1. Introduction

It became clear in the beginning of the nineties, that syntax was at the beginning of a new cycle of theoretical progress\textsuperscript{1}. It had become possible, and necessary, given the analytical options available to the linguist and hence the language learner, to ask general questions about the structure of the theory and theoretical parsimony. In the immediately pre-Minimalist area, there were a number of ideas about theoretical parsimony, which got overshadowed by the somewhat different answers to the same basic question of theoretical parsimony pursued by Chomsky in the Minimalist Program (Chomsky, 1993), and further developed in Bare phrase structure and Chapter 4 (Chomsky, 1995). Dominique Sportiche (1992, 1995a, 1995), for example, proposed that all syntactic relations reduced to two licensing relations: the Spec head licensing relation and the head head licensing relation, which were mediated by movement (overt or covert). In Licensing Heads (Koopman, 1994), I pursued the idea that all complement relations reduce to the head movement configuration, and that the binary branching nature of phrase structure itself falls out from the properties of the way in which head movement proceeds. Kayne (1994), from his side, pursued the extremely interesting idea that the relation between hierarchical and linear order is rigidly fixed with linear order corresponding to asymmetric c-command relations (the LCA), and tackled the problem of how to derive the properties of X-bar theory itself.

It became possible to ask these theoretical questions because of a better understanding of the empirical phenomena in many human languages. This better understanding in turn was made possible by developments in the mid eighties: the VP internal subject hypothesis (Koopman and

\textsuperscript{1}Parts of this paper have been presented at DIGS IV in Montreal (November, 1995), (Antisymmetry and the doubly filled Comp filter) at USC (1995) (Antisymmetry and the generalized doubly filled Comp filter) and at UCLA (1996). I thank the audiences for lively discussions, and Edward Garret and Felicia Lee for comments on a previous version of this article.

However, our understanding of empirical phenomena has continued to grow and as a result has changed since the early nineties. This is due on the one hand to many careful analyses, independently of Kayne 1994; on the other hand it results from new insights deriving from analyses inspired by Kayne 1994. From these works, it is clear that languages appear to make extensive use of pied piping of all kinds of constituents. This indicates that the picture that we had in the beginning of the nineties, which involves articulated structures and quite a lot of movement, was simply incomplete and even more general than previously thought. There is actually more overt movement than previously thought, with pied-piping being the norm rather than the exception: it looks as if everything needs to move (at least once). The question is of course why this should be so. In this paper, I will be concerned with the type of configurations that one seems to find in languages, taking into account the existence of heavy pied-piping. I will focus on the distribution of overt elements over spec and head positions, propose a revision of Kayne’s LCA which allows us to derive the doubly filled Comp filter, and develop a proposal which forces massive movement. The proposal that I will develop is much in the spirit of work by Sportiche 1995, Koopman 1994 and Kayne 1994 and Kayne’s recent work (UCLA class lectures, January 1996).

2. The problem of Pied-piping

Languages appear to make extensive use of pied-piping of all kinds of constituents, other than DP and PP. This can be shown for languages that would typologically be classified as head initial languages. The arguments for pied-piping are therefore independent of the type of movement that must be assumed if Kayne 1994 is correct in assuming that all languages are underlyingly head
initial. (Kayne shows that the standard view that languages have symmetrical structures (i.e. OV is symmetric with VO) does not yield the expected patterns in crosslinguistic variation).

2.1 Pied-piping of constituents within the DP

The existence of pied-piping can perhaps be best illustrated within DPs. This kind of pied-piping is robustly found in languages with overt agreement patterns (cf. Bantu languages), and in fact also in English and French (Kayne 1994) and Dutch (Bennis and Den Dikken 1995, and Hoekstra 1995 for some extremely strong empirical arguments) to name but a few.

I will illustrate this property for Bantu languages. In Bantu languages, the “genitive” DP agrees in class and number features with the head N. A so-called “associative” marker *a* carries the agreement and precedes the genitive DP\(^2\). This pattern of agreement can be reduced to the familiar Spec head agreement relation if it is assumed that a phrasal constituent containing the head N pied-pipes to the left of the associative marker, triggering the usual Spec head agreement. (cf. Nkemnji, 1995, Moritz, 1993):

\[
\begin{align*}
\text{Agr} \quad \Rightarrow \\
(1) \quad [ [XP \ldots \text{N}]_i \text{ Agr-}a \text{ [DP [XP \ldots ]}_i]
\end{align*}
\]

Preposing of a phrasal constituent containing the head N, triggers agreement on the associative head as a regular Spec head relation, and derives the correct word order patterns.

