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Categorial feature magnetism: The endocentricity and distribution of projections

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Abstract. The question addressed here is whether there is a systematic relationship between the internal structure of syntactic phrases and their distribution in the clause. To account for the internal coherence of syntactic phrases, their endocentricity, I develop the notion of 'extended projections' in two ways. First, evidence from two constructions of German and Dutch argues that in addition to lexical heads and functional heads, also semi-lexical heads must be introduced. The notion of categorial identity, which states that the syntactic nodes connecting the lexical and functional heads within an extended projection with the phrasal node must all be of the same category type, is shown to hold for semi-lexical heads as well. Second, the notion of 'extended projection' will be modified to accommodate the fact that prepositional elements can often be inserted within an extended projection. This exceptional status of prepositional elements is reminiscent of the fact that prepositional phrases are arguably the most flexible phrases in terms of their distribution. In earlier work, I had suggested that this fact could be expressed in terms of a constraint, the Unlike Feature Constraint, which was formulated in terms of repulsion between the positive values of the categorial features: a [+N/V] head does not tolerate a [+N/V] phrase in its immediate domain. Categorial identity is now interpreted as the mutual attraction of the positive categorial feature values: we have attraction within, but repulsion across phrasal categories. And in both cases, prepositions are the neutral element. This idea leads to a unified principle, the Law of Categorial Feature Magnetism.

1. The problem[1]

When X-bar theory was introduced in generative grammar, it was designed to capture two major ideas. One was the belief that complements, that is

[1] This paper was first presented at Tsuru University on May 24 1996. An early version of the paper is to appear in the Tsuru University Working Papers as Van Riemsdijk (forhtcoming). It was also presented to audiences at Meiji Gakuin University in Tokyo, Kanda University in Chiba, and Tohoku Gakuin University in Sendai. Many thanks to my hosts in these various places: Takashi Imai, Shigeo Tonoike, Joe Emonds and Nobuko Hasegawa, and Masayuki Oishi, as well as to the respective audiences for their stimulating comments. Special thanks are due to Takashi Imai for his generous support without which my lecture tour to Japan would not have been possible. After Japan, sections of the paper were presented at the Rabat GLOW conference in March 1997, at the workshop in Ybbs in July 1997 and at a conference in Sofia in September 1997. Thanks are due to these various audiences as well as to my respective hosts, Christine Czinglar and Martin Prinzhorn, and Iliyana Krapova and Mila Dimitrova-Vulchanova, and to Ken Safir and three anonymous referees for thoughtful comments.

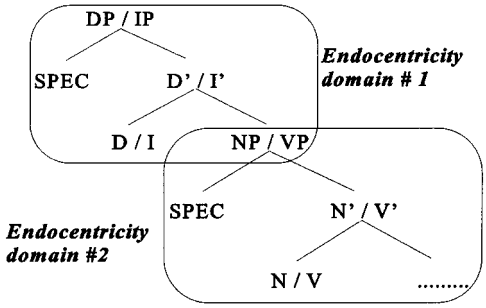
lexically selected phrases, are internal, closer to the head than modifiers, specifiers, adjuncts or whatever other dependents there are in a phrase. The second was the concept of *endocentricity*, the idea that there is an intrinsic connection between the categorial status of a head and that of the phrasal node characterizing the phrase that it is the head of. The first of these is problematic in certain ways, but that is not the topic of the present article.[2] The second one is in dire need of reexamination in view of the introduction into the theory of phrase structure of functional heads. This is the first topic I wish to address here, and the topic which will occupy the bulk of the paper.

The second topic, which I turn to in section 5, discusses the conceptual status of one of the two principles which are central to the solution to the endocentricity problem, the Categorial Identity Thesis (CIT), of which a revised version is proposed in section 4. I will argue that the CIT can be linked with the Unlike Feature Condition (UFC), which regulates the contexts in which phrases can and cannot appear. This link results in the postulation of a unified principle, the Law of Categorial Feature Magnetism (LCFM).

Take the notion of noun phrase. Until the introduction of functional heads in the eighties, the situation was simple. There was one lexical head, N (N°), and there was one containing phrasal node, NP or N^{max}. Endocentricity says that a head N can only exist if it heads an NP, and that an NP does not have an independent existence if it is not headed by N. This will exclude N heading AP, NP being headed by P, etc. This is endocentricity in its pure form, and X-bar theory was well-designed to formalize this notion in an adequate way. However, work in the late seventies and early eighties has resulted in the realization that determiners are also head-like. And in the wake of that first step, the number of these so-called functional heads has multiplied. In the nominal domain, in addition to D (for Determiner), we have Q (for Quantifier), K (for Kase (= case)), CLASS (for CLASSifier) and many others. In the verbal domain, there are even more candidates: I (for Inflection), TNS (for Tense), AGR (for AGReement), NEG (for NEGation), ASP (for ASPect), T (for Topic), CL (for CLitic), and many more. But let us, for the sake of simplicity, stick to the minimal addition of one functional head: D, to the noun phrase, and I to the verb phrase. The standard line of reasoning is that since functional heads are (correctly) identified as heads, X-bar theory must apply to them in full. This leads to something like the following structure for the noun phrase (or, to the right of the slash, the VP/IP):

[2] See Van Riemsdijk (1993). The issue is closely linked with that of the proper analysis of scrambling. If (the neutral form of) scrambling is best analyzed as base generation, as I believe, then the strict separation of complements and adjuncts must be removed from X-bar theory. See various contributions to Corver and Van Riemsdijk (1994) and Corver and Van Riemsdijk (1997).

(1)



Each head has its own projection, its own specifier, its own maximal projection node. The relation between D/I and NP/VP is one of selection in very much the same way that verbs select noun phrases, prepositional phrases or clauses. With further multiplication of functional heads, the number of specifiers is multiplied as well. In many cases it is not clear what role these specifiers play, if any. Another way of putting this is to say that the definition of 'specifier' was never entirely clear in that, for example, it subsumed such categorially and otherwise diverse elements as articles, quantifiers, modifiers, subjects, etc., and while in more recent work heads have been more or less successfully separated from XPs, the confusion remains with respect to the status of negation, adverbs and the like (cf. Cinque (to appear), Zanuttini (1997) and others for discussion). But the most distressing aspect, perhaps, is that endocentricity is no longer defined in the way in which it should be. What should be expressed is that endocentricity holds between N and DP, and between V and IP. But not only is this not visible in the choice of category labels, more importantly it is formally inexpressible because there are two projections, the N/V-projection and the D/I-projection, each with their own maximal projection node, NP/VP and DP/IP respectively. Hence, endocentricity holds within each of these, but not for the structure as a whole.

In the literature, this problem has been recognized to a certain extent. Most researchers acknowledge that the relationship between a functional head and 'its' lexical projection is, in a certain sense, unique. That is, D goes with N, just as I goes with V. The question is what can be done to express this priviledged relationship between functional and lexical heads. In fact, it is not obvious that one wants to express that relationship in terms of selection in the first place. After all, selection between lexical heads and their complements, the prototypical case of selection, generally involves a choice. That is, if a verb takes a complement, we must know, and at least to a certain extent stipulate in the lexicon, what the categorial status of its complement is: DP, PP, or IP/CP. Within the DP, however, D always takes an NP, just as I alsways takes VP. And with a richer functional articulation of these phrases, the biunique relationship between a functional head and the functional phrase

it 'selects' in reality takes the place of a template in which the order of the functional elements is stipulated.

The most influential attempt to remedy the situation so far has been the Grimshaw (1991) proposal to introduce the notion of 'extended projection.' Central to Grimshaw's proposal is the insight, independently arrived at in Van Riemsdijk (1990), that the essential property that ties lexical projections and 'their' functional heads together is categorial identity. The idea is quite simple. To the extent that we can say anything about the categorial status of D, it is that D is nominal. That is, either determiners are elements *sui generis* or they are pronoun-like. Similarly, to the extent that inflectional elements are at all categorially identifiable, they show up as (auxiliary) verbs.[3] I dubbed this generalization the Categorial Identity Thesis (CIT).

(2) **Categorial Identity Thesis**: In the unmarked case the lexical head and the corresponding functional head have the same categorial features.

What my (1990) paper was mainly about was the extrapolation of the CIT to prepositional phrases.[4] The argument was, quite simply, that if the CIT holds, and if there are functional heads in the prepositional domain, then those functional elements must themselves be prepositional in nature. Evidence for this extrapolation is found in German circum- and postpositional constructions of the following type:

(3)	auf den Berg hinauf	on the mountain up	acc
	hinter der Scheune hervor	behind the barn from	dat
(4)	den Berg hinauf	the mountain up	acc
	meiner Meinung nach	my opinion according-to	dat

The circumpositional phrases are argued to consist of a lexical preposition, followed by the DP complement, followed by the functional prepositional element (which can also host the [±approximative] deictic particles *hin-* and *her-*. The postpositional PPs can then be taken to involve movement of the

[3] Negation is an interesting case. If negation is a functional head, then elements like *not* must be analyzed as highly degenerate verbs. While not directly supported for languages like English, there is interesting confirmation of such a hypothesis in languages like Finnish, where negation is an auxiliary verb that is conjugated for person and number.

[4] A further extrapolation, only mentioned in passing in the 1990 article, is to say that the functional nodes typically associated with adjectives must then be adjectival as well. While this may well be the correct analysis for degree phrases, I have not come across any cogent or suggestive evidence so far, therefore the matter has been left open.

lexical preposition into the functional postpositional slot.[5] For more details, the reader is referred to Van Riemsdijk (1990).

Grimshaw incorporates the CIT in the following way. She proposes to distinguish between 'perfect projections' and 'extended projections.' She defines these notions as follows.[6]

(5) **Grimshaw's system**

A. Categorial specifications:

V	[+V, −N]	(F0)	(L0)
V′	[+V, −N]	(F0)	(L1)
VP	[+V, −N]	(F0)	(L2)
I	[+V, −N]	(F1)	(L0)
I′	[+V, −N]	(F1)	(L1)
IP	[+V, −N]	(F1)	(L2)
N	[−V, +N]	(F0)	(L0)
N′	[−V, +N]	(F0)	(L1)
NP	[−V, +N]	(F0)	(L2)

[5] Thus, the first example in (4) would have the following structure:

(i) $[_P$ e $]_i$ den Berg hin + $[_P$ auf $]_i$

It should be noted, however, that there are several ways in which such circumpositional structures could arise. Another one, much in line with Kayne's (1994) proposals, would be to say that you start with (ii) and derive (iii) by raising the DP.

(ii) $[_{PP}$ $[_{SPEC}$] hin- $[_{P'}$ $[_P$ auf] [den Berg]]]
(iii) $[_{PP}$ $[_{SPEC}$ [den Berg $]_j$] hin-$[_P$ auf $]_i$ $[_{P'}$ $[_P$ e $]_i$ [e $]_j$]]

In the present article I have tried to keep things as robust as possible by avoiding matters of movement as much as possible.

[6] L is here conceived of as a ternary feature serving to distinguish the main projection levels. See the next section for an alternative in terms of binary features. And F is here a binary feature which serves to distinguish lexical nodes from functional ones. Potentially, however, F could also be an n-ary feature to distinguish several levels of functionality. But in the present article I will adopt two binary features to accommodate such an extra level for semi-lexical categories.

A referee notes that it is a disadvantage of any analysis in terms of the two category features [±N] and [±V] that adverbs cannot be given a place in the system. I actually believe this to be an advantage in that I take 'adverb' to be a purely functional notion, adverbials being categorially expressed by APs, PPs, NPs and (extended) VPs. On such a view, the *-ly* of adjectival adverbs is a flectional element which serves to mark adjectives which do not entertain an agreement relation and hence are adverbially used.

