A MULTIPLE SPECIFIER APPROACH TO LEFT-PERIPHERAL ARCHITECTURE

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In this paper I show that on closer inspection, implementing a cartographic approach to clausal architecture as a minimalist analysis proves to be problematic. I propose an alternative analysis of the C-domain as a single CP with multiple specifiers; ordered merge operations result from hierarchy-driven satisfaction of a feature hierarchy in C^o. Some seeming counterevidence comes from languages in which left-peripheral heads seem to be overtly marked. However, I present arguments in favour of the view that these markers are not syntactic heads, but affixes on the displaced constituent. Furthermore, I argue that sentence-initial complementisers followed by C-material are best analysed as a morpho-phonological phenomenon at the CP edge. They are dealt with within the framework of Distributed Morphology. Cross-linguistic variation in the phonological realisation of C-markers is accounted for by means of optimisation.

1 Introduction

The cartographic approach is arguably currently the prevalent approach to clausal architecture. The motivation behind this account is what can be called the Principle of Local Simplicity as given in (1):

(1) **Principle of Local Simplicity** (see Rizzi 2004:8)
Natural languages favour local simplicity, and accept paying the price of ending up with global representations involving very rich articulation of functional structures.

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Strictly cartographic implementations realise (1) as a background assumption on the nature of functional heads, which is given in (2):

(2) **Feature Singularity** (see Rizzi 2004:8)
Functional heads enter the derivation as the representation of exactly one syntactically relevant feature.

A second assumption at the basis of cartographic approaches is that Ā-movement of elements such as focus or topic phrases is driven by a respective semantic feature such as [foc] or [top]. If (1) holds, then any displaced phrase ends up as the single specifier of a distinct left-peripheral functional projection. Third, it is widely assumed that the order of functional projections is universally fixed, and that the entire structure is present cross-linguistically and in all sentence types.

One consequence for clausal architecture is a radically decomposed C domain with each clausal function of C being analysed as a distinct head (Force°, Fin° etc.). A second consequence is that each functional head can merge one specifier at most. Thus, what is generally called the C domain is taken to be an abbreviation for a system of stacked functional projections. These XPs are assumed to appear in an ordered way such that those XPs representing the clausal functions of C (ForceP, FinP) delimit the C system upward and downward, and XPs representing information-structural specifications of C (TopP, FrameP etc.) are "sandwiched in between" (Rizzi 1997:288).

The main goals of this paper are to show that on closer inspection, implementing this approach as a minimalist analysis proves to be problematic, and to propose an alternative analysis of the C domain as a singular CP with multiple specifiers.

I will proceed as follows. In section 2, I discuss a number of conceptual arguments against implementing the cartographic approach in a minimalist system. In section 3 I propose a minimalist alternative making use of a singular CP with multiple specifiers. In section 4, I contrast split-C and CP analyses with regard to empirical predictions, including cases of overt marking in the C domain. Section 5 offers a solution for the problem of complementisers preceding left-peripheral material.

2 Conceptual Arguments Against a Multiple Head Approach

2.1 Phases and Phase Impenetrability

Merge of constituents in the C domain is an instance of Ā-movement and as such initiated by the phase head (Chomsky 2005, 2006). The first difficulty which comes up here is the question of which head is actually the phase head in a C layer consisting of multiple heads. I will argue below that regardless of which head is actually assumed to be the phase head, any choice finally leads back to the same complication. For the time being, let us assume that the phase head is Force^{o} (following the tests for phasehood put forth by Chomsky (2000, 2005) and Matushansky (2003), among others, it might be concluded that what is dominated by ForceP has the status of a proposition). However, if this is so, then Ā-movement cannot create positions lower than the phase edge by yielding specifiers of lower C heads (Foc, Top, Wh etc.).

One possibility to come by this obstacle might be to assume that feature inheritance takes place, with Force^{o} handing down the [top], [foc], [wh] and other features to the respective heads. Such an assumption is problematic in more than one way. Firstly, if condition (2) is to be taken seriously, then Force^{o} (or any head assumed to be the phase head) does not have more than one feature to hand down. Secondly, feature inheritance and the motivations behind it (Chomsky 2006) have implications for clausal architecture that are potentially conflicting with cartography-based approaches, as has been noted by Richards (2006): feature inheritance is a way out of the dilemma of how uninterpretable features of a phase head Φ can be transferred to the semantic component as soon as they are valued, while Φ itself must be carried over to the next phase. Φ therefore needs a non-phase head N to discharge its uninterpretable features; however, it needs exactly *one* N. The existence of more than one non-phase head is therefore not motivated by the Strong Minimalist Thesis, which states that language is an optimal solution to legibility conditions (Chomsky 2000:96; Richards 2006:11f.).

If this rationale is on the right track, then sequences of N - N or Φ - Φ on the spine of the syntactic derivation are out, and only sequences of the type Φ - N - Φ - N are possible. This necessity could still be integrated into a cartographic architecture by assuming that phase heads and non-phase heads occur by turns in a fine-grained clause structure, so that a single derivation involves a high number of phase heads. This might not seem to be such a high price at first glance, but one should take into account the fact that derivation by phase enforces successive-cyclic movement of constituents. Thus, to derive

a seemingly trivial sentence like (3), one would then be forced to postulate a number of intermediate traces that results from the number of postulated backbone projections divided by two.

(3) Which film are you watching?

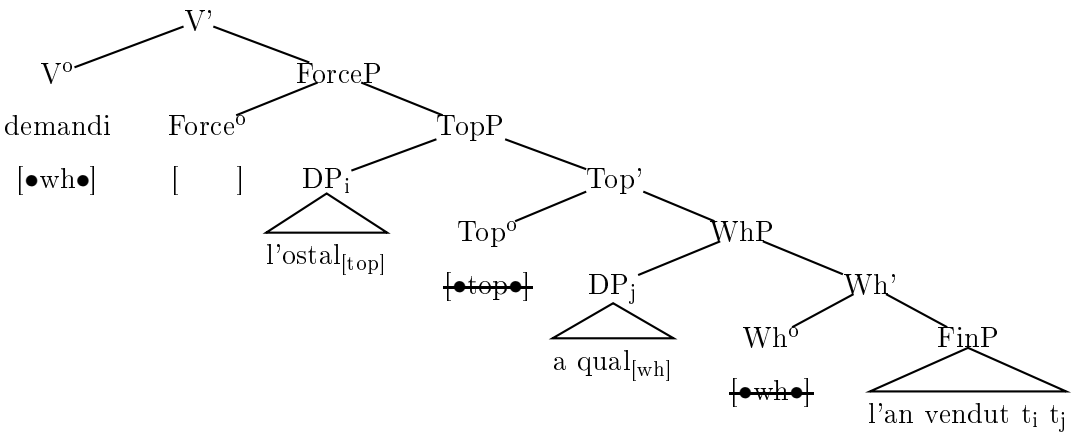
The high number of phases/ lexical subarrays that have to be postulated under this assumption significantly increases the computational burden while doing the same job as a simple C-v (T-V) phase system. The number of phases therefore has to be reduced in a certain manner, which ultimately boils down to the null hypothesis that the number of phases is restricted to the core functional categories of the clausal skeleton (Chomsky 2001, 2005; see also Kawashima and Kitahara 2004).