The derivation in (1) is by no means an isolated case where we need to assume phrasal movement of some XP constituent to the left. Many other cases are found (Koopman 1993, 1994, Androutsopoulos 1994). And of course, Kayne 1994 proposes similar derivations for a picture of John’s, and a host of other structures in English and Romance languages:

\[
(2) \quad [ [\text{a picture}] [of [John’s \text{ e }]]]
\]

\(^2\)The parallelism with Romance *de* is actually even greater, in the sense that the associative marker also precede postnominal adjectives. This recalls Kayne’s (1994) analysis of [quelqu’un [ de [célèbre [ ]]]]
Pied-piping analyses are successfully applied to certain Dutch DPs (Bennis and den Dikken 1995) and finds strong empirical support (Hoekstra 1995)

Pied-piping is not restricted to DP internal structure, but holds quite generally for all projections. I briefly discuss two more examples.

2.2 Pied-piping of IP.

Sportiche (1995) argues that French intonational questions like the following:

(3) tu va venir demain?

involve a derivation where IP pied-pipes to the Spec of the Q morpheme, which seems to occur clause finally as sentence final rising intonation:

(4) [ IP tu va venir demain [ Q [ e] ]

Although this analysis might seem less obviously correct, - after all the Q head is only intonationally present, and thus not an overt terminal element -, Sportiche gives some extremely interesting empirical support for this analysis, which concerns the licensing of negative polarity items. While head initial yes/no questions in French license negative polarity items (as do negative environments), but intonational yes no questions do not (as do statements):

(5) a. A-t-il-vu qui que ce soit?
   Has- he-seen anyone

   b. *il a vu qui que ce soit?
   He has seen anyone
This quite surprising fact receives an immediate explanation if the structure is as in (4): clausal pied-piping removes the negative polarity item from the c-command domain of the Q head. Intonational questions therefore cannot contain a negative polarity item.

### 2.3 Pied-piping of the complement of Neg.

Nkemnji (1995) argues for phrasal pied-piping of the complement of NegP to Spec, NegP in Nweh, a Grassfield Bantu language spoken in Cameroon. Nweh looks like a regular head initial language. Clausal negation is expressed in two places: by a marker preceding the verb te and by a clause final element (bo).

(6) Njikem a ke? te pfEt akendON bO
    N Agr P-1 Neg eat plantains Neg

At first sight, it looks as if te equals French ne and bO equals French pas. It turns out however that the initial element te has the same properties as pas, while the final element bO has the properties of a head and is thus comparable to ne (bO alternates with the verb in certain configurations, as in the example below).

(7) Njikem a ke? te akendON pfEt
    N Agr P-1 Neg banana eat

Nkemnji convincingly argues for an analysis which treats bO as the head of NegP, with the complement marked by te moving to Spec, NegP:

(8) [NegP [XP te.. [bO [e]]]]
    (pas) (ne)

What is interesting here is that the pied-piped complement is extremely “heavy”, containing clausal complements, and adjuncts.³

³Because-clauses form the only exception, see Nkemnji (1995) for an interesting discussion.
(9)  a.  n kE?  [te ju? te njikem PW fia nkap ambo Atem Wjuu] [bO [ [ e ]]

1SA P1 te hear that Njikem Agr P2 give money to Atem yesterday bO

‘I did not hear that Njikem gave money to Atem yesterday’

b.  njikem a kw [te fia nkap ambo Atem Wjuu ] [bO [ [ e ]]

Njikem 3Agr P2 te money to Atem yesterday bO

‘Njiekem did not give money to Atem yesterday’

This is expected, given the fact that it is some high constituent that moves.

2.4 Two configurations

In conclusion, then, languages make use of overt pied-piping of constituents. Some of these constituents are surprisingly big and clause-like. Besides pied-piping (movement of some XP to some Spec position), a different configuration is well-attested: languages make use of head movement (movement of some head to another head position). If I were to pursue the discussion for each category (some of which I will be doing below), and present a complete “inventory” of what one finds and does not find in human languages, I believe that the following two configurations would emerge:

(10)  [ [γX] [ ... [X] ] Head movement to some head position Y, or
       [ [XP [ Y [ [XP ] Movement of some XP to Spec, YP

I will operate on the assumption that (10) is a true generalization. Another way of describing this pattern is that languages either lexicalize the head of some projection, or the Spec of some projection: the question arises why this is so.

4In Koopman (1994), I suggest that it is precisely these two configurations that are found, because they bring the head N in the domain of a c-commanding head, which would allow the head N to subsequently incorporate and satisfy the lexical properties of some predicate.
The overall picture then is the following: besides the familiar pattern in which languages raise a head to some high position, languages also make use of phrasal pied-piping by which some constituent ends up in a very high Spec position, possibly pied-piping entire clauses or IP-like constituents. This raises the question how wide-spread pied-piping really is. I suspect that rather than being marginal or isolated, pied-piping of predicates and clausal constituents occurs extremely frequently in human languages. This raises a number of interesting questions.

