free (non-clitic) morpheme, and there is no evidence for it as an empty category not targeted by N-movement (like, e.g., the empty D hypothesized for certain bare nouns). In other words its visibility is always a function of its being 'strong' with respect to N-raising. Except for this fact, H bears some analogy to D. For in some varieties it appears as an overt clitic morpheme, e.g. the Scandinavian definiteness suffix, to which N adjoins. In other languages it is only signalled as the landing site of N. These recall the two main subtypes of N-to-D (cf. (73)), to an enclitic article or to a segmentally null head[26].

As with (73a), the strength of H in the first subcase can be easily taken to be of a morphophonological nature, attracting N to satisfy its enclitic properties. A more interesting question arises for the second subtype: is there an independent manifestation of the strength properties of H, here? Notice that in the Romance-Germanic domain the languages displaying this subtype of movement are likely to be all the Romance varieties (N crosses over at least some adjectives) and German (N crosses over genitives), as opposed to Scandinavian, essentially displaying the first subtype (enclitic suffixes), and English, providing no evidence for N-movement. This distribution reminds of that noted in 1.4.2. for the possibility of licensing more than one external argument position, allowing Possessors or raised Objects to cooccur with Subjects. It is plausible, then, that the two phenomena are parametrically related. The possibility of projecting an extra position for arguments would be contingent on the presence of a *syntactically* strong (not just phonologically clitic, given the patterning of Scandinavian) H.[27] If this tentative line of reasoning is correct, then one of the parameters left open at the end of section 1.6. can be eliminated and reduced to the independent existence in the language of such a strong H.

4.3. Conclusions

It is now possible to sum up a few principles and parameters of DP structure discussed along this review.

To the potentially universal principles pointed out in (39) of section 1.6. above, after examining the argument structure (repeated below as (83a-d)) at least (83e) must be added:

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[25] If (and only if) H happens to be linked to the default position, it may be assumed to universally project a barrier to N-to-D in the sense relevant for section 4.1.2.

[26] Other less parallel properties of H with respect to D can derive from the different semantic features constituting the two categories (also cf. the remarks of fn. 22).

[27] Under this hypothesis the scheme (77) has to be further slightly revised to better accommodate the external argument positions: a plausible attempt is the following, with the extra P position (in parentheses), here conventionally marked next to each potential location for H, only available if the latter is strong:

[**D** [GenS [Num [(P) **H1** [S-or [M_1 [(P) **H2** [M_2 [(P) **H3** [Arg [(P) **H4** [GenO [$_\alpha$ P/S [O ...**N**...]]]$_\alpha$]]]]]]]]]]

Of course, if this extra Possessor argument surfaces as a postnominal prepositional genitive phrase, the thematic position so projected may be actually occupied by a pronominal empty category, linked in a chain to the lower PP, rather in the way discussed for (25) above.

(83) UG Principles:

a. the structural hierarchy and obligatoriness/optionality of thematic arguments
b. the existence of two distinct Case positions for non-prepositional arguments
c. the access to such positions
d. the licensing of empty categories
e. the hierarchy of adjectival and Case-checking positions (cf. (77))

As could be expected, most of the overall parametric variation concentrates in the functional structure rather than in the lexical one. In addition, one of the parameters identified in (40) of section 1.6. has been tentatively reduced to a parameter of functional structure in 4.2.1. The main parametric dimensions identified can thus be summarized as follows, with a rough estimation of the number of binary parameters minimally necessary for each dimension in brackets:

(84) Parameters:

a.	about the number of active Case-checking positions (cf. 1.3.2.)	(2)
b.	about the actual forms of non-prepositional Case realization (cf. 1.3.1)	(2)
c.	about overt realization of D (cf.3.2.4.)	(3)
d.	about the position of H (4.2.1.)	(2)
e.	about syntactic strength of D and H (cf. 3.2.6. and 4.2.2.)	(2)
f.	about enclitic status of D and H	(2)

On the whole, it is not too hazardous a guess to expect that the order of magnitude of core grammatical variation in the DP domain may ultimately turn out to be roughly equivalent to something between 15 and 20 binary parameters, perhaps even including intrinsically morphophonological parameters like (84b) and (84f).

Finally, it must be recalled that a substantial number of problems are still to be addressed theoretically and typologically. Among them at least a few seem to be worth mentioning: for example, are there really languages with phrase-final D and other mirror-image phenomena (e.g. cf. Williamson 1987, among others)? And, if so, how are they to be treated? Why most languages seem to display only one type of Case (Genitive) for arguments of nouns as opposed to normally dual Case systems (Nominative/Accusative, Absolutive/Ergative...) for clauses (also cf. fn. 22)? Last, but of the highest importance, is the question of the universal or language-particular validity of a condition like (51), a problem to which detailed and promising attention has recently begun to be given even outside the domain of the best studied European languages [28].

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[28] Especially see Carstens (1991) on Bantu, Cheng and Sybesma (1997), Li (1997), Del Gobbo (1999) about Mandarin and Cantonese, among several others. Also cf. Pearce's (1997, 1998) series of works on Maori DPs.

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