2.2 C-Selection

Newmeyer (2004) explores a number of inconsistencies contained in Split-C analyses. A problem which seems especially serious to me is the following (Newmeyer 2004:410f.): It is a widely accepted generalisation that C^o is made up of information about the sentence type (declarative, interrogative etc.). In a stacked C layer it is Force^o that delivers this information and can therefore be selected by a higher verb. However, this generalisation is lost if wh-elements are located in a lower position SpecFoc or SpecWh, as the system does not guarantee that wh-features in Foc^o are visible for a higher selector. For example, take a sentence like (4) from Occitan, of which the structure is given in (5).

(4) Me demandi [l'ostal]$_i$, [a qual]$_j$ l$_i$'an vendut t$_i$ t$_j$ (Lahne 2005)
me ask DET.house PRT whom it.have.3PL sold
'I wonder to whom they sold the house'

(5)



There are at least three ways of how the sentence type feature of Force^{o} can have been dealt with: (i) Agree with/get valued by V, (ii) Agree with the [wh] feature of the DP in SpecWh, (iii) set default value 'decl'. Optimally, Force^{o} agrees with [wh] before it satisfies the feature specification of the higher verb; otherwise, sentence type marking would take place independently of the observed wh-movement. As a consequence, sentences like (6b) would not be ruled out.

(6) a. Anna thought Alexa asked whom they finally elected president
b. * Anna asked [$_{\text{Force}^{o}}$ [wh]] Alexa thought [$_{\text{Force}^{o}}$ [decl]] whom they finally elected president

It is therefore a requirement that the features of Force^{o} be satisfied by the lower wh-element before the higher V is merged. However, exactly this is not predicted from the constellation in (5): the system has no mechanism that ensures Agree over Merge, as the lower [wh] feature doesn't act as a probe anymore once the wh-element is internally merged. The relevant sentence type feature is therefore potentially invisible for higher selectors (unless additional assumptions are made).

2.3 Multiple Specifiers

In strictly cartographic analyses the format of phrase structure is limited in accordance with the LCA (Kayne 1994), thus restricting the number of possible specifiers of a head to one. However, a minimalist analysis that employs a version of phase theory cannot dispense with the multiple specifier hypothesis (Chomsky 1995, 2005). The reason for this lies in the nature of successive-cyclic movement itself: XP movement involves internal merge of the displaced element with ϕ' (where ϕ is the phase head). Consequently, if n XPs are to be extracted from the phase, then ϕ merges $\geq n$ specifiers. This becomes apparent in constructions involving multiple dislocates like the following from Occitan (Lahne 2005:49):

(7) Cresi [de castanhas]$_{i}$, [AL PÒRC]$_{j}$ que ne$_{i}$ dona t$_{i}$ t$_{j}$
think.1SG DET chestnuts TO.THE PIG that of.it give.3SG.FUT
'I think the chestnuts he'll give TO THE PIG'

An approach resting upon an explicitly stated ban on multiple specifiers can therefore not be maintained in a phase model (see Chomsky 1995, 2005). Interestingly, abandoning the LCA does not entirely solve the problem, as multiple specifiers are doubly excluded in the cartographic approach by the assumption

of feature singularity. Before developing the argument, let me briefly explore how syntactic relevance is defined for a given feature. Following Svenonius (2006), I assume a feature to be syntactically relevant if it constitutes a distinction between two different syntactic representations, thus either a syntax-internal feature (i.e., a syntax feature and not a feature of any other module), or a syntax-X interface feature (thus a syntax feature and a feature of a module X). In what follows, I will presuppose that this definition is essentially what is meant by "syntactically relevant" in Rizzi (2004:8).

If the LCA is given up as a background assumption, then the system allows for multiple specifiers, but this option is still restricted by the condition on feature singularity: heads with one syntactically relevant feature cannot merge more than one specifier. At first sight, the problem that multiple specifiers are needed for multiple extractions from a phase could be bypassed now by assuming that movement to the phase edge for reasons of successive cyclicity is driven by an edge feature which is inserted during the derivation, violating Inclusiveness (see the optional EPP feature condition in Chomsky 2000:109, Chomsky 2001:34, or Phase Balance in Heck and Müller 2000). However, the irregularity thus created - multiple specifiers are generally licit, but they cannot occur with functional heads unless created by a specific operation - reflects a deeper asymmetry of the system, which is potentially conflicting with minimalist background assumptions. I address this issue in more detail in the following section.

2.4 Feature Singularity and Syntactic Derivation

The condition on feature singularity given in (2) creates an asymmetry in the typology of heads: it does not disallow originally complex (functional or lexical) heads in general as far as syntactically non-relevant features are concerned, and, technically, it does not exclude complexes of syntactically relevant features on lexical heads. It bans, however, functional heads made up of more than one syntactic feature. This assumption is problematic in two ways. Firstly, there is no independent motivation for this asymmetry. Secondly, just the kind of head that is ruled out by (2) seems to be needed to account for locality effects in the left periphery. Consider the following example:

(8) a. ? [Quale problema]$_i$ non sai come$_j$ risolvere t_i t_j?
which problem not know.2SG how solve
'Which problem don't you know how to solve?'

b. * Come$_j$ non sai [quale problema]$_i$ risolvere t_i t_j?
how not know.2SG which problem solve
'*How don't you know which problem to solve?'

It is a well-known observation that discourse-linked wh-elements can be extracted from weak islands, as shown in (8). The analysis of this phenomenon put forth by Rizzi (2006) crucially rests upon the assumptions that this locality effect can be best explained by intervention, and that intervention depends on full matching of the feature specifications of intervener and higher attractor (Starke 2001). With D-linking being syntactically represented by a feature [top], discourse-linked wh-elements have a feature specification [Q], [top]. Both the embedded and the matrix CP are internally structured, involving Force, Top, Foc, Q and Fin phrases. When the higher left periphery (LP_1) is being built up, then Q^o_1 raises to the higher head Top^o_1. This derivationally created complex head attracts the D-linked wh-element. The absence of locality effects is due to the fact that there is no element between Probe and Goal which fully matches the feature specification of the extracted element.