(11) - If pied-piping is so heavily used, why did it take us (linguists) so long to discover it?
- Why precisely do we get the two patterns in (10)?
- What motivates pied-piping?

As for the last question, Chomsky’s feature driven theory of movement does not seem to yield much insight into the problem of the motivation of pied-piping. This is to be expected, given that the standard assumption about what kinds of movements one finds and doesn’t find simply does not include the type of pied-piping of heavy constituents that natural languages instantiate. A different kind of answer is therefore called for. I will try to provide some insights into these questions by examining the Spec head relation, in particular by examining the distribution of overt and covert terminal elements over the Spec and head positions. Before doing so, I briefly spell out my background assumptions:

- Syntactic structures are binary branching (Kayne 1984),

(12) \[
\begin{array}{c}
\text{XP} \\
\text{Spec} \\
\text{X'/XP} \\
\text{X} \\
\text{YP}
\end{array}
\]

- There are no multiple Spec positions
- Adjuncts are accommodated within this structure (as in Sportiche, 1994)
- there is no variation in hierarchical structure between languages.
This implies that there can be no parameters distinguishing languages as having a high negation or a low negation, or as having a high Focus or a Low focus. I take the basic ordering to be given, and will not address the interesting research question how it arises.

Linear order in languages arise from movement operating on the underlying skeleton. Here the assumptions that play a role in my paper are:

- head movement (left adjunction only)
- XP movement (leftward only).
- LCA (The Linear Correspondence Axiom, Kayne (1994), or some version thereof). The LCA is based on idea that the relation between hierarchical structure and linear order is rigidly fixed, with asymmetric c-command mapping into linear precedence.

3. The Spec head relation

Given the existence of extensive pied-piping, and head movement, and large underlying structures, analyses are often underdetermined. As linguists we encounter the problem that too many options seem to be available. (Developments in the nineties can all be seen as reducing these options). We can state the problem from the point of view of the language learner: how does the language learner know where some phonologically overt element is pronounced? He/she knows that there is a hierarchical order of projections, that this structure is quite substantial, with each feature corresponding basically to a projection, and that extensive movement has taken place. The language learner gets much help from Kayne’s (1994) Linear Correspondence Axiom LCA and knows that linear order corresponds to asymmetric c-command relations. I will start with a suggestion that a slightly modified LCA further restricts possible analyses, and thus reduces the space of possible hypotheses entertained by the language learner. This proposal will lead me to a further examination of the type of configurations that are expected to arise.

3.1 The LCA and deriving the doubly filled Comp filter.

In his (1994) book, Kayne encounters the problem of how Spec positions are possible at all under the LCA. This problem can be illustrated in the following structure:
In this structure, $X'/XP$ (the actual label of this node is not important for the present discussion) asymmetrically c-commands $Y$, and therefore $x$ should precede $y$. However, $YP$ also asymmetrically c-commands $X$, which means that $y$ should precede $x$. This configuration can therefore not arise. In order to allow for this structure, Kayne proposes to restrict c-command to categories. This removes $X'/XP$ from the set because it is a segment. This leaves $YP$ asymmetrically c-commanding $X$, and $y$ therefore precedes $x$.

For reasons having to do with the theory of head movement (Koopman, 1994), I wanted to keep segments as c-commanders. I therefore explored a different solution to this problem. Suppose that we let $X'/XP$ participate in c-command. Consider the configuration in (13) again. This configuration says that there can be no terminal elements in the Spec position of a projection, and in the head position. But it has often been proposed that this is correct, and there is even a filter which prohibits precisely this configuration: the doubly filled Comp filter, generalized in Sportiche (1992, 1993) to the doubly filled Voice filter, and generalized to the Spec head configuration in Koopman (1991, 1993). The doubly filled Comp filter itself is as yet unaccounted for. The structure in (13) provides a simple way to derive the doubly filled Comp filter from the LCA, provided we find a way to allow for the configuration. One way to achieve this is to restrict the application of the LCA to overt terminal elements only (see also Chomsky, 1995 chapter 4). I will call this version of the LCA the modified LCA:

(14) Segments participate in c-command\(^5\)

\(^5\)As Kayne (personal communication) points out, allowing $X'/XP$ to be within the set of c-commanders raises a problem with respect to the ordering of the complement and the specifier, because these would be too symmetrical as well. I will not address this point here, but maybe complements are forced to move as well. From recent work it has become clear that many terminal elements are in fact occupying Spec positions: the configuration $[ ... \ [\text{Spec} \ H \ \text{[complement]} \ ]$ with positions containing overt material
Modified LCA: the linear order of overt terminal elements corresponds to asymmetric c-command.

3.2 Spec head configurations.

The modified LCA allows for the configuration in (13) iff one of the terminal elements is covert. Let us examine what the modified LCA has to say about the different Spec head configurations, distributing overt (boldfaced) and covert (italics) elements over Spec and head positions. Within covert categories, we further distinguish between traces (covert categories which are not the head of a chain) and covert heads of chains. This will play a role in section 3.6.