D	[−V, +N]	(F1)	(L0)
D′	[−V, +N]	(F1)	(L1)
DP	[−V, +N]	(F1)	(L2)

B. Perfect projection:

x is the *perfect head* of y, and y is a *perfect projection* of x iff:
(a) y dominates x;
(b) y and x share all categorial features;
(c) all nodes intervening between x and y share all categorial features;
(d) the F value of y is the same as the F value of x.

C. Extended projection:

x is the *extended head* of y, and y is an *extended projection* of x iff:
(a) y dominates x;
(*b*) *y and x share all categorial features*;
(*c*) *all nodes intervening between x and y share all categorial features*;
(d) if x and y are not in the same perfect projection, the F value of y is higher than the F value of x.

The italics in Cb/c indicate the way in which the CIT is incorporated in this system. Given this definition, endocentricity can be reformulated as a property holding of extended projections rather than perfect projections.

My main objection to this solution is that it achieves its result largely through a stipulation that is independent of the formalism of X-bar theory. While the two endocentricity domains of (1) can now be united under the notion of extended projection, one may wonder to what extent the notion of perfect projection plays any kind of significant role at all.[7] What sense does it make, for example, to call the node NP a maximal projection node? And do we really need two specifiers?[8] I believe that the proposal I made in the

[7] One potentially significant point that comes to mind is the restriction on possible landing sites for adjunction proposed in Chomsky (1986). The so-called structure preserving theory of movement states that maximal projections can be adjoined to maximal projection nodes only, and heads to heads only. This theory faces two problems, however. First, with the multiplication of functional heads and their maximal projection nodes, the restriction loses much of its empirical force. Second, there are constructions that seem to indicate that movement of non-maximal constituents is possible, cf. Van Riemsdijk (1989).

[8] Grimshaw acknowledges the latter question in a note on p. 4 of her paper, but she suggests that perhaps only the lexical perfect projection should have a specifier even though most

(1990) paper solves these problems in a more principled way. Furthermore, I am not fully satisfied with the way in which Grimshaw treats PPs and CPs as extensions of DP and IP respectively, an issue which I will return to below. Therefore, I wish to take up again my original proposal and to elaborate certain aspects of it that I did not address at the time.

2. (M-)Projections

The conception of X-bar theory sketched in Van Riemsdijk (1990) is consonant with Grimshaw's system to the extent that the CIT plays a central role in defining an (extended) projection. But it differs from it in that it dispenses with the notion of perfect (or: non-extended) projection. That is, I assume that there cannot be any maximal projection nodes inside a projection. Conceptually, the main impact of this difference is that Grimshaw's system maintains the biunique relation between head and projection in full, that is for every type of head. On my own view, this biuniqueness does hold, but only at the level of lexical heads. In other words, there is exactly one lexical head per projection, but a projection may contain several heads: one lexical and the others functional. For this reason, this alternative conception of 'projection' has come to be called macro-projection by some. But since I do not assume anything like a micro-projection, I prefer to simply use the term projection, keeping in mind that they are defined differently. Where it is necessary to keep the two competing definitions strictly separate, I will use the term M-projection, where M, if anything, could be taken to stand for 'minimal' rather than 'macro-'.

The idea that there can be more than one head within a single projection is by no means new. It can be traced back at least to Emonds' work which started in the late seventies and was developed in great detail in later works, to which my own thinking about these issues owes its greatest intellectual debt.[9] Where I have M- and E-projections (see below), Emonds speaks of flat structures. Furthermore, Emonds relies on a generalized mechanism of subcategorization where I prefer to distinguish the classical case of subcategorization from other head-head dependencies which I refer to as agreement rather than subcategorization. A full scale comparison of the two approaches is beyond the scope of the present article, however.

To be more explicit, I will adopt the following definitions from the (1990) article, partly adapted to suit my current purposes. With Grimshaw, I assume that projections are defined in terms of three subsets of features

researchers would agree that there is a close connection between a specifier and a functional head in terms of specifier-head agreement.

[9] See Emonds (1978, 1985, 1987, 1994, forthcoming), among several others.

characterizing heads and projection nodes: C(ategorial) features, L(evel) features and F(unctionality) features. Rather than adopting a ternary (or n-ary) L-feature, however, I will stick to the binary features M(AXimal) and P(ROJected) as proposed in Muysken (1983) because they naturally define a projection in terms of a bottom node, the head, a top node, the maximal projection node, and any number of intermediate nodes that are not formally distinguished from one another.

(6)

C-features: [±N], [±V]	[+N, −V] = N, D, Q, . . .
	[−N, +V] = V, I, AGR, . . .
	[+N, +V] = A, DEG, . . .
	[−N, −V] = P, FP, . . .
L-features: [±PROJ], [±MAX]	
	[−PROJ, −MAX] = head (H°)
	[+PROJ, −MAX] = intermediate node (H′)
	[+PROJ, +MAX] = max. proj. node (HP or H^{max})
	([−PROJ, +MAX] = unprojected particles)
F-features: [±F]	[−F] = lexical node
	[+F] = functional node

We can now formulate two main well-formedness conditions, the **CIT** which we have already encountered, and a new one which I will call the **No Value Reversal Condition** (NVR). In terms of these, the notion of projection can then be straightforwardly defined.[10] For the sake of completeness, a third well-formedness condition is added to these, a condition (**PAM**) which says that phrases must always be maximal.

(7) Well-Formedness Conditions:

a. **Categorial Identity Thesis (CIT)**:

Within a projection, the values for the C-features must be uniform.

[10] There is an implicit additional pair of conditions here having to do with the uniqueness of heads and maximal projection nodes. These can be stated as follows:

(i) *H° | H° or: *[−PROJ] unless dominated by [+PROJ]

(ii) *HP | HP or: *[+MAX] unless it dominates [−MAX]

These definitions were not included in the above well-formedness conditions, however, because it seems reasonable to assume that they constitute, in a sense, the intrinsic definitions of the features in question. Note, furthermore, that the conditions (i) and (ii) serve to prevent precisely those adjunction structures from being base-generated which are generally thought to be derivable by movement, thereby minimizing redundancy (or: indeterminacy) in the system. See Van Riemsdijk (to appear) for discussion of this latter point.

b. **No Value Reversal (NVR)**:

Within a projection, the following holds:

*[−L/F]
|
[+L/F]

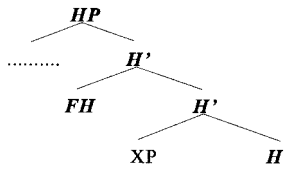
c. **Phrases Are Maximal (PAM)**:

Phrases must be dominated by a (unique) [+M] node at both d-structure and s-structure. (Cf. Van Riemsdijk (1989))

(8) **(M-)Projection**: An (M-)Projection M is the maximal (vertical) path through a tree such that that path satisfies the well-formedness conditions CIT and NVR (where M, in a sense, stands both for 'maximal' and for 'minimal'; for 'micro-' and for 'macro-').

The following example illustrates a typical simple case of a well-formed projection, where the italicized nodes, including *FH* (i.e. the functional head) are all part of the projection. All other nodes, here XP, are dependents of the projection.

(9)



There is no doubt that this system raises a number of questions, not all of which can be addressed here. Perhaps the most obvious one has to do with the concept of specifier. One common way in the standard system to structurally define the notion of specifier was to say that SPEC is the dependent that is immediately dominated by the maximal projection node HP. This would imply that there is exactly (or at most, depending on whether SPEC is taken to be obligatory) one SPEC node per projection. This may well be correct. The multiplication of functional heads has given rise to the postulation of as many specifiers, very few of which are independently motivated or even useful, despite some ingenious proposals such as those in Cinque (to appear) relating to adjectives and adverbs. On the other hand, the notion of specifier-head agreement, and its further development within the framework of checking theory (cf. Chomsky (1995)), suggests a different way of thinking about specifers. Assuming that the agreement (or: checking) relation between a specifier and some XP is always unique, we can define specifiers as those dependents of a projection that entertain an agreement relation with some (functional) head of that projection. Subjects, being standardly

analyzed as specifiers, would then be defined as precisely those XPs which entertain an agreement relation with a designated functional head in the verbal (M-)Projection, generally I° or AgrS°. Along similar lines, complements are defined as those dependents of a projection that are licensed in terms of theta-identification by the lexical head. Any dependent which is not a specifier nor a complement is an adjunct.[11] These definitions can be summarized as in (10).

(10) A DEPENDENT D of an (M-)Projection M is
  (i) a SPECIFIER if it entertains an agreement relation with a functional head of M;
  (ii) a COMPLEMENT if it is theta-identified by the lexical head of M;
  (iii) an ADJUNCT in all other cases.

In this section, I have reviewed the reasons for preferring the notion of (M-)Projection over Grimshaw's 'extended projection.' The main argument for this choice is that the concept of (M-)Projection permits a principled and non-stipulative formalization of the notion of endocentricity in its full force. There is no distinction between normal (perfect) and extended projections and categorial identity is simply the basic concept of coherence that holds within a projection. The major consequence which this conclusion forces upon us is that there can be more than one head within a single projection. And it is this conclusion which brings us to a conception of phrase structure which is close in spirit (though not in some of its details) to Emonds' work.

In the next two sections of this article, I will propose two extensions of this conception of phrase structure. The first one of these extensions is directly connected with this idea that there can be more than one head per projection. In fact, the question arises, what kinds of heads are permitted within a projection. In section 3. I will argue that in addition to the lexical head and several purely functional heads, a projection can also contain semi-lexical heads. The introduction of semi-lexical heads will thus be seen to provide strong support for the idea that projections can contain several non-lexical heads, and thereby for the notion of 'extended' endocentricity as defended here. In fact, if semi-lexical heads are part of endocentric projections, then such a conclusion holds *a fortiori* for functional heads. Equally important is the fact that the Categorial Identity Thesis, being the central notion in the definition of projection, correctly predicts that semi-lexical heads in a projection must be

[11] By this I do not want to imply that adjuncts are not licensed, all I am saying is that they are licensed in a way that is different from either agreement or theta-identification. Predication comes to mind as a plausible licensing mechanism for adjuncts.

of the same category as the lexical and the functional heads of that projection. These predictions will be seen to be empirically supported by the direct partitive construction and the qualificational construction as found in Dutch and German. In 4.1. I will address the formal consequences of the introduction of semi-lexical categories for the system presented in the present section.

The second extension will be presented in section 4.2., where I will reexamine the status of PPs and CPs. Grimshaw (1991) takes these to be extended projections of NP/DP and VP/IP respectively. I will argue instead that P and C have ambivalent status: they are sometimes semi-lexical and sometimes functional, but categorially they always preserve their own identity. They are heads in what I will call an E(xpanded) (M-)Projection (EMP) because categorial identity is not fully preserved within the EMP. Since this is a conclusion which is potentially in conflict with the necessity of preserving endocentricity in full, the Categorial Identity Thesis must be restated to permit the interspersion of P and C as neutral elements within EMPs. I conclude in section 5 with some speculations about the conceptual relationship between the CIT on the one hand and the Unlike Feature Constraint (UFC), which I proposed in Van Riemsdijk (1988), on the other hand.

3. Semi-lexical heads

In the preceding section, I have introduced an essentially Emondsian theory of phrase structure. I will now proceed to an examination of two constructions of German and Dutch which constitute evidence for the existence of a functionality level which is intermediate between lexical and functional heads. In section 3.1. I will paraphrase the main findings on the direct partitive construction (DPC) in Dutch from Vos (forthcoming). In 3.2. I will argue that the so-called restrictive appositive as found in examples like *die Stadt Berlin* ('the city Berlin') in German also involves semi-lexical heads. My argument will be largely based on a comparison of this construction with another construction which I consider to be the real instantiation of restrictive appositives. Both of these constructions are taken from the nominal domain. Looking for instances of semi-lexical categories in the verbal domain is an obvious direction in which the research should be taken next.[12]

[12] Pursuing this line of enquiry in the present article would go well beyond the possibilities. Suffice it to note that the Verb Raising (V-to-V Raising) construction found in Dutch and German constitutes a fairly good starting point for such an investigation. In most analyses (cf. Evers (1975), Model (1991), Haegeman and Van Riemsdijk (1986) and many others) both verbs are taken to be full, main, lexical verbs. However, as the following table suggests, there are good reasons to suppose that at least some of the verbs triggering V-to-V Raising belong in the semi-lexical class.