There are a number caveats to this analysis. Firstly, the assumption of feature singularity considerably increases the complexity of the system: it creates a typological asymmetry which has to be repaired by postulating a movement operation that is not feature-driven (as Q cannot have more than one syntactically relevant feature) and that violates the Earliness Principle (Pesetsky 1989), which is an independently well motivated assumption underlying minimalist derivations (see Chomsky 2000, 2001). Secondly, (2) contains a strong implication for Split-C solutions which is problematic not only in a minimalist model: assuming that functional heads are made up by exactly one syntactic feature entails that if a head α is attracted by the single syntactically relevant feature [$\bullet\alpha\bullet$] of a functional head β, then β cannot merge a specifier, as a second syntactic feature would be needed to trigger XP movement.[1] However, if that were so, then XP movement could never be triggered by derivationally complex heads (i.e., head movement blocks XP movement, and vice versa), which would put a halt to the computation as soon as the verb is raised to v.

In addition, the analysis contains two arguable points, which I will not discuss in detail: firstly, the system as presented in Rizzi (2006) does not

1. This argument works under the condition that movement is assumed to be a feature-driven syntactic operation, and that Inclusiveness holds. The alternative would be to devise a system in which movement is not feature-driven or not syntactic (in which case movement would simply no be feature-driven), or in which any internal merge is due to an inserted edge feature (compare Chomsky 2000:109, Chomsky 2001:34, Heck and Müller 2000).

prevent Q-to-Top raising in the embedded clause. Secondly, the goal too has to be conform with the assumption of feature singularity - if it is a functional category (e.g., a DP), then its complex feature specification cannot originate from a single head. However, all the features involved in the Attract/Agree operation have to be assembled on the closest node.

3 An Alternative Analysis

One possibility of saving Split-C and at the same time avoiding the problems mentioned so far might be to assume a system which includes an articulated C domain *plus* multiple specifiers, and model a mechanism which somehow compresses the multiple left peripheral heads into one single instance of C°. The "folding" would have to apply both for Ā-movement (possibly involving an amendment of the phase notion), and for C-selection (to ensure visibility for higher selectors). A second alternative is to abandon the view of a split C domain and assume a structure in which we get all the effects observed above for free. I propose a solution that is arguably in line with the one sketched in Chomsky (2005:9):

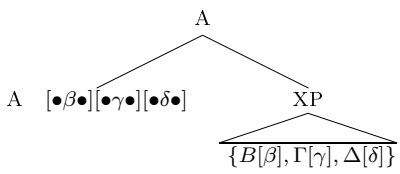
> C is shorthand for the region that Rizzi (1997) calls the "left periphery", possibly involving feature spread from fewer functional heads (maybe only one).

The basic ideas proposed here are the following: The C domain consists of a singular C projection; C° is made up of a hierarchy of features, and dislocated elements are specifiers of C. I formulate this approach in detail in the following section.

3.1 The Structure Building Mechanism

Let (9) be a given construction:

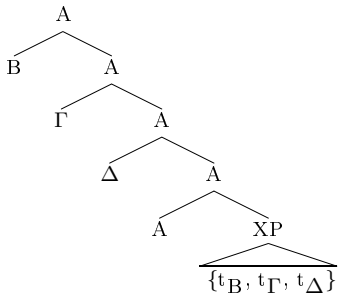
(9)



Let the features in A be Attract features[2], and let A trigger ordered internal merge operations[3] with an order of merge as given in (10):

2. I adopt the notation of attracting features as bulleted from Heck and Müller (2005).
3. (See Chomsky 1993:28). Ordered merge operations are especially evident in double object constructions, in which the direct object is first merge, and the indirect object is second

(10)



The question now is, what triggers the ordered Merge operations observed here, i.e., what determines that in this derivation [•δ•] is satisfied first, then [•γ•], and then [•β•]? In what follows, I will devise an analysis according to which ordered Merge is due to a hierarchical ordering of probe features and hierarchy-driven feature handling. The background assumptions needed to model the derivational system are formulated in (11) to (13).

Assumption I: Conditions on Hierarchical Feature Mapping

(11) For each functional head there is an associated hierarchy of functional features (HFF) such that the input to merge must respect HFF.[4]

(12) a. Numeration building comprises a mapping process M.
b. For a given head Λ, 'Λ enters the numeration' is defined as 'M applies to the HFF associated with Λ'.
c. M selects features from HFF, yielding a feature hierarchy HFF' for which (i) and (ii) are true:
(i) HFF' is contained in HFF.
(ii) HFF' retains the hierarchical feature ordering of HFF.
d. As an outcome of M, the numeration contains a functional head Λ made up by a feature hierarchy HFF' $[F_1] > [F_2] > ... > [F_n]$.

Assumption II: Condition on Hierarchy-driven Derivation

(13) a. A feature [F] of a head Λ is to be satisfied at a point P of the derivation iff. (i) and (ii):
(i) Λ is the active head.
(ii) [F] is the active feature.
b. **Active head** (see Chomsky 1995:176ff.)
A head is active at a point P of the derivation iff. it is a Probe at P.
c. **Active feature**
A feature is active at a point P of the derivation iff. it is the highest unsatisfied (unchecked/ unvalued) feature in the feature hierarchy of an active head at P.

merge (Larson 1988).
4. See Biskup 2006, Starke 2001.

Consequently, if (9) and (10) are part of the same derivation, the feature hierarchy of A is $[\bullet\delta\bullet] > [\bullet\gamma\bullet] > [\bullet\beta\bullet]$. This hierarchical order of features in A is the reason for the ordered merge operations visible in (10).

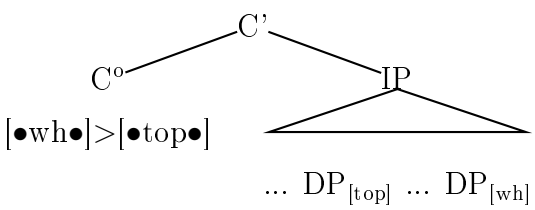
3.2 Building up the C Domain

In this section I show how the structure building mechanism introduced in section 3.1 is implemented to model left peripheral structure build-up.

There is a HFF which is projected as C. M selects features from HFF, and sends the resulting HFF' to the numeration. HFF' is contained in HFF, and retains the hierarchical feature ordering of HFF. In one possible instantiation of the C head, the numeration now contains a functional head C made up by a feature hierarchy $[\bullet\text{wh}\bullet] > [\bullet\text{top}\bullet]$.