(15)

a.  * \[ \text{XP} \]  b.  \[ \text{XP} \]  
   \text{YP}  \[ \text{X'}/\text{XP} \]  \text{YP}  \[ \text{X'}/\text{XP} \]  
   \text{overt}  \text{X}  \text{overt}  \text{X}  
   \text{overt}  \text{overt}  \text{covert}(trace, or head of chain)  

   c.  \[ \text{XP} \]  d.  \[ \text{XP} \]  
   \text{YP}  \[ \text{X'}/\text{XP} \]  \text{YP}  \[ \text{X'}/\text{XP} \]  
   \text{covert}  \text{X}  \text{covert}  \text{X}  
   \text{(trace, or overt)(trace, or covert)(trace, or head of chain)}  
   \text{(trace, or overt)(trace, or covert)(trace, or head of chain)}  

It follows from the modified LCA that no projections can have terminal elements in Spec and in the head (15a). The doubly filled Comp filter is one particular example of this configuration. According to (15a), however, it should be entirely general and apply to all projections. This is the

boldfaced seems to be omnipresent. Taken to apply derivationally, the LCA would force complements to move to Spec positions, and force further movement of the Spec or the head position. For the highest position in superficially head initial languages, it presumably forces both the head and the Spec of the complement to be silent:

\[ \text{Spec} \quad \text{H} \quad \text{Spec} \quad \text{H} \quad [\quad \text{H} \quad [\text{compl} \quad \text{H} \quad] \quad \]
Double Voice filter of Sportiche (1992) for clitic constructions and Romance negative constructions, and the generalized doubly filled Comp filter, used in Koopman, 1991 and 1993 for the structure of pronouns. Many linguists (including myself, Koopman, 1983, 1993) have taken the doubly filled Comp filter to be some type of economy principle which can be violated in certain cases. If the proposal above is correct, however, this simply cannot be true: the configuration can never occur, because there could be no linear ordering. This raises the question what to do about violations of the doubly filled Comp filter. I will argue for alternative analyses of these violations in section 3.3.

Configurations that are allowed by the LCA are presented in (15b) and (15c). These in fact represent the expected cases: projections can have terminal elements in Spec. This yields so-called Spec marking languages (15b). Projections can have a terminal element in the head position. This yields so-called Head marking languages (15c). Languages can (and presumably must) exhibit any mixture of these two patterns, as long as neither Spec nor head projections end up containing overt material. It is important to point out that the question of whether (15a) is inviolable is in fact logically distinct from the expectation that languages conform to pattern (15b) or (15c). This expectation is still true if the generalized doubly filled Comp filter were an economy principle. (15d) represents the fourth and last possibility. Projections can have a covert Spec and covert head (15d), with further distinctions between types of covertness (is the covert element the head of a chain or is it not). The modified LCA has nothing to say about this configuration, since it does not apply to covert elements. In 3.6, I pursue the idea that this configuration is actually excluded if both the Spec position and the Head position are the head of a chain.

This paper then contains three interrelated, but logical distinct proposals.
1. The LCA applies only to terminal elements, and c-command is not restricted to categories. This proposal derives the doubly filled Comp filter. I briefly examine violations of the doubly filled Comp filter, and argue for a general solution for these cases.
2. Languages are expected to be have overt heads with silent Specs or silent Specs with overt heads. This expectation is still valid independent of the question of whether the doubly filled Comp filter derives from the LCA, or whether it is some economy principle. I turn to cases that fit the configurations well, and show how patterns which have been felt to be problematic so far, in fact represent the norm. I also discuss some cases where the actual surface word orders derive from
leftward movement to Spec and the presence of a head. I argue that two phenomena fall under this heading: head drop and pro drop.

3. Languages disallow projections to be headed by silent covert heads and Specs (15d). In particular, I will propose a principle that requires a projection to be associated with lexical material at some point in the derivation. The idea here is quite simple: projections must be activated to be semantically interpretable. Projection Activation happens by associating overt lexical material to either Spec or head at some point in the derivation. This principle provides the motivation for pied-piping, and derives the two configurations in (10).

3.2.1 Why did it take us so long to discover the extent of pied-piping?

I am now ready to provide an answer to the first question that we raised in (11a):

(11a) If pied-piping is so heavily used, why did it take us (linguists) so long to discover it?

Pied-piping is XP movement to a Spec position; It is quite easy to see if some small DP or PP has moved to some Spec position as in whose mother did you visit, (although it might not be immediately obvious that the head position of that projection is empty (cf. 3.3.3 below) ). The DP can occur in other positions within the clause. This type of pied-piping has of course been part of syntactic theory since the very beginning. Pied-piping of bigger constituents is simply much harder to detect, even if the bigger constituent occurs in different positions (as is for example the case with French yes/no questions). An overtly pied-piped element in Spec position forces the head of that projection to be silent, because it creates the configuration in (15b). The effects of pied-piping are therefore often hard to detect.