3.1. *The direct partitive construction in Dutch and German*[13]

In a direct partitive construction (DPC), two nouns that are in a partitive relation to one another are directly juxtaposed without the intervention of an intermediate preposition or genitive case marker. The latter way of expressing the partitive will be referred to as the indirect partitive (IPC). Example (11) from Dutch illustrates the difference.

(11) a.	een plak kaas	Det – N_1 – N_2	DPC
	a slice cheese		
b.	een bus met toeristen	Det – N_1 – Prep – N_2	IPC
	a bus with tourists		

VERB RAISING TRIGGERS (in German)	infin. marker	ECM	Class: open/closed	examples
Auxiliaries	Ø	NO	closed	haben (perf.), werden (pass.)
Modals	Ø	NO	closed	können (be-able-to), wollen (want), helfen (help)
Causatives	Ø	YES	closed	lassen (let, make)
Perception verbs	Ø	YES	closed	sehen (see), hören (hear)
Raising verbs	*zu*	NO	closed	scheinen (seem)
Temporal aspect	*zu*	NO	closed	beginnen (begin)
Optional raisers	*zu*	NO	semi-open	versuchen (try), behaupten (claim)

There are, however, a number of far from trivial problems which attend any straightforward analysis in terms of semi-lexical categories, the most important ones having to do with the ordering of elements within the verbal cluster and with the apparent occurrence of multiple subjects within one (M-)projection in the case of ECM constructions. Therefore, this issue must await future research.

[13] This section is based almost entirely on the forthcoming dissertation by Riet Vos. See also the illuminating discussion of nominal classifiers and partitive constructions in Japanese in Kubo (1996).

Vos (forthcoming), from which most of the material and analysis presented in this section is taken, distinguishes six subtypes of N_1 which are exemplified in (13).[14]

(12) subtypes:
- – quantifier noun QN
- – measure noun MN
- – part noun PartN
- – container noun ConN
- – collective noun ColN
- – kind noun KindN

(13) a. QN: een aantal voorbeelden
a number examples

b. MN: drie liter melk
three liter(s) milk

c. PartN: een snee brood
a slice bread

d. ConN: die krat bier
that case beer

e. ColN: een kudde olifanten
a herd elephants

f. KindN: vijf soorten zoogdieren
five types mammals

One of the most significant facts about DPCs is that they show the behavior of single projections rather than dual projections (that is, of N_1 taking a DP

[14] The importance of these subtypes is that they do not behave uniformly on all tests. The table below shows some of these differences. The criteria are: (i) whether N2 can take its own determiner, (ii) whether two N2s can be coordinated under N1, (iii) whether the N1 can also head an indirect partitive, (iv) whether N1 can be used as an answer to quantity questions, (v) whether N2 can be extracted under Topicalization, and (vi) whether N2 can be elliptic, licensed by quantitative *er* given a specific choice of N1.

	QN	MN	PartN	ConN	ColN	KindN
*N1-D/Q-N2	OK	OK	OK	OK	OK	OK
coordination of N2	OK	OK	OK	OK	OK	*
N1 can also head indirect part.	OK	OK	OK	+/-	OK	*
N1 answers quantity questions	OK	OK	OK	OK	OK	*
Split Topicalization	OK	OK	OK	*	*	*
er-licensing by N1	OK	OK	*	*	*	*

Following in essence Vos (forthcoming), to which the reader is referred for complete discussion of these details, I will assume that QNs and perhaps some MNs are truly functional nouns, while the other four and the remaining MNs are semi-lexical. None of these distinctions are of crucial importance in connection with the text argument, however.

complement). I will discuss three considerations that bear on this matter: selection, case agreement and the impossibility of intermediate determiners.

▶ selection (Dutch)

In DPCs, selection is generally between the predicate, say the verb governing the DPC, and either N_1 or N_2. In (14)a, for example, the verb 'turn over' would most naturally be interpreted as taking N_1 ('tray') as its object since with that verb the sentence means that the tray got turned over, although the interpretation on which all the pastries on the tray got turned over, the tray remaining top side up, is not excluded. On the other hand, if the verb is 'eat up' it is the pastries, of course, that are eaten up, not the tray, again on the most natural interpretation, discounting certain culinary gimmicks such as edible trays. In the corresponding IPC, (14)b, the latter verb yields a distinctly funny interpretation.

(14) a. Zij hebben een schaal gebakjes omgestoten / opgegeten
they have a tray pastries turned-over eaten-up
b. Zij hebben een schaal met ('with') gebakjes omgestoten / ??opgegeten

Similarly, in (15) the version without N_2 is ungrammatical because the verb 'disperse' obligatorily selects a plural or collective noun and hence cannot be construed with N_1.

(15) a. De politie moest een bus ? *(hooligans) verspreiden
the police had-to a bus hooligans disperse
b. ?*De politie moest een bus met hooligans verspreiden

Again, the corresponding IPC blocks the verb's access to N_2 and thereby yields an ungrammatical result.

▶ *case agreement* (German)

Since German is a language with overt case, the question immediately arises as to how N_1 and N_2 are case-marked. The answer is that N_1 always bears the case assigned by the case governor, that is by the governing verb or preposition. However, N_2 either agrees in case with N_1, or it shows up in the genitive. We can now identify the former situation with the DPC and the latter with the IPC, meaning that the genitive marker is effectively taken to be on a par with a preposition.

(16) a. nach zwei Flaschen rotem Wein DPC
after two bottles-DAT red-DAT wine-DAT

b. nach zwei Flaschen roten Weins IPC
after two bottles-DAT red-GEN wine-GEN

(17) a. Ich habe eine Kiste Kubanische Zigarren bestellt DPC
I have a-ACC case-ACC Cuban-ACC cigars-ACC ordered

b. ?Ich habe eine Kiste Kubanischer Zigarren bestellt IPC
I have a-ACC case-ACC Cuban-GEN cigars-GEN ordered

If the DPC consists of a single (M-)Projection, we expect all heads in that (M-)Projection to agree in case.[15] In the IPC, which by hypothesis consists of two projections, we expect the embedded projection to have its own case, which it does.

▶ *No D or Q between N1 and N2* (Dutch)

If N2 were the head of an independent projection, we would expect it to be accompanied by all the elements that characterize a DP. It turns out, however, that N2 cannot take any functional heads of the D/Q type.

(18) a. mijn collectie (*de) Duitse klassieken
my collection (the) German classics

b. een stapel (*alle) publicaties van Halle
a pile (all) publications by Halle

c. drie kisten (*25) sigaren
three boxes (25) cigars

Note that in this respect again, the DPCs shown in (18) differ radically from their IPC counterparts:

(19) a. mijn collectie met (with) de Duitse klassieken

b. een stapel met alle publicaties van Halle

c. drie kisten met 25 sigaren (elk (‘each’))

These considerations strongly suggest that DPCs constitute single projections. But if that is so, why don’t we simply analyze the N1 in these DPCs as functional heads? The reason for this is that N1 retains more of its independence than would be expected if it were a functional head. I will present two such properties: antecedenthood for relative clauses and adjective order.

▶ *antecedenthood for relative clauses* (Dutch)

Consider the following examples.

[15] Elena Anagnostopoulou informs me that in Modern Greek DPCs exhibit case agreement in much the same fashion as in German.

(20) a. een bus toeristen die allemaal dronken waren
a bus tourists who all drunk were
b. een bus toeristen die in de sneeuw was blijven steken
a bus tourists that in the snow had remained stuck

Clearly, the antecedent for the relative clause is N2 in (20)a and N1 in (20)b. This is clear not only from the semantics, but also from the number agreement which is plural in (20)a and singular in (20)b. And while the result is not particularly felicitous, it is indeed possible to have both relative clauses within the same DPC:

(21) een bus toeristen die allemaal dronken waren die in de sneeuw was blijven steken

▶ *adjective order* (German)

N1 and N2 each determine the order of the adjectives preceding them independently, a fact to which I was alerted by Guglielmo Cinque (p.c.). Consider (22).

(22) a. mit einer braunen Kiste grossen Zigarren
with a brown box big cigars
b. ??mit einer braunen grossen Kiste vs. mit einer grossen braunen Kiste
c. ??mit braunen grossen Zigarren vs. mit grossen braunen Zigarren

Observe furthermore that at least for some subtypes of N_1 the class of nouns that fit the description is, in principle, an open class. Take, for example, the class of container nouns. Many things can be containers. And new container nouns can be created all the time. Nevertheless, productivity of container nouns is significantly reduced. Consider the following examples.

(23) a. een bus toeristen (a bus tourists)
b. ?*een SETRA toeristen (SETRA = brand of buses)
c. een SETRA met toeristen (a SETRA with tourists)
(24) a. een pan soep (a pan soup)
b. ?*een saucière soep (a saucer soup)
c. een saucière met soep (a saucer with soup)

The b-examples are perhaps not so much ungrammatical as glaringly unattested. The situation seems to be similar to that found with certain compounds. Even though compounding is very free in languages like Dutch

and German, very often there is a sharp difference between the attested (or: listed) ones and the true neologisms. This seems to be true of container nouns in DPCs as well. One can actually identify new coinages which quickly attain a considerable popularity and tend to be overgeneralized. A recent (Dutch) example is *blik* ('can') as in (25).

(25) Jan heeft weer eens een nieuw blik vriendinnen opengetrokken
Jan has again once a new can girl-friends opened

I take these to be indications that container nouns (as well as partitive nouns, collective nouns and kind nouns)in DPCs, constitute a semi-open class in much the same way in which the class of prepositions might be said to be semi-open. It is not, after all, impossible to create new prepositions, witness more or less recent formations like *pending the investigation*, or, to coin a potentially new one, *upcreek from here*.

In view of this, I propose to analyze quantifier nouns, which are truly closed class items, as functional heads, but the other types of N_1s ((most) measure nouns, partitive nouns, container nouns, collective nouns and kind nouns) as semi-lexical heads. This difference is further reflected in the role that these nouns play under subject verb agreement and under gender agreement with the determiner.

As far as number agreement is concerned, consider first the ambiguity found with nouns like *paar* ('pair, couple'). On the purely quantificational reading, *paar* means 'several,' while on the collective reading it means *pair.* In the former case, agreement is with N_2, in the latter case with N_1, as shown in (26).[16]

(26) a. Er staan een paar schoenen op de tafel QN
there stand a pair shoes on the table (several)
b. Er staat een paar schoenen op de tafel PartN
there stands a pair shoes on the table (a pair)

Similarly, some measure nouns seem to waver between functional and semi-lexical status:

[16] This is a seemingly innocuous statement, but in fact it relates to a host of problems which we have not addressed systematically here. What is needed in fact is a theory of percolation. Deciding whether a certain functionality feature (or its value) is dominant or recessive, i.e. whether it does or does not percolate, is not a trivial matter, cf. also fn. 38. Similarly, many questions arise with respect to the percolation behavior of morpho-syntactic features. There are reasons to believe, for example, that in DPCs the lower part of the projection is indefinite while the upper part can be definite or indefinite, depending on the choice of functional heads. The elaboration of a full-fledged theory of percolation in M- and E-projections must await future research, however, cf. Vos (forthcoming).