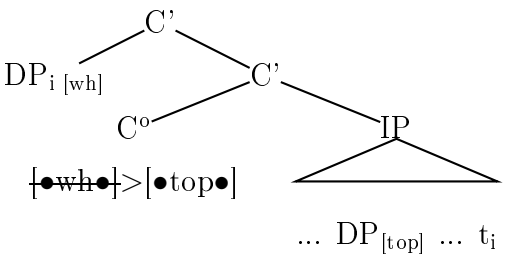
At a point P in the derivation, C is merged, bearing the HFF' $[\bullet\text{wh}\bullet] > [\bullet\text{top}\bullet]$. C is now the active head, which means that its features have to be satisfied immediately; $[\bullet\text{wh}\bullet]$ is the active feature as it is the highest unsatisfied feature in the feature hierarchy of C. There are two DPs bearing the features [top] and [wh], respectively, deeper in the structure:[5]

(14)



The Attract feature $[\bullet\text{wh}\bullet]$ of C is satisfied by internally merging $\text{DP}_{[\text{wh}]}$ with C'. Now $[\bullet\text{top}\bullet]$ is the active feature.

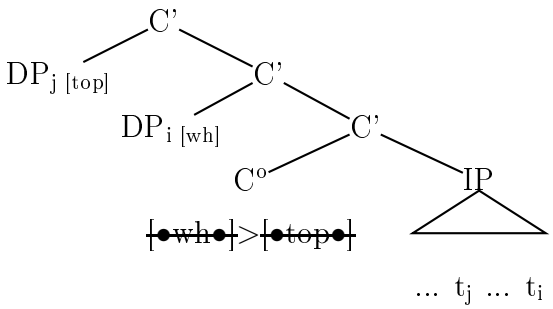
(15)



Finally, the feature $[\bullet\text{top}\bullet]$ is satisfied by internally merging $\text{DP}_{[\text{top}]}$ with C'.

5. These features are mapped as D in the same way as was shown for C° (but see Lopez 2006 for a different account). I leave it open at this point if the relevant features are indeed [top], [foc] etc., or if these are just portmanteau labels for feature combinations, e.g. [±contrastive], [±anaphoric], as proposed by Vallduví (1992); Choi (1996), and recently Lopez (2006).

(16)



The result is a structure containing the C head and two DP specifiers of C, of which the topic DP is located structurally higher than the wh-phrase.

In a second possible instantiation of the C head, C is mapped with a HFF' [•fin / __ V•]>[•foc•] (for the sake of concreteness, I will assume that V-to-C movement is triggered by the feature [•fin / __ V•], which attracts a finite element in the context of a categorial V feature). At a point of the derivation C is merged, and acts as a probe. The highest unsatisfied feature in the HFF' of C is [•fin / __ V•]:

(17) $[_{C'}\ \ [_{C^o\ [\bullet fin\ /\ \_\_\ V\bullet]>[\bullet foc\bullet]}\ ]\ [_{IP}\ \ldots\ V_{[fin]}\ \ldots\ DP_{[foc]}\ \ldots]]$

The active feature [•fin / __ V•] is satisfied by merging $V_{[fin]}$ with C. Now the active feature is [•foc•]. It is dealt with by moving $DP_{[foc]}$ to the edge of C:

(18) $[_{C'}\ [_{C^o}\ V_{i\ [fin]}\ [_{C^o\ \sout{[\bullet fin\ /\ \_\_\ V\bullet]}>[\bullet foc\bullet]}\ ]]\quad [_{IP}\ \ldots\ t_i\ \ldots\ DP_{[foc]}\ \ldots]]$

(19) $[_{C'}\ DP_{j\ [foc]}\ [_{C'}\ [_{C^o}\ V_{i\ [fin]}\ [_{C^o\ \sout{[\bullet fin\ /\ \_\_\ V\bullet]>[\bullet foc\bullet]}}\ ]]\quad [_{IP}\ \ldots\ t_i\ \ldots\ t_j\ \ldots]]]$

The ordered merge operations yield a construction typical of V2 languages with a finite verb in C° and a focused DP as the specifier of C.

One more crucial point has to be examined. All the features considered so far are Attract features. The question is now, how do the head features of C (finiteness, sentence type etc.) fit into this system? In the present approach head features are treated in the same way as Attract features in that they are assumed to be part of the same hierarchy HFF (HFF').

The analysis presented in this section shows a number of differences to cartographic models of clausal architecture. Firstly, functional material is radically reduced. The C domain thus does not contain a cascade of functional projections TopP, FocP, FrameP etc., but exactly the minimal structure needed to express dislocations to the left periphery, which is a possible implementation of Rizzi's (1997) unexplored idea that

> it is reasonable to assume that the topic-focus system is present in a structure only if 'needed', i.e. when a constituent bears topic or focus features to be sanctioned by a Spec-head criterion. If the topic-focus

> field is activated, it will inevitably be 'sandwiched' in between force and finiteness [...]. (Rizzi 1997:288)

Secondly, the number of phase heads above IP is minimised to one phase head C°. Movement to the left periphery is therefore always movement to the phase edge, and the analysis is conform with the null hypothesis that the number of postulated phases is restricted to the core functional categories of the clausal skeleton. Finally, the analysis meets the generalisation that the sentence type is determined by the category which is selected by a higher verb. In what follows I will show that the new approach also makes correct empirical predictions without further assumptions.

4 Differences Between the Two Analyses: Data Coverage and Empirical Predictions

4.1 Predicted but Non-occurring Structures

In a split CP it is potentially possible that the verb raises to a functional head higher than Fin°, which allows the prediction that there are sequences of the type [V α] in which V and α are both C domain elements. This, however, does not seem to be borne out empirically: cross-linguistically, left-peripheral phrases are never found to occur in a lower position than a verb in the C domain.[6] The striking absence of such a construction hints at an exclusion conditioned by the syntactic structure itself, and not just by a constraint. This finding however follows straightforwardly from a CP analysis, in which sequences of the type $[_{CP}\ [_{C}\ V]\ \alpha\ [_{IP}\ ]]$ (with α being a C element) are entirely excluded, as there is simply no head position above C° within the C domain that V could fill (provided that X°-to-Spec movement is prohibited, contrary e.g. to Fanselow 2002).