3.3 Problematic cases: Doubly filled Comp phenomena.

The doubly filled Comp filter was formulated in Chomsky and Lasnik (1977) to account for the impossibility of both an overt wh-phrase and an overt C, and was instrumental in accounting for the form of relative clauses:

---

6This principle is reminiscent of Cheng’s (1991) clause typing proposal.
It is well known that the doubly filled Comp filter doesn’t seem to hold universally. There are some languages which allow for more than one overt element in the C domain. (Dutch, Quebec French, etc). Even within English the doubly filled Comp filter does not seem to hold of all types of Cs. For example, no doubly filled C filter violation arises in root wh-questions with non-subject wh-phrases and inverted I (who did you see). The crosslinguistic variability has been taken by many to show that the doubly filled Comp filter can be violated. In that respect, it is more like an economy principle (“avoid lexical material”) that languages could choose to disobey. If the doubly filled Comp filter derives from the LCA, as proposed above, this simply cannot be true. The question then arises if we can find alternative analyses for doubly filled Comp filter violations, and how plausible these analyses are. The remainder of this section examines some violations of the doubly filled Comp filter, and sketches analyses for these that are not only compatible with the LCA, but in fact necessary independent of the LCA. I will discuss V-second phenomena in Dutch, doubly and triply filled Comps in Dutch, turn to apparent violations in English, and finally discuss verb movement in tensed clauses in French.

3.3.1 Verb second

Consider the verb second phenomena, illustrated in the examples below:

(17)  

(i) Jan komt morgen (Dutch)  
John comes tomorrow

(ii) Morgen komt Jan  
Tomorrow comes John
‘Tomorrow, John comes’

Two ingredients go into the standard analyses of verb second phenomena. First, some XP constituent pied-pipes to an initial Spec position in root clauses (say, Spec, TopicP). And secondly,
the finite verb moves to the highest head position (say, Top⁰). As we can see in the following structure, this yields a doubly filled Comp effect:

(18) \[
\text{TopP} \quad \text{XP} \quad \left[ \text{Top} \quad \text{Vf} \right] \quad \ldots \quad \left[ \text{DP} \right]
\]

\[
\text{Morgen} \quad \text{komt} \quad \text{Jan}
\]

My proposal makes this analysis unavailable, since the phrasal projection XP and the finite verb cannot be within the same projection. This problem might seem serious enough to simply abandon the proposal that the modified LCA derives the generalized doubly filled Comp effect. Yet, I do not think that this is necessary or even desirable. There is an alternative analysis which is consistent with the LCA: The initial XP is to the left of the preposed V, say in Spec, TopP. Since the Spec is overt, the head of this projection must be empty. The finite verb therefore occupies the head position of a lower projection, which by the LCA must have a silent Spec:

(19) \[
\text{XP} \quad [Y] \quad \text{Spec} \quad [Vf]
\]

\[
\text{Jan} \quad \text{e} \quad \text{e} \quad \text{komt} \ldots
\]

\[
\text{Morgen} \quad \text{komt}
\]

This proposal therefore forces the presence of more (rather than less) structure in the C domain: it forces a split C approach. This might seem ad-hoc. However, quite independently from my proposal, there is mounting evidence that we need to assume a split C approach anyway ((Bhatt and Yoon (1992), Sportiche, 1993, Rizzi, 1995, Nkemnji, 1995, Hallman, 1995). Moreover, my proposal leaves the necessary space to account for the fact that the V-second phenomenon in Germanic languages is not a unified phenomenon, and that there is quite a bit of variation in the initial domain. So, the argument is that it is not only desirable, but also unavoidable to assume more structure. If there is more structure, then one would expect the situation in (19) to arise. In addition, we expect the modified LCA to further restrict possible analyses that can be entertained by the language learner: one therefore expect to find some systematic patterns in the seemingly chaotic patterns of violations of the doubly filled Comp filter that languages seem to exhibit. I turn to this problem now.
3.3.2 Doubly filled Comp in embedded clauses

In embedded wh-questions in Dutch, overt wh-phrases and complementizers may (but do not need to) cooccur:

(20)  a. Ik vraag me af *wie of dat* er morgen komt
     I wonder who if that there tomorrow comes

     b. Ik vraag me af *wie* of er morgen komt
     I wonder who if there tomorrow comes

     c. Ik vraag me af *wie* er morgen komt
     I wonder who there tomorrow comes

     d. Ik vraag me af *wie dat* er morgen komt
     I wonder who that there tomorrow comes

These again cannot be analyzed as occupying the Spec position and the head position of the same C projection. Rather, an analysis is forced which has a separate WH projection, hosting the wh-phrase, a Q projection, hosting the head of (of typically occurs in +Q) and a declarative C projection hosting the head dat:

(21)  [XP [WH [ [Q [C .. (=20a)]
       [wie (cov) (cov) of (cov) dat...