(27) a. Er zit drie kilo heroine in die zak MN (functional)
there sits three kilo heroin in that bag
b. ?Er zitten meerdere kilo's heroine in die zak MN (semi-lexical)
there sit several kilos heroin in that bag

Here are some examples of number agreement with the other semi-lexical types of N_1.

(28) a. Er staat/*staan een bus toeristen voor de deur ContN
there stands/stand a bus tourists in-front-of the door
b. Er loopt/*lopen een kudde olifanten in de tuin ColN
there walks/walk a herd elephants in the garden
c. Er *wordt/worden hier twintig soorten bier geserveerd KindN
there is/are here twenty kinds beer served

Consider now the issue of gender agreement. The nouns which can act as N_1 in DPCs are lexically specified for gender. In Dutch that means that they are either neuter, with the definite determiner *het*, or non-neuter, with the definite determiner *de*. Take a case like (29).

(29) a. het vijfde glas wijn b. *de vijfde glas wijn
the fifth glass wine the fifth glass wine

The noun *glas* is neuter (*het/*de glas*) while the noun *wijn* is non-neuter (*de/*het wijn*). And, as (29)b shows, gender agreement of the determiner of the DPC is with N_1 rather than with N_2.

In conclusion, there appear to be good reasons to believe that DPCs involve a single projection in which N_1 is (almost always) a semi-lexical noun.

Before turning to a second construction exemplifying semi-lexical nouns, consider partitives in English and some of the Romance languages. In these languages N_1 and N_2 are never directly adjacent to one another:

(30) a. a pile *(of) cookies b. une tapée *(d′) enfants
a large-number of children

In view of the fact that the element intervening between N_1 and N_2 is a preposition, albeit a rather empty one, we might suspect that these are IPCs. However, they behave like DPCs with respect to selection, as shown in (31), and for this reason I will refer to them as Pseudo-DPCs.

(31) a. Mary ate a whole tray of/*with pastries
b. Jean a dilué plusieurs bouteilles de vin/*avec du vin
Jean has diluted several bottles of wine/with wine

The existence of Pseudo-DPCs constitutes an apparent problem for the analysis presented here. The problem of 'dummy' prepositional elements which are found within what one might otherwise call single projections is a much more general one, however, and this will be the topic of section 4. Within the revision of the formalism characterizing the notion 'projection' which is proposed there, Pseudo-DPCs are straightforwardly analyzable as single projection constructions.

3.2. *The so-called restrictive appositive in German: Qualificational nouns*

Let us now address a second construction which also involves semi-lexical heads in the nominal domain. I will argue that the construction often described as the Restrictive Appositive[17] is really also an instance of a nominal projection with a semi-lexical head. I will use the term 'qualificational construction' (QC) and 'qualifier' to refer to this construction and its semi-lexical head respectively. Unfortunately, most of the tests which I used in the previous discussion of DPCs are not applicable here. My argument will therefore be largely based on a comparison with the DPC on the one hand and with a number of other constructions, including one which has so far mostly escaped notice, a construction with postnominal inflected adjectives which I hope to show is the 'real' instantiation of a restrictive appositive. The material presented, unless otherwise noted, is from German.

Let me first give some examples of the constructions in question. For completeness' sake, I also give an example of a non-restrictive appositive, though the latter construction will only play a marginal role in the discussion.

A. The non-restrictive appositive (NRA)

(32) a. Herr Müller, der Bürgermeister der Stadt
mister M., the mayor of-the city
b. auf dem Matterhorn, einem der höchsten Berge Europas
on the M. one of-the highest mountains of-Europe

B. Postnominal inflected adjectives that are, in reality, restrictive elliptic appositives (REA)

(33) a. Unterhosen dreckige solltest du waschen
underpants dirty should you wash
b. alte Autos Amerikanische müssten umwelthalber verboten werden
old cars American ought-to ecologywise forbidden be

[17] See for example Heidolph et al. (1981). Similarly, Paardekooper (1977: 3.5.16), an excellent and rich discussion of this construction, lists it as a type of appositive. On the other hand, Geerts et al. (1984) associate this construction with DPCs, correctly in my view.

C. Qualificational noun phrases (QC)

(34) a. der Planet Venus
the planet Venus

b. die Stadt Wien
the city Vienna

c. der Paragraph 218
the paragraph 218

d. der Abstand Atlanta-Savannah
the distance Atlanta-Savannah

e. der Monat März
the month March

f. meine Tante Metty
my aunt Metty

g. Willem II (Willem twee) (Dutch)
William II (William the second)

To start with, notice that examples like those in (33) are somewhat misleading. On the surface, it seems as if they involve a noun phrase with a postnominal inflected adjective. This comes as quite a surprise since adjectives are generally prenominal, and while postnominal adjectives do exist, especially with heavy APs, they are always uninflected, as shown in (35).

(35) a. Ein Buch so teuer/*teures wie dieses hier
a book as expensive as this-one here
sollte man höher versichern
should one higher insure

b. Der Trainer, besoffen/*besoffene wie immer,
the coach drunk as always
fummelte an ihrem Busen
groped at her bosom

This construction, which we may call the Heavy AP Shift (HAPS) construction, is indeed quite different. There is little doubt, in fact, that examples like those in (33) consist of a noun followed by a noun phrase. These examples are actually misleading in yet another respect. As shown in more detail below, the adjective is usually preceded by an overt article. In (33) this article was zero because the noun phrases in question were indefinite plurals, which never have an overt article. Examples with overt articles are given in (38) and (39) below. If the adjective in these examples is indeed part of a noun phrase, then that noun phrase is apparently elliptic, since the adjective does not have a noun of its own. In fact it cannot have a noun of its own:

(36) Für einen alten Wagen einen Amerikanischen (*Schlitten)
for an old car an American gas-guzzler
würde ich keinen Dollar zahlen
would I no dollar pay

But if this is correct, then the adjective is actually prenominal in the sense that it precedes the missing N or N′ in the elliptic noun phrase. And so we

expect the adjective to be inflected as in fact it always must be in elliptic noun phrases.

(37) – Hat er sich ein Auto gekauft?
has he (refl.) a car bought?
– Ja, und zwar ein sehr schnell-*(es).
Yes, and in-fact a very fast

Let us now turn to some properties that will help us to establish a clustering of the various constructions in question. I will address the following three properties that have a bearing on the matter.

- the article is/is not repeated in the postnominal part
- the second part can/cannot extrapose
- main stress falls on the first nominal part (N_1)/on the second nominal part (N_2)

▶ *repetition of the article (and other modifiers), and even of prepositions*

If, unlike the examples in (33), which are indefinite plurals and hence do not require an overt determiner, we look at singulars, we see that the appropriate article must accompany the postnominal adjective.

(38) Eine Unterhose *(eine) dreckige solltest
a underpant a diry should
du nicht wieder anziehen
you not again put-on

(39) Für ein altes Auto *(ein) Amerikanisches
for an old car an American
würde ich keinen Dollar zahlen
would I no dollar pay

Sometimes, even a preposition is repeated postnominally.

(40) Auf einen Drink auf einen kurz-*(en)
for a drink for a quick
komme ich gern schnell hinüber
come I gladly quickly over

In this respect, Restrictive Elliptic Appositives (REAs) differ from Direct Partitive Constructions (DPCs) and from most Qualificational Constructions (QCs). Consider first DPCs. As observed in 3.1., these can never have an article between N_1 and N_2, even though adjectives are permitted to intervene.

(41) a. ein Glas (*ein) guter Wein (cf. (ein) guter Wein)
a glass a good wine a good wine
b. *eine Kiste die besten Weine Frankreichs
a case the best wines of-France

With QCs, we find a more erratic pattern, both language internally and cross-linguistically.

(42) a. Dutch: Willem II (Willem twee) Willem de tweede
William two William the second

(43) German:
a. der Monat Mai – *der Monat der Mai
the month may the month the may
(cf. *(der) Mai))
the may
b. meine Tante Anna – *meine Tante die Anna[18]
my aunt Anna my aunt the Anna
(cf. (die) Anna)
the Anna

(44) Dutch:
a. *de rivier Rijn – de rivier de Rijn (cf. *(de) Rijn)
the river Rhine the river the Rhine the Rhine
German:
b. ?*der Fluss Rhein – *der Fluss der Rhein – der Rhein
the river Rhine the river the Rhine the Rhine

We see that the appearance of the article in QCs is generally excluded, exceptions being subject to some rather specific and, presumably at least in part idiosyncratic, restrictions that are related to whether standalone names can or cannot be preceded by an article.

Observe now that the Categorial Identity Thesis (CIT), which we are currently expanding to encompass semi-lexical heads, does not in itself preclude determiners from popping up at various points in a nominal projection. This seems reasonable to the extent that there is good reason to assume that the absence of the article in DPCs is at least in part due to their semantics. If the semi-lexical noun in DPCs has a certain quantificational force, as it does, then we would not expect other quantificational elements including articles to show up since they would cause double quantification. This line of reasoning is confirmed by the fact that quantificational adjectives are excluded in DPCs while non-quantificational ones are permitted.

[18] Examples like these are grammatical, as expected, on the NRA reading, but then they require an intonation break between the first noun and the article of the second.

(45) a. een kist *de/*twintig/*talrijke/Cubaanse sigaren
a box the/twenty/numerous/Cuban cigars

Despite this complication, we may conclude that the appearance of the article is severely restricted in both DPCs and QCs.[19]

▶ *extraposition*

The Restrictive Elliptic Appositive (REA) can extrapose. In this respect it resembles the Non-Restrictive Appositive (NRA) and (irrelevantly) Heavy AP Shift (HAPS). But, crucially, it differs from the qualificational construction (QC). This is illustrated in the following examples.

(46) Ich habe glücklicherweise doch noch eine
I have fortunately after all an
Unterhose gefunden eine saubere REA
underpant found a clean

(47) Ich habe Herrn Müller getroffen, den
I have mister M. met the
Bürgermeister der Stadt NRA
mayor of-the city

(48) *Wir have den Planeten gesehen, Venus QC
we have the planet seen Venus

(49) Ich habe keine Unterhose gefunden sauber
I have no underpant found clean
genug, um sie anziehen zu können HAPS
enough for it put-on to be-able-to

The impossibility of extraposition with QCs can again be assimilated to the fact that the second nominal part of DPCs cannot be extraposed either, as shown in (50)

(50) a. *Ik heb [drie glazen [e]$_i$] gedronken [Franse wijn]$_i$ DPC
I have three glasses drunk French wine

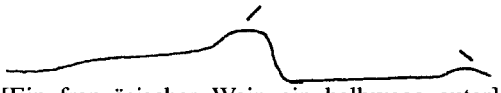
If DPCs and QCs are assigned the same type of structure with N1 being a semi-lexical head and the whole construction consisting of a single (M-)Projection, then the impossibility of extraposition can simply be

[19] For more extensive discussion of the interaction of determiners with proper names as well as some proposals to treat these in terms of N-to-D Raising, see Longobardi (1994). As far as I can tell, his theory is not incompatible with the proposals made here, which is why I will not pursue this matter any further here.

attributed to the general observation that extraposition can only apply to (maximal) phrases.

▶ *stress and intonation*

The Restrictive Elliptic Appositive (REA) requires a very specific intonation contour, otherwise it will immediately be felt to be ungrammatical. Unlike the non-restrictive constructions, in which the appositive noun phrase (or adjective phrase) constitutes an independent phrasal stress domain, the REA must be part of the stress domain that contains the head. Furthermore, it is the head noun that receives the main stress, after which there is a sharp fall in pitch followed by a rather low, flat, sometimes slightly rising intonation contour on the REA itself. This is exemplified in the following example.[20]



(51) [Ein französischer Wein ein halbwegs guter] ist nicht ganz billig
a French wine a halfway good is not entirely cheap
A more or less decent French wine doesn't come exactly cheap

In this respect, the REA is radically different from the QC and the DPC. In the latter constructions, the main stress falls on the second noun, which we may therefore take to be the (lexical) head.