For example, consider VP topicalisation in German (Brandt et al. 1992; Frey 2005, 2006). As the examples in (20) show, the topicalised VP can be placed above the finite verb, but not below it:

(20) a. $[_{CP}\ [_{VP}$ sie zu besuchen$]_i$ $[_{C'}\ [_{C°}$ hat$]$ $[_{IP}$ keiner geglaubt $[_{CP}$ dass
her to visit has no one believed that
er sich t_i leisten kann$]]]]$
he REFL afford can
'No one believed that he could afford visiting her'

6. Tuller (1992) assumes that a number of Chadic languages display a left-peripheral focus position below V. See Hartmann and Zimmermann's (2004) argumentation against Tuller's account.

b. * [$_{CP}$ keiner [$_{C^o}$ hat] [$_{?}$ [$_{VP}$ sie zu besuchen]$_i$ [$_{IP}$ geglaubt [$_{CP}$ dass
no one has her to visit believed that
er sich t_i leisten kann]]]]
he REFL afford can

The acceptability judgement for (20b) does not seem to be subject to variation: in a survey I conducted with 50 subjects (of which 35 linguists and 15 non-linguists) in May 2007, (20b) was judged ungrammatical throughout[7]; dialectal differences did not seem to play a role.

A background assumption is that VP-topicalisation targets the C domain (Müller 2004, among others). Under a split-C analysis, the finite verb in (20a) has moved to a head the C domain, and the VP is the specifier of a left-peripheral head (Top, Foc, Fin etc.). The clear-cut ungrammaticality of (20b), on the other hand, cannot be accounted for without additional stipulations: unless specific assumptions are made, the finite verb can move to a higher head in the C domain, and the topicalised VP may still be the specifier of a C head. However, the data follow straightforwardly from a CP analysis: VP topicalisation targets the C domain, but in (20b) there is no left-peripheral position available below the finite verb in C^o for the topicalised VP. It therefore has to be analysed as located in the I domain. Scrambling out of finite clauses however is in general not possible in German (see Grewendorf and Sabel 1999, among others).[8]

A comparable effect can be found in Welsh. In this language there are a number of root affirmative particles that have to be adjacent to the verb. C-Adverb intervention is not possible (Roberts 2004:298):

(21) a. Bore 'ma, fe/ mi glywes i 'r newyddion ar y radio
morning this PRT heard I the news on the radio
'This morning, I heard the news on the radio'

b. * Fe/ mi bore 'ma glywes i 'r newyddion ar y radio
PRT morning this heard I the news on the radio

Fe or *mi* introduce declarative finite clauses and are therefore associated with

7. One of the participating linguists put it aptly: "ungrammatical, in fact so ungrammatical that reading it makes your toes curl".

8. Data like (i), involving a complementiser preceding a topicalised VP, seem to contradict the CP analysis. They will be accounted for in section 5.

(i) Weil sie zu besuchen [$_{IP}$ keiner glaubte dass er sich leisten kann]
because her to visit no one believed that he REFL afford can
'Because no one believed that he could afford visiting her'

both Force and Fin. With C-adverbs obligatorily preceding them, *fe/ mi* are located in Fin^{o} (cf. Roberts 2004:300f.). The sentence type specification percolates or is copied to Force^{o}, but cannot be pronounced there, and is therefore pronounced in Fin^{o}, so that there is no left-peripheral position available between the particle and the verb in T^{o}. This analysis does work, technically, but it is based on the additional assumption that the feature [decl] is covertly displaced to Force^{o}, crossing the head of the topic phrase that hosts the C adverb. The CP-based alternative is to assume that *fe/ mi* is the conjoint spellout of [force: decl] and [fin: finite], which make up C^{o}. The argument proceeds as in the split-C analysis: C-adverbs cannot intervene between particles in C^{o} and the verb in I^{o} as there is no C position available below C^{o}. The CP analysis, however, predicts the data correctly without additional assumptions.

4.2 Syntax vs. Morphology in the C Domain

There is apparent counterevidence to the approach presented here: in quite a number of languages (Hausa, Tsez, Gun, Welsh, Yom, Gur etc.) a functional head to the right of an uncontroversial C element seems to be overtly visible. For example, in Gun-Gbe, arguments of main or subordinate clauses are interpreted as contrastively focused if they appear clause-initially and are marked by *wɛ̀* (Aboh 1998:10ff.):

(22) a. (ùn lìn dó) Sɛ́ná xìá wémà lɔ́
(1SG think.PERF that) Sena read.PERF book DET
'(I think that) Sena read the book'

b. (ùn lìn dó) Sɛ́ná wɛ̀ xìá wémà lɔ́
(1SG think.PERF that) Sena FOC read.PERF book DET
'(I think that) SENA read the book'

c. (ùn lìn dó) wémà lɔ́ wɛ̀ Sɛ́ná xìá
(1SG think.PERF that) book DET FOC Sena read.PERF
'(I think that) Sena read THE BOOK'

The focus marker cannot be realised in isolation, and cannot be omitted:

(23) a. * wɛ̀ Sɛ́ná xìá wémà lɔ́
FOC Sena read.PERF book DET

b. * wémà lɔ́ Sɛ́nà xìá
book DET Sena read.PERF

In Aboh (1998:18), *wɛ̀* is analysed as the overt realisation of the left-peripheral head Foc^{o}. However, in this section I provide arguments for the view that

overt topic and focus markers are not C heads, but morphological markers on the displaced constituent.

Different empirical predictions are made depending on whether markers in the C domain are analysed as morphological or syntactic material. First, a morphological analysis predicts that if, in a language with both fronting and in situ focus strategies, the fronted focus can be overtly marked, then the focus in situ can be overtly marked, too. This prediction is borne out, as data from Hausa show:

(24) a. a̅' à faraɗ̃ motà̀ (cē) mukà *sàyā* bà̀ baƙā ba
no white.of car (FOC.F) 1PL.REL.PERF buy NEG black NEG
'No, it was a WHITE CAR we bought, not a black one'

(Hausa, Green and Jaggar 2003)

b. a̅' à nā *aikà̀* dà littāfîn ne bà̀ takàɗ̃dâɗ̃ ba
no 1SG.PERF send with book.DET FOC.M NEG paper.DET NEG
'No, I sent THE BOOK, not the paper'

(Hausa, Jaggar 2001)

An analysis of these focus markers as syntactic heads, on the other hand, entails either stipulating an additional focus phrase within the VP, or postulating two different strategies of focus marking. Both options are problematic: the former alternative multiplies the functional inventory in such a way that every projection that is there in the C domain is free to occur in the V domain, too. This assumption, taken through to its logical conclusion, undermines the idea of universal hierarchies of projections, as it allows for hierarchical relations in the syntax that are contrary to those set by the hierarchy. The latter option makes it necessary to motivate which of the two strategies, DP morphology or overt Foc^{o} heads, is at work in each single focus construction of a given language. This, however, is an unsatisfactory result, as ideally these constructions fall under a uniform analysis.