Since I am assuming that languages do not vary structurally, I will assume that the order of projections is universally as in (21).

We must further account for the fact that in all Dutch dialects, these complementizers can be absent. If the language learner encounters an empty C, s/he might assume the C is empty because it occurs in the head position of a projection that host an overt Spec (i.e. the configuration (15a) obtains). The absence of further overt C heads can be accounted for by assuming that the other C heads are traces. This yields the following representations for (20c) and (20b) respectively:
If Dutch makes a distinction between a Wh projection and a Q projection, and if Dutch reflects the underlying hierarchical order of these projections, all languages, including English, should have these projections in this order. If there is more structure in the C domain, the question arises why English does not behave in the same way as Dutch. I turn to these questions in the next section.

### 3.3.3 Doubly filled Comp in English

Let us next turn to English. As pointed out above, the doubly filled Comp seems to hold in standard English embedded Cs, but not in root wh-questions, where a non-subject has undergone wh-movement. The problem of matrix wh-questions immediately disappears given the structure that we have determined for Dutch. In matrix wh-questions, the wh-word occurs in Spec, WhP and the inverted I in Q:

\[
(25) \quad [\text{XP}] [\text{WH}] [\text{Q}] [\text{C} [..] = (20c)]
\]

\[
\text{who} \quad \text{(cov)} \quad \text{did} \quad \text{(cov)} \quad ...
\]

There is no doubly filled Comp filter violation, because the wh-phrase is in Spec of the Wh projection, and the auxiliary is in Q (or in C). What about embedded wh-questions in English? In embedded questions with overt wh-phrases, *that if* and *whether* are silent. I assume that English is like Dutch (21) with the Wh head silent, heading a chain in Q and C.

\[
(26) \quad [\text{XP}] [\text{WH}] [\text{Q}] [\text{C} [..]
\]
Note that the Q head, which must be lexical in English (it is strong and therefore attracts I) also counts as “lexical” in (26), since it is a trace of the raised Q (it is not the head of a chain, and therefore doesn’t fall under (15d)).

There are dialects of English which allow different patterns. Belfast English, for example, seems to exhibit the following paradigm. This paradigm is based on Alison Henry (1995):

(27) a. I wonder which dish that they picked
b. *I wonder which dish whether they picked
c. * I wonder which dish if they picked

This can be analyzed quite straightforwardly. Contrary to standard English, that can remain in C and fail to raise (27a) in Belfast English. Belfast English is like Dutch (20d) in this respect. Belfast English also differs from Dutch however: if cannot remain in Q, but must obligatorily merge with the +WH head. This accounts for the impossible cooccurrence of if and a wh-phrase in (27c). Whether is an element which must be associated with the Wh projection; Whether will not be allowed to surface in this structure, either because it is a wh-phrase in Spec, WhP (and this position is therefore unavailable for whether), or more correctly, I think, because whether occurs in the head position of the Wh projection, (with a silent wh-phrase in Spec which is responsible for the movement characteristics associated to whether (Larson 1985) and the LCA disallows lexical material in both Spec and head positions. (For an argument that whether acts as a head, not as a wh-phrase, see the discussion on inversion in embedded questions below.) Therefore, no English dialects should allow wh-phrases and whether to cooccur. So far, then, the only difference between standard English and Belfast English is that that is allowed to stay in-situ:

(28) XP [ WH [ [ Q [ [ C [ ..
       which X [e]i [ e]i [ that]
There is an additional difference between Belfast English and “standard” English or Dutch, and this concerns the possibility of inversion in embedded wh-questions. The following paradigm holds for Belfast English (Alyson Henry, 1995), who shows that these wh-questions are true embeddings. (inversion is optional, and non-inverted indirect wh-questions are fine as well):

(29)  a. I wonder which dish had they picked
     b. *I wonder whether had they picked the dish
     c. *I wonder if had they picked the dish
     d. She wonders had she picked the dish

Thus overt whether and if always block inversion. But when whether and if are covert, inversion is possible. Overt whether and if block inversion because they occupy the Q head at some stage of the derivation, and the Q morpheme is thus satisfied. It is interesting that whether patterns with if in this respect, and not with wh-phrases. This shows that whether is a portmanteau head which is both +Q and +Wh. Inversion is only possible, if the Q head is truly empty: that is, if the Q morpheme is allowed to be absent from the initial array. When this happens, I to Q movement becomes obligatory.