The results obtained by this comparison of the constructions under consideration can be summarized in the following table.

(52)

	HAPS Heavy AP Shift	NRA Non-Restrict. Appositive	REA Restr.Elliptic Appositive	QC Qualificational Construction	DPC Direct Partitive
$\surd N_1$ Det N_2	(d.n.a.)	YES	YES	very limited	NO
N_2 extraposition	YES	YES	YES	NO	NO
main stress on	N_1	N_1	N_1	N_2	N_2

[20] Interestingly, this property even holds in the case of extraposed REAs. For example, in (46) the main stress and intonation peak is on the head noun *Unterhose*, as expected. The low flat continuation shown in (51) starts immediately after that noun, i.e. on the verb and extends to the end of the extraposed REA.

We may conclude that there are good grounds to believe that QCs pattern with DPCs and hence constitute a second instantiation of nominal projections consisting of a semi-lexical noun followed by a lexical noun.

4. A revision of the Van Riemsdijk (1990) System

4.1. *Accommodating semi-lexical categories*

A first task now is to modify the system of (M-)Projections as outlined in section 2 so as to accommodate semi-lexical heads. The categorial features remain the same, as do the *L*-features repeated here for convenience. But a modification in the *F*-features is necessary, because we now require a three-way distinction. I am proposing here, very tentatively, that there are two *F*-features as shown below.

(53)	*L*-features:	[−PROJ, −MAX]	= head (H°)
		[−PROJ, +MAX]	= intermediate node (H′)
		[+PROJ, +MAX]	= max. proj. node (HP or H^{max})
		([−PROJ, +MAX]	= unprojected particles)
(54)	*F*-features:	[±F(unctional)]	
		[± G(rammatical)]	

'Functional heads/projections' in the original sense are [+F, +G]; lexical heads are [−F, −G]. This leaves two possible intermediate categories: [+F, −G] and [−F, +G], and hence we have a four-way rather than a three-way distinction. Conceivably, this might be used to distinguish the two main types of semi-lexical nouns illustrated above: partitive nouns and qualificational nouns. One of the immediate advantages of this choice is that the No Value Reversal Condition can be maintained in its current formulation, which says that within a projection line, a node which is negatively specified for some level feature or functionality feature may not be dominated by a node which is positively specified for that same feature.

(55) **No Value Reversal (NVR) revised:**

With in a projection, the following holds: $*[-f_i]$
where $f_i \in \{L\}$ or $f_i \in \{F\}$ |
$[+f_i]$

Note that this formulation predicts that the two subclasses of semi-lexical projections tentatively defined above ([+F, −G] and [−F, +G]) can not be combined within one and the same projection. If indeed DPCs and QCs are

distinguished along these lines, the prediction will be that these two constructions cannot be combined within a single projection. This prediction appears to be correct, but I will not pursue the matter at this point.[21]

4.2. *The status of P*

4.2.1. *P = N or P ≠ N?*

Among many other ramifications concerning the notion of 'extended projection', many of which I will not be able to address, Grimshaw (1991) also discusses the status of PP and CP. In her analysis, PP is the highest extended projection of NP/DP, while CP is the highest extended projection of VP/IP. She notes that this makes her approach similar to Emonds' (1985) proposal to identify C with P. It is not clear, however, what exactly is meant to constitute the similarity of the two analyses.After all, as Grimshaw notes, PPs, on her analysis are [+N, −V] while CPs are [−N, +V]. In Emonds' theory, on the other hand, PPs and CPs are both [−N, −V], a conclusion supported by various distributional similarities between the two categories.

Let us first look at the case of PP in somewhat greater detail. There are undoubtedly cases in which it is attractive to consider PP a functional extension of NP/DP. Take for example the case of prepositional objects as found in sentences like (56).

(56) John hates to *part with* old friends
I never *thought of* that possibility
He'll *get at* you sooner or later

Surely we want to be able to express somehow that *part (with)* etc. is a two place predicate and that the DP (*old friends* etc.) is the second argument of this (complex) predicate. In fact, we want to be able to express the fact that there is a direct selectional dependency between the verb and the noun in which the preposition plays little or no role. But if the PP is a syntactic consituent, and if P is an independent lexical head, standard locality restrictions will force us to say that the verb selects the PP and that within that PP the P selects the DP. On a proposal like Grimshaw's this problem is solved. Equally clearly, the same argument does not apply in the case of prepositional

[21] There are some potential counterexamples, as shown in (i)

(i) a. zwei Gläser Château Lafite ('two glasses (of) C.L.')
b. ??eine Art Kaiser Hirohito ('a type of Emperor H.')

To the extent that these are possible at all, I feel that the QC embedded under the container or kind noun is more like a compound name than a regular QC in which N1 retains a share of its original semantics.

adjuncts. In a sentence like (57), the DP does not appear to be an argument of anything except, perhaps, of the preposition itself.

(57) Before the war, life was much better

This conclusion is particularly clear in constructions in which there is no other predicate but the (directional) preposition, as illustrated, for example, in (58).

(58) Into the garage with that junk!

Another consideration supporting the view that prepositions can be fully independent heads of their own is the fact that they can be intransitive as in examples like the following.

(59) a. What happended half an hour before?
b. He stayed inside for three years

In view of this dual role played by prepositions, it would be rather natural to come to the conclusion that prepositions are sometimes functional and sometimes lexical. A similar conclusion might also be reached for the status of C and CP. Some complementizers like *that*, (interrogative) *if, for,* etc. could be considered to be purely functional from this perspective, while the complementizers introducing adjunct clauses such as *before, while,* (conditional) *if, when,* etc. would be more or less lexical. In Grimshaw's system, this would mean that prepositions are sometimes functional, in which case they are [+N, −V] and sometimes lexical, in which case they would presumably be [−N, −V]. Similarly, C would sometimes be functional and hence have the category status [−N, +V] and sometimes constitute a category of its own, perhaps also [−N, −V].

There are reasons to be sceptical about such a categorial dichotomy, however. There are, in fact, a number of considerations which suggest that PPs constitute a category *sui generis* and the relevant phenomena hold of 'functional PPs' and 'lexical PPs' alike. I will briefly review three properties showing this: external distribution, internal syntax, and N-P dependencies.

▶ *External distribution*

There are contexts where PPs can appear while DPs are excluded. An approach like Grimshaw's, in which PPs carry the same categorial features as DP, appears to be ill-equipped to deal with this type of fact. Consider first the fact that PPs can be extraposed to a post-verbal position in Dutch, while this possibility is basically excluded for DPs.[22]

[22] There are some specific situations in which DPs can occur postverbally, including enumerations, legalese and obituaries, but these are well-delimited and do not affect the argument.

(60) a. Ik had niet *op zoveel mensen* gerekend
I had not on so-many people counted
b. Ik had niet gerekend *op zoveel mensen*
(61) a. Hij gaat *op zondagochtend* altijd golfen
he goes on Sunday-morning always play-golf
b. Hij gaat altijd golfen *op zondagochtend*
(62) a. Ik had niet *zoveel mensen* verwacht
I had not so-many people expected
b. *Ik had niet verwacht *zoveel mensen*
(63) a. Hij gaat *de hele dag* golfen
he goes the whole day play-golf
b. *Hij gaat golfen *de hele dag*

The contrast between the PP cases in (60)/(61) and the DP cases in (62)/(63) is sharp and clear. Significantly, the contrast holds with equal force for those cases in which PP and DP are arguments, i.e. (60) and (62), and for those cases in which they are adjuncts, i.e. (61) and (63).[23] In view of considerations such as these, I believe it is preferable to consider PPs to have the (external) status of [−N, −V], regardless of whether they function as arguments or as adjuncts.

The same considerations carry over to CPs. CPs are awkward or even downright ungrammatical in the preverbal position,[24] but they extrapose freely, again regardless of whether they function as arguments or as adjuncts.

(64) a. *Ik had niet [dat er zoveel mensen zouden komen] verwacht
I had not that there so-many people would come expected
b. Ik had niet verwacht [dat er zoveel mensen zouden komen]
(65) a. ?Hij gaat [terwijl iedereen naar de kerk gaat] golfen
he goes while everybody to the church goes play-golf
b. Hij gaat golfen [terwijl iedereen naar de kerk gaat]

Emonds (1985) concludes from such facts, correctly in my opinion, that PP and CP have the same categorial status, i.e. [−N, −V].

[23] Note incidentally that this consideration also argues against an approach to DP-adverbs such as duratives and measure phrases in terms of empty prepositions, such as the one given in Larson (1985).

[24] The contrast between (64)a and (65)a raises questions, of course, but these do not affect the fact that extraposition is possible for PP/CP while being excluded for DP and AP.

▶ *Internal syntax*

In many languages, the internal syntax of PPs exhibits certain peculiarities. The appearance of so-called *r*-pronouns in Dutch PPs is a typical example.[25] In brief, non-human pronouns are replaced, sometimes optionally and sometimes obligatorily, by the corresponding pronouns from the set of locative pronouns. These are the ones referred to as *r*-pronouns because all of them happen to have the phoneme /r/ in them. Thus *het* ('it') is replaced by *er* (unstressed 'there'), *wat* ('what') by *waar* ('where'), *niets* ('nothing') by *nergens* ('nowhere'), etc. Furthermore, these *r*-pronouns occur to the left rather than to the right of the preposition. Note that this is true also of 'true' prepositions, that is not only those directional ones (cf. (3) and (4)) that occur in the phrase-final functional slot.

Pursuing the strategy of systematically comparing argument PPs and adjunct PPs, it is of interest to observe that the suppletion of regular pronouns by *r*-pronouns with their peculiar syntax, applies in argument PPs and adjunct PPs alike.[26]

(66) a. ??Ik had op niets gerekend
I had on nothing counted
b. Ik had nergens op gerekend
I had nowhere on counted

(67) a. *Hij gaat voor het altijd golfen
he goes before it always play-golf
b. Hij gaat er voor altijd golfen
he goes there-before always play-golf

Again, such considerations provide grounds for categorially identifying argument and adjunct PPs.

▶ *P-N dependencies*

A final set of facts to be examined here comes from the rather peculiar dependencies that exist between prepositions and other heads. The case that comes most easily to mind is that of verbs selecting specific prepositions. *Rely*

[25] See Van Riemsdijk (1978) for extensive discussion. The notion of 'location' is somehow linked with the (semi-)lexical P-slot, while the other locational functions such as direction and orientation are linked with the functional P-slot. In Dutch both of these can license an r-pronoun under specifier-head agreement, Cf. also Koopman (1993) and Zwarts (1995a).

[26] It should be noted that the categorial status of P/PP is a necessary but not a sufficient condition for the exhibition of r-syntax, cf. Zwarts (1995b). More generally, I am not, of course, arguing that the syntax of argument PPs and adjunct PPs is identical in all respects.

goes with *on*, *look* goes with *after*, *suffer* goes with *from*, and so on and so forth. These are dependencies that we expect to find between a selecting head and the head of its complement. But there are also dependencies between P and N. For example, any speaker of a foreign language has to learn the fact that in English, a picture is *on* the wall, not *at* the wall. Similarly, it is part of the knowledge of Dutch that you drive over the Veluwe (*over de Veluwe*) and through the Betuwe (*door de Betuwe*), the Veluwe being a dune-like landscape North-West of Arnhem with elevations of several meters that can be considered significant for Holland, while the Betuwe is an area to the South-West of Arnhem, enclosed between two rivers and, more significantly, between the dykes that protect it from flooding by those rivers.

Note first that here again, these P-N dependencies hold regardless of whether the PP is an argument or an adjunct, as illustrated in the following examples.