A prediction made under the syntactic head approach is that cross-linguistically overt topic or focus markers follow, but never precede focused or topicalised constituents. However, a cross-linguistic survey shows that there are indeed languages in which topic or focus markers precede the displaced element, as in Kikuyu and Pulaar:

(25) a. ne mae abdul a-ra-nyu-ir-ɛ (Kikuyu, Schwarz 2006)
FOC 6.water Abdul SM-T-drink-ASP-PHON
'Abdul drank WATER'

b. ko kosam ɗam Aysata yar-i (Pulaar, Cover 2006)
FOC milk DET Aysata drink-REL.V
'Aysata drank the MILK[9]'

Data like those in (25) can still be explained in a split-C framework by assuming that roll-up movement takes place (as put forth by Aboh 2004). On the other hand, no such assumption must be made if the preceding markers are analysed as affixes.

A straightforward test to decide if a given structure is syntactic or morphological is coordination. If topic or focus markers are heads in a split CP, then it follows that if the displaced element is a coordinated structure, the marker never ever appears at each of the coordinated constituents. This, however, is not borne out, as data from Tsez show:

(26) už-ā yā yedu t'ek-gon yā yedu gaziyat-gon
boy-ERG or this book.ABS-TOP or this newspaper.ABS-TOP
t'et'ersi (Polinsky and Potsdam 2001; Zaira Khalilova, p.c.)
read.PST.EVID
'This book or this newspaper, the boy read'

In (26) each of the coordinated topics is marked by *gon*, which rules out the identification of the topic marker with Top°. The only way of integrating this finding into a Split-C analysis is to assume that left-peripheral markers are morphological markers that are phonologically realised as a reflex of the Agree relation with the respective functional head. This analysis is technically feasible; however, note that it comes at a high price: postulating a cascade of heads which are not identifiable as such without ambiguity (as they are phonologically empty) threatens a major empirical argument in favour of cartographic approaches.

To sum up, there is evidence that overt markers in the C domain are not syntactic heads, but affixes. A Split-C analysis can be modeled to account for these findings, but it has to integrate assumptions that weaken the approach. A morphology-based analysis however can be easily implemented in a multiple specifier approach, yielding correct empirical predictions and a strict correlation between data and postulated structure.

9. Pulaar focus constructions are usually translated as cleft sentences, but see Cover's (2006) analysis of these markers as left-peripheral heads.

5 Solutions for Complementisers

So far, the approach does not capture cases of C-markers preceding left-peripheral material, as the Gascon and Icelandic data in (27) show:

(27) a. Cresi (que) los esperits que s'apasimèn (Gascon, Lahne 2005)
think.1SG (that) the minds that REFL-calmed
'I think that people's emotions settled down'

b. að Maríu hefur Helgi aldrei kysst (Icelandic, cf. Vikner 1995:68)
that Maria.ACC has Helgi never kissed
'... that Helgi has never kissed Maria'

(27a) is an example of Clitic Left Dislocation with the C-marker *que* preceding the left-peripheral topic *los esperits* (Lahne 2005). (27b) exemplifies the well-known embedded V2 construction occurring in a number of Scandinavian varieties, which is generally assumed to involve V-to-C movement (see Chomsky 1986; Platzack 1986; Taraldsen 1986, and much subsequent research). A split-C analysis can easily account for these data by assuming that V occupies a lower C position (e.g. Fin°), and the complementiser spells out a higher C head (e.g. Force°). The data however represent a challenge for analyses involving a single CP as there is no higher position in the embedded clause that the complementiser could possibly fill. Previous approaches have solved this issue by assuming that the complementiser or subordination marker is (in some way or the other) the leftmost element of the CP (Sag and Pollard 1994; Pesetsky 1998; Hudson 2002; Anderson 2005; Vincent 2006):

(28) **Left Edge(CP) Constraint** (Pesetsky 1998)
The first pronounced word in CP is the complementizer that heads it.

The solution I would like to propose basically follows these approaches, but offers an explicit, post-syntactic solution. I assume that Late Insertion is at work, and that features can be added between syntax and morphology. In the case of CP marking, this is done by the operation *Enrichment*.

(29) **Distributed Morphology** (Halle and Marantz 1993, 1994; Harley and Noyer 1999 etc.)
In a post-C_{HL} module MORPHOLOGY, a mechanism correlates the feature bundles delivered by C_{HL} with phonetic matrices.

(30) **Enrichment** (Müller 2006:7f.)
Enrichment is an operation that adds features between syntax and morphology (before vocabulary insertion). Enrichment is doubling: it can only insert features into a given structure that are already present.

To formalise and implement (28) I assume that post-syntactic operations are sensitive to edges of categories. *Left edge* is defined as follows:

(31) **Left Edge** (∂)[10]
An element μ is at the left edge (∂) of α iff.
(i) μ is in the edge domain[11] of α;
(ii) there is no ν such that ν is dominated by a segment of α and ν c-commands μ.
If μ is not a minimal projection, then $\partial\mu = \partial\alpha$.

(31) has the effect that if there is an element μ that meets (31i) and (31ii), and is a maximal projection, then μ is at $\partial\alpha$, but also the highest specifier of μ is at $\partial\alpha$, and, finally, the leftmost head that is contained in μ is at $\partial\alpha$. For example, let v have two specifiers. Both the higher and the lower specifier are in the edge domain of v. The highest specifier to the left is at ∂v. And: the leftmost element of the highest left specifier is at ∂v.

The post-syntactic operation Enrichment operates at the left edge of the CP. It has the effect that those features of HFF' of a given head X that are not already deleted in the syntax are post-syntactically copied to the left edge of X. The rule is formalised in (32):

(32) **Mark Left Edge (XP)**
$[_{\text{XP}}\ [_{\alpha}\ ]\ [\text{X}_{[\text{HFF'}]}]\ ] \rightarrow [_{\text{XP}}\ [_{\alpha}\ [_{\text{HFF'}}]\ [_{\alpha}\ ]]\ [\text{X}_{[\text{HFF'}]}]\ ]\ /\_\_\ \alpha = \partial\text{XP}$

If X=C, then (32) unconditionally copies and left-adjoins the head features of C to the leftmost element of the CP, so that at vocabulary insertion HFF' is available both at the left and the right edge of the CP. Mark Left Edge (XP), however, does not apply when C has no specifier, as HFF' of C is already at the left edge in this case. The morphological realisation of C features works as follows: at vocabulary insertion both instances of HFF' are paired with phonological representations of matching vocabulary items. For some specifications of HFF' there are two markers available, one phonologically non-empty marker and one zero marker, which have identical morphosyntactic feature specifications. Vocabulary insertion is context-sensitive[12] in that it detects the two identical specifications; at the same time it is subject to optimisation in such

10. Note that the edge sign is not a formal feature that is inserted, but a symbol marking the left edge in the formal representation.
11. For the sake of terminological clarity, I use the term *edge domain*. It is a synonym for *edge* as defined by Chomsky (2001:13): the edge domain of a category X is the left-peripheral minimal residue outside of X^{o}. This includes specifiers of X and elements adjoined to XP.
12. For independent motivation of contextual allomorphy see Carstairs (1987); Bobaljik (2000); Lahne (2006), among others.

a way that the choice and distribution of the vocabulary items is regulated by a language-specific ranking of violable constraints.