This brief discussion is intended to make clear that the split C approach is in fact necessary if we simply want to address the problem of apparently filled doubly filled C phenomena and make sense of the crosslinguistic and dialectal variation. It is also clear that the modified LCA severely restricts possible hypotheses that the languages learner can entertain.

It is clear, then, what kinds of solutions are compatible with the revised LCA: we need to assume a more complex structure that provides enough heads and Spec positions. This conclusion is in agreement with Kayne (1994), Sportiche (1993), Koopman (1994) and logically continues work on split I (Pollock, 1986) and many others (Bhatt and Yoon (1992), Rizzi, 1995, Nkemnji, 1995, Hallman, 1995), but seems incompatible with the attempt to reduce the number of head positions, and make use of multiple Spec positions, as in Chomsky’s chapter 4 (Chomsky, 1995).
Chomsky’s proposal encounters the problem that many languages actually instantiate these head positions overtly: this seems to be excellent evidence that these head positions indeed exist. It is also clear that we should avoid postulating more structure, because this allows us to derive the doubly filled Comp filter (but note that if UG says that you cannot have both Spec and head overt, the language learner will be simply forced to do so, even if there would be no other supporting empirical evidence whatsoever). It is quite clear where to look for supporting empirical evidence. For example, the structure of split Cs should provide us with the means to account for the various and quite complex variations that one find between languages with respect to the C domain. It is quite clear for example, that V-second is not a unified phenomenon, and that verb second languages vary from each other with respect to the initial field. Empirical support for this claim then derives from the insights that this structure provides in crosslinguistic differences with respect to the initial field.

3.3.4 The distribution of subjects and tensed Vs in French

Apparent doubly filled Comp violations also occur in clauses in French, if we consider the distribution of French subject DPs and the finite verb. According to the standard analysis the subject DP occurs in the Spec position of the projection containing the finite verb, say, Spec, AgrS:

(31) \[
\text{[AgrSP [Marie] [AgrS adore] [ ... [ ...... camper ‘Marie loves camping’]
\]
\]

As in the V second case, we must conclude that this is not the correct analysis: the subject DP is not in the Spec position containing the finite verb, but rather occurs in some higher Spec position:

(32) \[
\text{[YP [Marie] [Y ....[ [AgrSP [AgrS adore] [ ... [ ...... camper ‘Marie loves camping’
\]
\]
\]
\]

This conclusion is reached in Sportiche (1992), (1995) and Kayne (1994) for completely different reasons: clitic pronouns and negation intervene between the subject and the finite verb. These clitics are argued to occupy either the head or the Spec position of their own projections, which forces the subject DP to even higher (Sportiche argues they are in NomP (nominative P) which is
distinct from the position in which Agr is triggered (AgrSP)). If this is correct, the finite verb is never in the head position of the projection that contains the subject DP.

In sum, it is clear what the general solution for this class of problems is: one must assume more structure, and support this structure with both language internal and crosslinguistic evidence.

3.4 Good cases: Head marking and Spec marking

3.4.1 Where the head is overt and the Spec is silent.

The modified LCA allows heads of projections to be overt, but their Spec positions to be silent. Many configurations that are generally thought of as somewhat exceptional, are actually completely transparent under this view. I discuss several such cases in this section, starting the discussion with cases where the head is overt, and the Spec is silent. I will consider English and Dutch yes/no questions, Dutch imperatives, and VSO languages.

English yes/no questions exhibit either I to C movement in root clauses or if/whether in embedded clauses. It is in general assumed that a silent operator occurs in Spec of the +Q projection. This yields the following representation. (See the preceding section for the particular conclusions about the position which whether occupies):

(33) V first (yes no questions), with V to C movement (main clauses or if/whether)

a. \[ Q_P \quad OP \quad [Q \ V_f] \quad [\ldots \ (did \ John \ leave) \]

b. \[ Q_P \quad [if] \quad (if \ John \ left) \]
\[ W_hP \quad whether \quad [Q_P \quad [e]] \quad (whether \ John \ left) \]

These configurations conform to the modified LCA: since the head of the projection is overt, the Spec position is silent.

Dutch yes/no questions operate in much the same way. In root yes/no questions, the finite V moves to the +Q head. Since the V occurs in the +Q head, Spec, QP is silent. In embedded
yes/no questions, the +Q head is realized as a lexical complementizer (of) that may optionally be followed by a declarative C dat:

\[
\text{(34) } \quad [\text{OP } [Q [C [.. (cov) \text{ of (cov) dat...}}]
\]

A new problem arises with respect to root yes/no questions, which is in fact a very old problem: given that Dutch is a V-second language, why are these structures V first and not V second? In section 3.3.1, we have seen that V second arises by obligatorily moving some XP to the a projection higher that then the one containing the finite verb. Note that this is also possible in (root) yes/no questions, as expected, given the analysis:

\[
\text{(35) } \quad \text{Met Marie heb je ook gepraat?}
\]