(68) a. Could you put those pictures on/*at the wall?
b. On/*at the wall, we discovered some peculiar pictures

A second important fact to be noted here is that these P-N dependencies are, in a sense, bottom up rather than top down. By this I mean that it is (our lexical knowledge of) the noun that determines the choice of the preposition, not the other way around. It is my lexical knowledge of the geographical term Betuwe, only accidentally connected with some idea of its actual topographical peculiarities, which tells me that it is an area with an interior and that therefore reference to locations should make use of internal prepositions such as *in*, *through*, *out of*, etc. In this respect, P-N dependencies are quite different from V-P dependencies which are typically top down. That is, in an example like 'he relies on his intelligence' it is *rely* that determines the choice of *on* rather than the other way around. The significance of this fact is that P-N dependencies cannot plausibly be used to identify the preposition as a lexical head. Instead, the situation is most reminiscent of gender selection in the noun phrase. There, too, it is the lexical head noun that determines the choice of the article rather than the other way around.[27] More dramatically, this is what we find in nominal classifier systems, where it is also the lexical properties of the head noun that determine the choice of the classifier. And classifiers

[27] It should be noted here that this observation does not commit us to the introduction of a new theoretical notion such as 'inverse government' or any new technical devices. If one adopts, for example, a checking approach to selectional dependencies, then the (relevant features of the) lower head are raised to the higher head, thereby creating the checking configuration. But what I am saying here is that there is one type of selectional dependency in which it is the intrinsic features of the lower head that determine the choice of the higher head, and that it is this case which is characteristic of dependencies within a single (M-)Projection.

are similar to prepositions in that they constitute, in a sense, a semi-open class of elements, at least in some languages.[28] Hence, P-N dependencies are perfectly consistent with prepositions being functional or, as we will suggest below, semi-lexical heads.

What conclusions do we draw from these considerations? I propose to adopt the following assumptions.

- Prepositions and their projections are categorially distinct from NP/DP. They are characterized as [−N, −V].
- Therefore, by the CIT, they cannot be part of the (M-)Projection of nouns.
- Nevertheless, they should, in a sense yet to be made precise, be considered (extended) projections of nouns, at least when they are transitive.
- One aspect of this decision is that a nominal projection embedded in a preposional shell does not constitute a maximal projection DP; instead there is a transition from D′ to P′, induced by the prepositional head. In other words, I am proposing that (M-)Projections can have a [−N, −V] shell, and I will for the sake of expliciteness refer to such expanded (as opposed to extended) projections as E-Projections.
- The arguments referred to earlier to the effect that in addition to prepositions there are also functional prepositions remain fully valid.
- This fact, together with the fact that the class of prepositions is not a fully open lexical class leads to the assumption that in many cases prepositions are semi-lexical heads.
- In the case of intransitive prepositional phrases, I take this to mean that a projection can be headed by a semi-lexical head which can then occupy the position of the lexical head.

4.2.2. *DPs with semantic case*[29]

Let us now summarize what we have so far. Nouns, in addition to their 'normal' functional shell, can have a prepositional functional shell which consists of a semi-lexical prepositional head and (sometimes) a functional prepositional head. Let us now turn to a closely related problem, which will

[28] See Kubo's (1996) analysis of classifiers in Japanese. Kubo adopts Emonds' three way distinction between purely syntactic, purely semantic and cognitive elements in grammar, which is, the one I adopt in the proposal outlined here, albeit with a different terminology.

[29] I would like to thank the members of the KAAS-group at Tilburg University, the coauthors of Huijbregts et al. (forthcoming), for the stimulating discussions we have had on the subject of spatial case systems. Thanks also to the members of the Cognitive Anthropology Group at the Max-Planck-Institut in Nijmegen, who were kind enough to listen to my opinions and questions. Thanks finally to the audiences at the University of Trondheim, Keio University in Tokyo, the University of Tsukuba, and at Hokkaido University in Sapporo for their reactions to my talks about spatial prepositions.

be seen to shed more light on the issue, viz. the problem of deciding whether DPs with semantic or notional case are really DPs or PPs.

Consider Finnish. In Finnish we find a relatively rich case system with several locative/directional cases alongside various pre- and postpositions. A typical example is the following from Nikanne (1993).

(69)	Nuoripari	suuteli	**liki**	Toukola-n	kylä-ä
	young-couple	kissed	near	Toukola-GEN	village-PAR
(70)	Nuoripari	suuteli	Toukola-n	kylä-**ssä**	
	young-couple	kissed	Toukola-GEN	village-INE	

Nikanne (1993) argues on the basis of distributional evidence that a DP with semantic case is a PP with an empty preposition that assigns that case. He notes, on the basis of examples like the above that true PPs with a real preposition and DPs with a semantic case have the same distribution. However, as we saw above in the section called 'external distribution' of subsection 4.2.1., such arguments are problematic. The domain of the verb typically admits both true PPs and true DPs. In truly diagnostic contexts such as extraposition in Dutch and German, we see that DPs have a different distribution from PPs. This was illustrated in the examples (60) through (63). Another diagnostic context in Dutch, and presumably in many other languages, is the domain of the noun, where DPs are excluded but PPs are permitted, as shown in (71)b.[30]

(71) a.	Ik	ben	vier	dagen	onder	weg	geweest	
	I	have	four	days	under	way	been	
b.	Een	reis	*(van)	vier	dagen	is	mij	te vermoeiend
	a	trip	of	four	days	is	for-me	too tiring

We conclude from such facts that even without any overt case a noun phrase can have adverbial status. Positing empty prepositions just confuses the matter and makes wrong predictions with respect to the distribution of these phrases.

[30] It might be objected that genitive DPs can occur in the domain of N quite freely in many languages. Recall, however, that I argued that the Genitive that shows up in German partitives is really like a PP, and that these constructions should be considered to be equivalent with Indirect Partitive Constructions. This means that genitive marking is on a par with 'full' prepositions like *with*. I assume, therefore, that genitives are DPs with a [−N, −V] shell, very much like the locative cases discussed in the present section.

Observe now that DPs with overt semantic case, as far as can be determined, pattern like PPs. Here is an example showing that a DP with semantic case can occur in the domain of a noun.[31]

(72)	Tie	Helsinki-in	on	huono	
	way	H-ILL	is	bad	(lit. The way into H. is bad)
(73)	Tie	Turu-lle	on	huonompi	
	way	Turku-ALL	is	worse	(lit. The way to T. is worse)

We may assume, therefore, that such phrases should be analyzed as E-projections in the manner outlined in section 4.2.1.

Recall now that we have assumed that the PP shell consists of a semi-lexical head and a functional head, where the semi-lexical head typically expresses a location whereas the functional head serves to express direction and/or orientation and is furthermore the place where deictic particles are attached. This is in essence the structure of circumpositional PPs in German referred to in section 1., with LOC and DIR/OR being the main semantic features associated with the semi-lexical and the functional P respectively, as argued in more detail in Van Riemsdijk (1990). This structure is made explicit in (79) below.

Interestingly, there is direct evidence for this association of spatial features with the elements in the prepositional functional shell of DPs from languages with locative case systems that are even richer than the Finnish one. Such languages are found in the Caucasus, more particularly among the Daghestanian languages, and one of them which is particularly well described is Lezgian.[32] Lezgian has a set of 15 locational cases which are expressed by suffixes on the noun.[33] Interestingly, there are two transparently identifiable suffixes for each case, one to indicate a specific location and one to express the presence or absence of motion and, in the latter case, whether the direction is TO or FROM. We may now assume that these suffixes are the bound morpheme expressions of the pre- and postpositional elements we earlier identified in German. Not surprisingly, therefore, we find that the

[31] Observe that Helsinki is lexically specified to be construed with internal cases while *Turku* is construed with the external cases; this is parallel to the P-N dependencies discussed in subsection 4.2.1.

[32] The data presented here are from Haspelmath's excellent grammar of Lezgian: Haspelmath (1993). As it happens, the Lezgian semantic case system is by no means the richest one found in the area. Other notoriously complex ones are found in Lak (K. Kazenin, p.c.), Tabasaran (cf. Hjelmslev (1935/37), and Archi (cf. Kibrik (1996)). The Lak system, for example, has 35 locational cases where Lezgian 'only' has 15. See also Huijbregts et al. (in preparation) for further discussion.

[33] Reportedly, one of the 15 cases, the indirective, is not attested. I will assume that this is an 'accidental gap' in the system.

locational suffix is internal, i.e. closer to the stem, than the directional suffix. An example of a full paradigm including the grammatical cases, taken from Haspelmath 1992), is given in (74).[34]

(74)

Absolutive:	*sew*	the bear
Ergative:	*sew-re*	the bear
Genitive:	*sew-re-n*	of the bear
Dative:	*sew-re-z*	to the bear
Adessive:	*sew-re-w*	at the bear
Adelative:	*sew-re-w-aj*	from the bear
Addirective:	*sew-re-w-di*	toward the bear
Postessive:	*sew-re-q^h*	behind the bear
Postelative:	*sew-re-q^h-aj*	from behind the bear
Postdirective:	*sew-re-q^h-di*	to behind the bear
Subessive:	*sew-re-k*	under the bear
Subelative:	*sew-re-k-aj*	from under the bear
Subdirective:	*sew-re-k-di*	to under the bear
Superessive:	*sew-re-l*	on the bear
Superelative:	*sew-re-l-aj*	off the bear
Superdirective:	*sew-re-l-di*	onto the bear
Inessive:	*sew-re*	in the bear
Inelative:	*sew-re-aj (→sewräj)*	out of the bear
Indirective:	(does not exist)	into the bear

[34] It should be noted that the suffix *-re* is a semantically neutral augmentative suffix referred to as 'oblique stem marker.' This type of element can, I believe, be interpreted as the bound analogue of truly dummy prepositions found in many contexts including (i) complex prepositions such as Italian *sopra di me* ('above (of) me'), (ii) French compound-like structures such as *marchand de vin* ('wine merchant'), (iii) Pseudo-DPCs such as *glass of wine*, (iv) prepositional infinitive markers, etc. Along similar lines, the partitive case found in languages such as Finnish can be considered the bound analogue of the preposition found in Pseudo-DPCs. Extending this idea yet one step further, such transitional dummy prepositions can now be considered as a bridge between nominal and verbal projections, making it possible to account for transcategorial constructions such as gerunds in English. The prediction inherent in the latter idea is that transcategorial constructions are *only* possible if there is a prepositional bridge element.

The locational case system of Lezgian can be described as follows.

(75)

Lezgian case	2nd morpheme	-Ø	-aj	-di
1st morpheme	meaning	NO MOTION	FROM	TO
-w	AD	adessive	adelative	addirective
-q^h	POST	postessive	postelative	postdirective
-k	SUB	subessive	subelative	subdirective
-l	SUPER	superessive	superelative	superdirective
-Ø	IN	inessive	inelative	(indirective)

These case forms serve to express both lexically selected phrases and adjuncts, as shown in the following examples (from Haspelmath (1993)) involving the adelative case.[35]

(76) a. Jarği Ali.di ada-w-aj pul qaču-na
tall Ali(ERG) he-ADEL money take-AOR
'The tall Ali took the money from him'

b. Ana, k'wal.i-waj jarğaz, zi ümür hik' že-da?
there, house-ADEL far, I:GEN life how be-FUT?
'There, far from home, how will my life be?'

The most obvious way, then, to analyze Lezgian semantic case is to assume that nouns fully project to a prepositional E-projection with both a semi-lexical LOC head and a functional DIR/OR head, and that when those heads are occupied by bound morphemes, the lexical nominal head is raised first to the semi-lexical P (LOC) and then to the functional P (DIR/OR).