A clarification is in order before I proceed. Note that in this approach, optimisation is not the core of the grammar, but a mechanism controlling extremely local operations, in this case the phonological realisation of terminal nodes. In other words, what takes place here is some kind of low-level optimisation, which is more in the spirit of Pesetsky (1998).

The input is the derivation as it is after the post-syntactic operations have taken place. The realisation of C markers is determined by the interaction of three constraints:

(33) a. NoRed(undancy)
Do not mark a category more than once.[13]
b. Mark∂
A category must be marked at its left edge.
c. FillHead
Head positions are marked.

'To mark a category X' is defined as 'insert a phonologically non-empty marker at X', where the marker is a phonological representation either of X features or of features of an element that was moved to X in the syntax. With regard to the category C, NoRed prevents that C is marked by more than one element. NoRed is a non-gradient constraint: multiple violations within a candidate do not add violation marks. Mark∂ is an alignment constraint; it applies independently of head marking. FillHead is the requirement of adding at least one phonologically non-empty vocabulary item to the feature bundle of heads.

In Gascon the lower C-marker is pronounced obligatorily, whereas the higher C-marker is optional, as shown in example (34). The rules of exponence for the specification [+decl] are given in (35).

(34) a. Cresi [$_{CP}$ (que) los esperits que [$_{IP}$ s'apasimèn]]
think.1SG (that) the minds that REFL-calmed
'I think that people's emotions settled down'

b. ?? Cresi [$_{CP}$ (que) los esperits [$_{IP}$ s'apasimèn]] (Lahne 2005)
think.1SG (that) the minds REFL-calmed

13. NoRed is related to S-Ident$_{const,FC}$ (Ortmann and Popescu 2000), *XX (Grimshaw 1997), to the Obligatory Contour Principle (McCarthy 1986, among others), and, finally to the Doubling Constraint (Ross 1972). It however differs from these constraints in that it applies to non-adjacent elements.

(35) /que/ ↔ [+decl]
/ / ↔ [+decl]

MARK∂ and NO-RED are locally conjunctively tied ("crucially non-ranked", Prince and Smolensky 2004) in Gascon, and FILL-HEAD is the highest-ranked constraint. The input is as shown in (37): [+decl] >[–root] is contained in the feature hierarchy of C. The features are copied and left-adjoined to the dislocated DP *los esperits*. There are four candidates: (a) with C° phonologically marked and a zero vocabulary item at the left edge, (b) without marking, (c) with double marking, and (d) with marking only at the left edge. Candidates (b) and (d) violate the highest-ranked constraint FILLHEAD. Candidates (a) and (c), each violating one of the lowest-ranked constraints once, display the best constraint profile and thus emerge as optimal candidates.

(36) Ranking (Gascon): FILL-HEAD ≫ MARK∂ ∘ NO-RED

(37) Input (Gascon):[14]
[... [CP [DP [+decl]>[–root] [DP los esperits]] [C' [C°[+decl]>[–root]] [IP ...]]]]

Cresi ...	FILLHEAD	MARK∂ ∘ NORED
☞ (a) los esperits que s'apasimèn		*
(b) los esperits s'apasimèn	*!	*
☞ (c) que los esperits que s'apasimèn		*
(d) que los esperits s'apasimèn	*!	

Now consider Icelandic V2 embedded clauses, where the verb is raised to C and the complementiser obligatorily occurs to the left of the topicalised constituent:

(38) Vi ved *(að) Maríu hefur Helgi aldrei kysst
we know *(that) Maria.ACC has Helgi never kissed
'We know that Helgi has never kissed Maria'

In Icelandic FILLHEAD and MARK∂ both outrank NORED, but are locally tied. (40) shows the two competing markers, *að* and a zero marker, both associated with the feature [–root]. With V-to-C movement being obligatory for independent reasons in embedded declarative clauses, the only possible input in declarative contexts is one with verbal features present in C° at vocabulary insertion, as given in (41).

(39) Ranking (Icelandic): FILL-HEAD ∘ MARK∂ ≫ NO-RED

14. A remark on notation: in what follows, feature bundles for which there are no competing markers (e.g., V, DPs) are given in their phonological representation for convenience.

(40) /að/ ↔ [–root]
/ / ↔ [–root]

(41) Input$_{+\text{decl}}$: (Icelandic):
[... [$_{\text{CP}}$ [$_{\text{DP [+decl]>[–root]}}$ [$_{\text{DP}}$ Maríu]] [$_{\text{C'}}$ [$_{\text{C}^{\text{o}}\text{[+decl]>[–root]}}$ hefur] [$_{\text{IP}}$ ...]]]]

Vi ved ...	MARK∂ ∘ FILLHEAD	NORED
☞ (a) að Maríu [$_{\text{C}^{\text{o}}}$ hefur] H. aldrei kysst		*
(b) Maríu [$_{\text{C}^{\text{o}}}$ hefur] H. aldrei kysst	*!	

The verb in C$^{\text{o}}$ is sufficient for fulfilling FILLHEAD. Candidate (a) with double marking wins over candidate (b), in which a zero marker is inserted at the left edge, due to (b) violating high-ranked MARK∂.

An interesting pattern shows up in embedded questions: in the context of embedded C$_{[+\text{wh}]}$, verb movement to C is optional when the marker *að* is absent, and obligatory when *að* is present (Wiklund et al. 2007:15):

(42) a. Hann spurði hvort (*að) hún alltaf hafi sungið í sturtunni
he asked whether (*that) she always had sung in shower.DET
'He asked whether she always had sung in the shower'

b. Hann spurði hvort (að) hún hafi alltaf sungið í sturtunni
he asked whether that she had always sung in shower.DET

The analysis I would like to propose is based on the idea that it is not the verb movement that is controlled by the presence or absence of the complementiser, but rather the other way around: the phonological realisation of the marker *að* is dependent on V-to-C movement.

(42a) and (42b) are results of two different derivations – (42b) involves V-to-C raising, whereas in (42a) the finite verb remains in the V-domain. The competition does therefore not take place between (42a) and (42b), but between the respective variants with vs. without the marker *að*. The marker specification for *hvort* is given in (43):

(43) /hvort/ ↔ [–decl +wh] / __ [–root]

Hvort is specified for a context feature [–root] and thus does not use up this feature at vocabulary insertion. Consequently, in a minimalist approach to DM (Trommer 2003), a second marker specified for [–root] can be inserted into a matching feature bundle. In input$_{+\text{wh}}$ 1, C has no specifier. Its features are therefore already at the left edge of C, so that Mark Left Edge (XP) does not apply in the first place.

(44) Input$_{+wh}$ 1: (Icelandic):
[... [$_{CP}$ [$_{C^o}$[–decl]>[+wh]>[–root]] [$_{IP}$ [$_{DP}$ hún] [$_{I^o}$] [$_{I'}$ [$_{vP}$ alltaf hafi sungið]]]]]

Hann spurði ...	MARK∂ ∘ FILLHEAD	NORED
☞ (a) [$_{C^o}$ hvort] hún alltaf hafi sungið		
(b) [$_{C^o}$ hvort að] hún alltaf hafi sungið		*!

Both candidates meet MARK∂ and FILLHEAD; however, in candidate (b) two phonologically non-empty markers are inserted at C^o, which causes a fatal violation of NORED. In input$_{+wh}$ 2 the verb has moved to C, and Mark Left Edge (XP) has applied as C has a specifier (*hún*).

(45) Input$_{+wh}$ 2: (Icelandic):
[... [$_{CP}$ [$_{DP}$ [–decl]>[+wh]>[–root] [$_{DP}$ hún]] [$_{C'}$ [$_{C^o}$[–decl]>[+wh]>[–root] hafi] [$_{IP}$ [$_{vP}$ alltaf sungið]]]]]

Hann spurði ...	MARK∂ ∘ FILLHEAD	NORED
☞ (a) hvort að hún [$_{C^o}$ hafi] alltaf sungið		*
☞ (b) hvort hún [$_{C^o}$ hafi] alltaf sungið		*

In tableau (45) none of the candidates violates the two highest-ranked constraints. Candidate (b) violates NORED once (recall that a category X can be marked both by pronouncing an X feature and by pronouncing an element that was moved to X in the syntax). Candidate (a), too, violates NORED only once: with NORED being a non-gradient constraint, the triple marking of C (*hvort, að, hafi*) counts as one violation.

This now raises the question why a sequence like 'hvort (að) hún [$_{C^o}$ hvort (að) hafi]' is ungrammatical, although it has the same constraint profile as the two candidates in tableau (45) and is allowed under the assumption of multiple insertion. There are at least two possible answers: the first solution is to assume that multiple insertion into one head α results in affixing or cliticisation, and neither is possible between verb and complementiser in Icelandic; the second solution is that HFF' contains at least one more feature which is consumed by the verb at vocabulary insertion, so that the remaining features in C^o can only be correlated with a zero elsewhere marker.

Optimality Theory predicts that there are languages with inverse constraint ranking, i.e., in which NORED is higher-ranked than the local tie MARK∂ ∘ FILLHEAD. One such language is German. In this language the marker *dass* is obligatory in verb-final contexts, but unacceptable in V2 embedded clauses:

(46) a. Ich glaube, (*dass) er hat gelacht
I think that he has laughed
b. Ich glaube, *(dass) er gelacht hat
I think that he laughed has

(46a) and (46b) are results of two different derivations and are therefore not competiting – (46a) involves V-to-C raising, whereas in (46b) the finite verb remains in the I-domain. The ranking for German and the insertion rule for the specification [–root +decl] are given in (47) and (48):

(47) Ranking (German): NoRed ≫ Mark∂ ∘ FillHead

(48) /dass/ ↔ [–root +decl]
/ / ↔ [–root +decl]

In input 1 HFF' of C is copied and left-adjoined to the displaced DP *er*. Candidate (b) wins, though violating Mark∂, with candidate (a) violating higher-ranked NoRed.

(49) Input 1 (German):
[... [$_{CP}$ [$_{DP\ [+decl]>[-root]}$ [$_{DP}$ er]] [$_{C'}$ [$_{C^o[+decl]>[-root]}$ hat] [$_{IP}$ ...]]]]

Ich glaube, ...	NoRed	Mark∂ ∘ FillHead
(a) [$_{CP}$ [$_{DP}$ dass [$_{DP}$ er]] [$_{C^o}$ hat] ...]	*!	
☞ (b) [$_{CP}$ ø [$_{DP}$ er] [$_{C^o}$ hat] ...]		*

In input 2, HFF' of C is not copied, as C^o itself is already at the left edge of the CP. Candidate (b) violates both Mark∂ and FillHead, and is harmonically bounded by candidate (a).

(50) Input 2 (German):
[... [$_{CP}$ [$_{C^o[+decl]>[-root]}$] [$_{IP}$ er gelacht hat]]]

Ich glaube, ...	NoRed	Mark∂ ∘ FillHead
☞ (a) [$_{CP}$ [$_{C^o}$ dass] er gelacht hat]		
(b) [$_{CP}$ [$_{C^o}$ ø] er gelacht hat]		*! *

This analysis also extends to the case of German VP-topicalisation mentioned in footnote 8, repeated here as (51):

(51) Weil sie zu besuchen [$_{IP}$ keiner glaubte dass er sich leisten kann]
because her to visit no one believed that he REFL afford can
'Because no one believed that he could afford visiting her'

Here the verb is not moved to C^o, and Mark Left Edge applies, as C has a VP specifier. Optimisation over vocabulary insertion yields a phonologically non-empty marker at ∂CP, as the insertion of the zero marker fatally violates Mark∂ (though both candidates violate FillHead).

6 Outlook

In this paper I discussed a number of difficulties emerging when a strictly cartographic approach is implemented as a minimalist analysis. I suggested an alternative analysis involving a singular CP with C^{o} being made up of a feature hierarchy. In this approach the features of C are dealt with hierarchically, yielding ordered merge of multiple specifiers of C. In addition, I put forth arguments for the view that seemingly overt left-peripheral heads are in fact morphological markers on the displaced constituent. Furthermore, I proposed an Late Insertion analysis of clause-initial C-markers as being subject to optimisation at vocabulary insertion.

This approach is entirely compatible with analyses resting upon a flexible syntactic architecture, such as the ones put forth by Haider (1993), in which C and I are conflated in German, and Hegarty (2005), according to which features are not associated with fixed categories, and variation is due to differences in feature ranking and divergent constraints on features.

The analysis presented here has an interesting theoretical implication, which is also pointed out by Richards (2006:12): if the argumentation is on the right track, then it maximally constrains the extent of possible decomposition not only for the C domain, but for other core categories like IP, vP/VP, DP/NP, too.

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