Case systems such as these corroborate, I feel, the conception of prepositions as elements which are sometimes semi-lexical and sometimes functional. The question remains as to whether fully lexical prepositions exist at all. Conceivably, intransitive prepositions could be considered to be lexical, though their more or less closed-class status could also be taken to imply that these as well are semi-lexical. This means that we could either assume that a [−N, −V] projection which is not rooted in a nominal head could start with

[35] As pointed out by K. Kazenin (p.c.), there are many more or less idiosyncratic dependencies that hold between specific nouns and the choice of case. These dependencies are always between the noun and the choice of the first morpheme, i.e. between the noun and the rows, referred to as 'series' among caucasiologists, in the table. Once that dependency has been established, however, the choice of the column (the second morpheme) is free and regular.

a semi-lexical head at the bottom, or with a true lexical head position into which a semi-lexical preposition is lexically inserted. I see no considerations that decide the matter at this point.

4.3. *Revising the CIT: Expanded (M-)Projections*

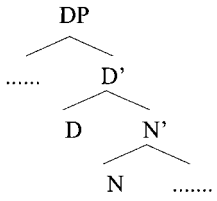
In order to make things more precise now, let us adopt the following definitions. First, we will distinguish three types of heads as follows.[36]

(77)

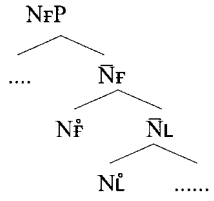
name / feature status	typography			
	[-P,-M] Head: °	[+P,-M] Intermed: $\bar{X}$	[+P,+M] Maximal: XP	[-P,+M] Particle: X°P
functional ([+F,+G]): F	X°_{F}	$\bar{X}_{F}$	$X_{F}P$	$X^{\circ}_{F}P$
semi-lex. ([αF,-αG]): s	X°_{s}	$\bar{X}_{s}$	$X_{s}P$	$X^{\circ}_{s}P$
lexical ([-F,-G]): L	X°_{L}	$\bar{X}_{L}$	$X_{L}P$	$X^{\circ}_{L}P$

By way of illustration, consider the following standard[37] DP-tree with its translation into the new typography.

(78) a.



b.



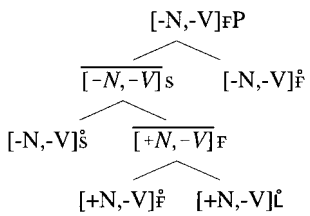
Returning now to the issue of prepositional phrases, consider the idea that the transition between a nominal projection and its prepositional shell does not involve a maximal projection node. More concretely, this amounts to attributing to a prepositional phrase such as (79)a the structure given in (79)b.

[36] The system as sketched may well be too rich in that it allows for maximal phrases and particle phrases for every type of head. I leave the matter open for the time being.

[37] Standard, that is, in the system developed in section 2.

(79) a. auf den Berg hinauf
on the mountain up

b.



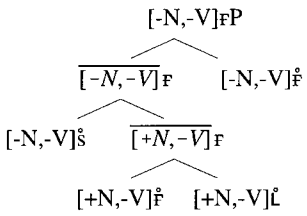
While this is a single projection (an E-M-Projection, to be precise) in the sense that there is only one maximal projection node, it is not a well-formed projection in that two of the well-formedness conditions in (7), the CIT and the NVR are violated. The NVR is violated because of the transition from $\overline{[+N, -V]}_F$ to $\overline{[-N, N]}_S$ in which the value for one of the Functionality features goes from '−' to '+', [+F] to [−F], or [+G] to [−G], depending on whether the semi-lexical preposition is taken to be [+F, −G] or [−F, +G]. The CIT is violated by the same transition because of the categorial switch from [+N] to [−N]. Notice, however, that the former violation is easily avoided by assuming that it is not the Functionality features of the semi-lexical head which are projected to the next higher node but rather the Functionality features from the nominal part of the projection. In other words, the structure given in (79)b should be replaced by (80).[38]

[38] The replacement of (79)b by (80) is by no means unproblematic, however. In particular, allowing the functionality value of the semi-lexical head to be recessive in the sense that it need not percolate to the dominating node may well be too powerful a tool because it permits free interspersion of functional and semi-lexical heads. A more restrictive theory would say that the semi-lexical shell is external to the lexical head but always internal to the functional shell. I believe the more restrictive view to be by and large empirically correct, as far as I can tell, though the discussion in connection with the examples (44) and (45) might suggest otherwise. Perhaps the best strategy here would be to say that semi-lexical heads can only be recessive when they extend a projection, that is at a licit categorial transition point in a projection, but I will not attempt a revision of the NVR condition that would have this result. On the issue of percolation of features in M- and E-projections, see also footnote 16 above.

One other aspect that should be addressed is the fact that the system predicts that several semi-lexical heads can be present in a single (M-)Projection, though no such examples have been given. The fact of the matter is that recursion of semi-lexical heads appears to be exceedingly rare. I feel it is safe, however, to attribute this fact to the listedness property noted in connection with direct partitives and also found in qualificational constructions. Nevertheless, limited recursion is not excluded entirely, as the following examples suggest:

(i) een blad glazen wijn ('a tray glasses wine')
(ii) een krat halfvolle flesjes cola ('a case half full bottles coke')

(80)



Turning now to the CIT violation, what I would like to suggest is that the CIT should be slightly modified to allow such a transition. Before turning to a reformulation, however, observe that it should also take into account the possibility of having a CP shell around IP, which is now $\overline{[-N, +V]}$F. To simplify matters somewhat, let us list the twelve transitions that are logically possible.

(81)

1	2	3	4	5	6
[+N,-V] | [-N,+V]	[-N,+V] | [+N,-V]	[+N,-V] | [+N,+V]	[+N,+V] | [+N,-V]	[-N,+V] | [+N,+V]	[+N,+V] | [-N,+V]
N | V	V | N	N | A	A | N	V | A	A | V
7	8	9	10	11	12
[-N,-V] | [+N,+V]	[+N,+V] | [-N,-V]	[-N,-V] | [+N,-V]	[+N,-V] | [-N,-V]	[-N,-V] | [-N,+V]	[-N,+V] | [-N,-V]
P | A	A | P	P | N	N | P	P | V	V | P

As things stand, it is the more darkly shaded boxes that should be exempted from the CIT. Furthermore, in accordance with the remarks in footnote 34, the more lightly shaded boxes should be exempted as well. Consider other possible exemptions. It might be tempting, in fact, to adapt the system to allow for mixed or transcategorial constructions. Among the most obvious candidates are gerunds. Abney (1987) indeed suggests that gerunds should be analyzed as VPs with a DP shell. Grimshaw (1991) correctly notes that Abney's proposal is in conflict with the CIT. Her solution is to consider *-ing* an intermediate category neutral element that facilitates the transition. In our nascent system, this would mean that *-ing* should be considered a (bound) preposition. In other words, the verbal interior of the gerund turns into (non-maximal) P by the head *-ing*, a transition of type 11 in (81), and then is turned into a DP by the head D, a transition of type 10 in (81). An illustration is given

in example (88) below. We will not pursue the matter of these and other mixed projections at this point, however.

Consider now the appropriate revision of the CIT. Assuming that the CIT should now exclude cases 1 through 8, the following is a formulation that suggests itself.

(82) **CIT** (revised version):

Within a projection, the following well-formedness condition holds:

*[αN, βV] (where α, β, γ, δ range over + and −)
|
[γN, δV]

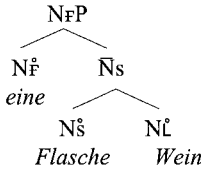
unless either (i) $\alpha = \gamma$ and $\beta = \delta$

or (ii) at most one of α, β, γ, δ has the value +.

In this definition, clause (i) defines (M-)Projections, while clause (ii) now gives a formal characterization of the (expanded) projection which we can call E-projection, though this term invites confusion with Grimshaw's notion of extended projection.

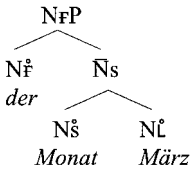
Before turning to the question of finding a rationale behind this way of characterizing projections, let us briefly stop to illustrate the main semi-lexical construction types discussed here. The following trees exemplify the German DPC, the French Pseudo-DPC, the Finnish partitive, the Lezgian subelative and the English gerund respectively. I give the examples with the simplified labels introduced above, so the reader will have to verify the well-formedness of these examples with respect to the CIT and the NVR by translating the atomic category labels into the corresponding representation in terms of the categorial features and by translating the other diacritics into the corresponding functionality and level features respectively.[39]

(83) German DPC: eine Flasche Wein ('a bottle wine')

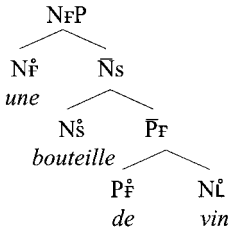


[39] In the examples given below, the position of the bound functional heads is chosen rather arbitrarily. I have no way at present to determine, for example, whether the functional prepositional head containing the partitive case marker *-a/-ä* is on the left or on the right. A theory such as Kayne (1994) about the overall direction of movement, and of adjunction in particular, might ultimately decide the matter.

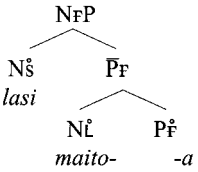
(84) German QC: der Monat März ('the month of March')



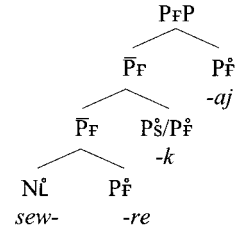
(85) French Pseudo-DPC: une bouteille de vin ('a bottle of wine')



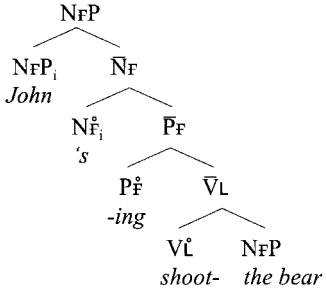
(86) Finnish partitive case: lasi maito-a ('(a) glass milk$_{PART}$')



(87) Lezgian subelative:[40] sew-re-k-aj ('from under the bear')



(88) English Gerund: John's shooting the bear



[40] I am assuming here that the locative head can be either purely functional, as in cases in which the whole PP functions as a subcategorized argument, and as a semi-lexical head in case the PP is an adjunct. Hence the notation $P^{\circ}_{S}/P^{\circ}_{F}$.

5. Unifying the CIT with the Unlike Feature Constraint: some speculations about Feature Magnetism

In conclusion, let us consider again the status of prepositional elements in the conception of E-projections developed in this article. The point of departure was the idea that projections are characterized by categorial identity, expressed in the Categorial Identity Thesis (CIT). In order to accommodate various extensions of projections involving prepositional elements (complementizers, functional prepositions, semantic case, gerunds, etc.), a revised version of the CIT was proposed in (82), repeated here as (89).

(89) **CIT** (revised version):
Within a projection, the following well-formedness condition holds:

$$*[\alpha N, \beta V] \quad \text{(where } \alpha, \beta, \gamma, \delta \text{ range over + and } -\text{)}$$
$$|$$
$$[\gamma N, \delta V]$$

unless either (i) $\alpha = \gamma$ and $\beta = \delta$
or (ii) at most one of $\alpha, \beta, \gamma, \delta$ has the value +.

What this formulation intends to express is that prepositional elements, by virtue of the fact that they do not have the positive value for either of the two categorial features, act as neutral, invisible, skippable elements with respect to the overall principle that forces categorial uniformity within a single projection.

There is, I believe, a more encompassing generalization to be made here. The revised CIT, as formulated in (89), is in fact conceptually (though not, for the time being, formally) the mirror image of another principle that governs the coexistence of categorial features in syntactic structures. This principle, proposed in Van Riemsdijk (1988), is the Unlike Feature Constraint (UFC). The UFC is designed to regulate the distribution of phrasal categories within larger syntactic contexts. Its antecedents include Stowell's (1981) Case Resistance Principle, Kayne's (1982) suggestions about the alternation between predicates and arguments, and the Unlike Category Condition (UCC) proposed in Hoekstra (1984).

Hoekstra's UCC states that no head can govern a phrase of the same category. In other words, verbs cannot take purely verbal complements, nouns cannot govern noun phrases etc. In my article, I criticize Hoekstra's proposal on the grounds that the UCC is both too strong and too weak. It is too weak in that it fails to exclude AP being governed by V, N or A. It is too strong in that it incorrectly excludes prepositions governing PPs, a configuration widely attested in examples like *until after the war, from behind the garage*. What I argued in my (1988) article was that while the idea of the UCC was on the

right track, it should be replaced by a principle, the Unlike Feature Condition (UFC), which is sensitive not to the atomic category labels but to the positive values of the categorial features. The point was that P and PP seemed to be the most versatile category in that they enjoy the greatest freedom in terms of any general constraints on their distribution. This then was attributed to their not being positively specified for either of the categorial features.

The UFC was formulated as follows:[41]

(90) **The Unlike Feature Condition (UFC)**:

$$* \{ [+F_i]^\circ [+F_i]P \} \quad \text{where } F_i = N \text{ or } V$$

Despite the superficial dissimilarity of the UFC and the CIT, there is an unmistakeable conceptual resemblance. The idea seems to be that within a projection we have categorial cohesion or attraction between likes, whereas outside a projection we find repulsion of likes, a kind of magnetism in which the positively specified features attract one another internal to a projection but repel each other externally. In both instances it is the prepositional elements which are unaffected by this magnetism from which they escape by virtue of their being negatively specified for both features.

If this is conceptually on the right track, we might attempt to unify the CIT with the UFC. In trying to do so, consider first, for each of the two constraints, a table, parallel to (81), of what should be allowed and what should be excluded. Note, however, that (81) was incomplete in that it only listed the transitional cases. Consider first, then, the revised table for the CIT. This can be given as in (91), where the two category labels dominating one another should be taken to mean that the upper one has a higher level value than the lower one. In other words, stated in terms of the features [±P(roj)] and [±M(ax)], this is the case where [+P] » [−M] (where '»' is defined as immediate domination). For the sake of transparency, however, the abbreviated labels are given without the functionality and level features. In the formulation of the CIT given in (89), the four non-shaded cells on the diagonal are exempted by clause (i), and the four remaining non-shaded cells are exempted by clause (ii).

[41] The curly brackets stand for a government domain in which we abstract away from the relative order between the head and the complement. It should be noted that the article as it appeared had not been proofread and contained a large number of typographical errors, including the fact that in the formulation of the UFC given in (90) the nominal category feature was labelled 'M' rather than 'N.'

(91) CIT (shaded cells are those to be excluded by the constraint)

N | N	[+N,-V] | [+N,-V]	N | V	[+N,-V] | [-N,+V]	N | A	[+N,-V] | [+N,+V]	N | P	[+N,-V] | [-N,-V]
V | N	[-N,+V] | [+N,-V]	V | V	[-N,+V] | [-N,+V]	V | A	[-N,+V] | [+N,+V]	V | P	[-N,+V] | [-N,-V]
A | N	[+N,+V] | [+N,-V]	A | V	[+N,+V] | [-N,+V]	A | A	[+N,+V] | [+N,+V]	A | P	[+N,+V] | [-N,-V]
P | N	[-N,-V] | [+N,-V]	P | V	[-N,-V] | [-N,+V]	P | A	[-N,-V] | [+N,+V]	P | P	[-N,-V] | [-N,-V]

Consider now the UFC. In order to optimally bring out the parallelism, consider first the table showing what should be excluded by the UFC. This table is given here as (92).

(92) UFC (shaded cells are those to be excluded by the constraint)

N | N	[+N,-V] | [+N,-V]	N | V	[+N,-V] | [-N,+V]	N | A	[+N,-V] | [+N,+V]	N | P	[+N,-V] | [-N,-V]
V | N	[-N,+V] | [+N,-V]	V | V	[-N,+V] | [-N,+V]	V | A	[-N,+V] | [+N,+V]	V | P	[-N,+V] | [-N,-V]
A | N	[+N,+V] | [+N,-V]	A | V	[+N,+V] | [-N,+V]	A | A	[+N,+V] | [+N,+V]	A | P	[+N,+V] | [-N,-V]
P | N	[-N,-V] | [+N,-V]	P | V	[-N,-V] | [-N,+V]	P | A	[-N,-V] | [+N,+V]	P | P	[-N,-V] | [-N,-V]

The hierarchical relation between the upper label and the lower label should be taken to mean that the first node dominating the governor, a node of type [+P, −M] immediately dominates the governed phrase, a node of type [+P, +M], or, more succinctly, [−M] » [+M]. This is simply another way of expressing the government relation holding between a head and a phrase.[42] Again the level features are omitted from the table for expository reasons.

[42] What this says is that a complement phrase need not be a sister to the lexical head because there can be several nodes of the type $\bar{X}_L$ on top of one another. However, this formulation may still be too restrictive in view of the possibility that scrambling is not movement but base generation. The latter option would imply, in fact, that the domain of theta-identification or

For the empirical considerations supporting this way of mapping out the possible and impossible configurations across maximal projection boundaries, the reader is referred to Van Riemsdijk (1988). It should be noted, however, that not every choice made in table (92) is entirely unproblematic. This is particularly true for the next to last cell in the bottom row, i.e. P»A. There are two reasons for considering this to be a legitimate structure. On the one hand, there are cases like the following (from Emonds (1985)).

(93) a. He suddenly changed from sad to radiantly happy
b. Mary took John for sensitive

On the other hand, there is the essential symmetry along the diagonal (upper left to lower right) axes in the tables (91) and (92). And since there is little doubt that adjectives can take PP-complements, the inverse property, prepositions taking AP-complements should also hold.

Let us now try to find a formulation of the UFC which is similar to that given for the CIT in (89) above. We could say that again two subclauses are required, one which states that the configuration is excluded unless at most one of α, β, γ, δ has the value '+', and one which states that it is excluded unless either $\alpha \neq \gamma$ and $\beta \neq \delta$. The former clause is identical to clause (ii) of (89) while the latter clause is in some sense the reverse of clause (i) of (89). This brings us to the following formulation.

(94) **UFC** (revised version):
Across a projection, the following well-formedness condition holds:

$$\begin{array}{l} *[\alpha \mathrm{N},\ \beta \mathrm{V}] \\ \quad\ | \\ \quad [\gamma \mathrm{N},\ \delta \mathrm{V}] \end{array}$$

(where α, β, γ, δ range over + and −)

unless either (i) $\alpha \neq \gamma$ and $\beta \neq \delta$
or (ii) at most one of α, β, γ, δ has the value +.

In order to collapse the two principles into one, the informal notions 'within a projection' and 'across a projection' have to be formalized. There are four relevant types of nodes to consider, X° (head), $\overline{\mathrm{X}}$ (intermediate node), XP (maximal projection node) and X°P (particle), as defined in (77). This means that there are sixteen logically possible domination configurations, which can be represented in the following table.

theta-deployment extends into the semi-lexical and even functional part of the projection. If that is correct, then the L should be dropped from the node label. The table will then pertain to all cases in which $\overline{\mathrm{X}}$ dominates YP, regardless of the functionality value. I will not pursue the ramifications of this choice here. The formulations of the principles given below will be neutral with respect to the value of the functionality feature.

(95)

[+P,+M]				[+P,-M]			
XP | X°	XP | $\bar{X}$	XP | XP	XP | X°P	$\bar{X}$ | X°	$\bar{X}$ | $\bar{X}$	$\bar{X}$ | XP	$\bar{X}$ | X°P
[-P,-M]	[+P,-M]	[+P,+M]	[-P,+M]	[-P,-M]	[+P,-M]	[+P,+M]	[-P,+M]
[-P,-M]				[-P,+M]			
X° | X°	X° | $\bar{X}$	X° | XP	X° | X°P	X°P | X°	X°P | $\bar{X}$	X°P | XP	X°P | X°P
[-P,-M]	[+P,-M]	[+P,+M]	[-P,+M]	[-P,-M]	[+P,-M]	[+P,+M]	[-P,+M]

Of the sixteen possibilities listed here, the ten shaded ones can be eliminated on independent grounds having to do with the intrinsic content of the level features. In effect, the bottom half of the table can be discarded because we take [−P] to mean that the elements in question are terminals, nodes that cannot dominate anything else. This is, after all, the meaning of 'head,' and particles are taken to be head-like in the same sense. Similarly, we can take [+M] to mean maximal in an absolute sense. Hence, a maximal node will not be allowed to dominate another one that is also specified as [+M].[43] This leaves six cases to be considered, the non-shaded cells in the table above. All of them have [+P] as the upper node. The bottom node, however, is [−M] in four of the cases, while the remaining two have the bottom node [+M]. Observe, now, that the [−M] cases are those that are relevant to the CIT, while the [+M] cases correspond to the UFC.

We may now state the two conditions as a single principle, albeit one that still has a disjunction in it. Let us call this principle the Law of Categorial Feature Magnetism (LCFM).

(96) **Law of Categorial Feature Magnetism (LCFM)**:

A configuration	$[\alpha\text{N}, \beta\text{V}]_C \cup L_\text{i}$	(where $\alpha, \beta, \gamma, \delta$ range over +
	|	and −, [+P] ⊂ L_i,
	$[\gamma\text{N}, \delta\text{V}]_C \cup L_\text{j}$	and [±P, ±M] ⊆ L_j)
is illicit (*) unless:	(i) at most one of $\alpha, \beta, \gamma, \delta$ is '+'	
or	(ii) 1. if [−M] ⊂ L_j, then $\alpha = \gamma$ and $\beta = \delta$,	
	2. if [+M] ⊂ L_j, then $\alpha \neq \gamma$ and $\beta \neq \delta$	

[43] This excludes various base-generated adjunction structures, in particular heads dominating heads and maximal phrase nodes dominating maximal phrase nodes. I assume that the former may exist, but not at the level of syntax but only in the morphology. The latter I also take to be excluded on principled grounds, thereby eliminating certain options that are often thought to be instantiated by relative clauses, for example.

While this way of putting things is reasonably straightforward, there is at least one disadvantage in that clause (ii) contains two subclauses which are logically conjunctive. An equivalent but somewhat simpler way of saying the same thing would be the one given in (97).[44]

(97) **Law of Categorial Feature Magnetism** (revised version):

A configuration	$[\alpha\text{N}, \beta\text{V}]_C \cup L_\text{i}$	(where α, β, γ, δ range over +
	|	and −, [+P] $\subset L_\text{i}$,
	$[\gamma\text{N}, \delta\text{V}]_C \cup L_\text{j}$	and [±P, ±M] $\subseteq L_\text{j}$)
is illicit (*) unless:	(i) at most one of α, β, γ, δ is '+'	
	or	
	(ii) if $[-\text{M}] \subset L_\text{j}$, and $\alpha = \gamma$ and $\beta = \delta$,	
	or	
	(iii) $[+\text{M}] \subset L_\text{j}$, and $\alpha \neq \gamma$ and $\beta \neq \delta$	

This is the closest approximation to a unified principle that I am am able to give at this point.[45] The symmetry and simplicity of the LCFM as it now stands is encouraging, however, and I feel that it may well be possible to achieve a further simplification of it before long.

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[44] Thanks to Riny Huybregts and Elias Thijsse for helping me eliminate an error contained in an earlier version of the LCFM and to Elias Thijsse for suggesting the revised formulation to be given below.

[45] It might be tempting to try to also incorporate the No Value Reversal (NVR) condition into the unification. It is less clear to me that there is a real conceptual link here, however. At any rate, the unification of the CIT and the UFC seems to me to offer more immediate promise and should therefore have higher priority.

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