With John have you also talked

It is however not necessary. The question of why these structures may be V-first can be rephrased in terms of the availability of the higher projection or not. If the projection is unavailable, V-first arises. If it is available, V-second arises. What then determines the availability of the higher projection? Here there are two possibilities. Either the higher projection may simply be absent from the structure, or perhaps more interestingly, the projection must always be there, but the entire QP has pied-piped to the Spec of the projection. If the QP is in the highest Spec position, the head of this position must be silent by the modified LCA:

\[
\text{(36) } \quad [\text{TopP [QP Vf...[.. [Top^e] [Ope]}}]
\]

Imperatives also conform to the pattern that we expect. In Dutch, for example, imperatives involve V movement to a C-type position above the subject. The resulting string is V-initial. This pattern is compatible with an analysis that postulates an empty operator in the Spec position of the imperative head:

\[
\text{(37) } \quad \text{Imperatives (V-second:)} \quad \text{(Dutch)}
\]
a. Geef (jij) dat maar terug!
Give you that only back

b. [ OP IMP Vf [ jij ...]

There is of course much more to be said about imperatives, but the main point is clear. Imperatives are verb first because the head occurs in the imperative head position, and the Spec of this projection must therefore be silent.

3.4.2 VSO languages.

Consider next VSO languages, like Irish, and Welsh. In tensed clauses in these languages, the finite verb is preceded by a number of heads that express in linear order clause type complementizers, negation, the finite V, followed by tense and Agr morphemes, followed by the lexical subject. The order of the preverbal heads correspond to the basic hierarchical order. Since head movement can only be left adjunction, it follows that these elements occur in the head position of distinct projections. This yields the following structure, which assumes the standard analysis for the subject DP: it is outside the lower VP, in Spec, TP (or maybe in some lower functional projection, Koopman and Sportiche, 1991, McCloskey, 1994):

(38) C
    overt   Neg
    overt
    pro     Agr
    V-T-Agr
    DP
    T

Projections containing overt head positions, cannot have their Spec positions filled with overt lexical material. This yields strictly head initial structures. The lexical subject can be in Spec, TP
because T is covert: T has incorporated into Agr. This structure directly accounts for a salient property of Celtic languages, stated below:

(39) pro triggers full agreement
    lexical DPs do not trigger full agreement

Lexical DPs fail to trigger agreement, simply because they cannot reach the position in which Agr is triggered. They cannot reach this position because AgrS is overt (and therefore Spec, AgrS must be silent). Pro on the other hand is covert; since it is covert it can reach Spec, AgrS. Hence full agreement is possible with pro.78

Comparing Irish with a verb second languages like Dutch raises a number of interesting questions. If declarative root clauses in Dutch contain a high topic like position that relates to discourse, and if languages do not vary with respect to the initial structure, what happens to this projection in Irish? Why doesn’t Irish allow some XP in root clauses to go the initial Spec, Topic position, just as Dutch does? Since this does not seem to be possible, it must mean that the initial position is unavailable in Irish. But if it is available in Dutch, it should be in principle available in Irish as well: we cannot accept an answer that simply says that this projection is unavailable in Irish. I would like to pursue the idea that no Topic XP can appear to the left of the verbal complex in declarative root clauses, because the entire clause has pied-piped and is occupying this position.

(40) Dutch: [YP XP [ Y [CP [Vf [ ...

Irish  [ [CP C V-T- Agr .......]] [ Y [ CP e ]

7As pointed out by Ian Roberts, this analysis does not account for another property of Celtic languages: why cannot wh-phrases move through this position and trigger agreement. This fact might be related to a much more general fact concerning extraction from Spec, IP. See 3.6.2 and footnote 14 for more discussion.

8This analysis carries over to the slightly more complex agreement facts in Arabic, if person, number and gender each head their own projections, as in Schlonsky (1989), with V moving to Number. [V+num] DP gen [. Thus, gender agreement can be triggered by the subject DP, but number agreement cannot, because the head of Num is overt.
Under this view, the difference between Irish and Dutch reduces to a difference in the category that pied-pipes, with clausal pied-piping in Irish, and pied-piping of some smaller constituent in Dutch.  

### 3.4.3 Where the Spec is overt and the head is silent

We have seen many examples of this configuration. As soon as a language learner has a reason to analyze a XP containing overt material as occupying a Spec position, s/he also automatically knows that the head position of that projection must be covert. This configuration is compatible with an analysis of topicalization in English which involves an empty topic head.

### 3.5 On Interactions between heads and Spec marking.

Let us next turn to interactions between head and Spec marking. Consider a language with the following characteristics:

(41)  (i) there is a lexical item in the head position (say, negation, focus, Agr):

(ii) there is independent leftward XP movement to the Spec of this projection under certain conditions

These two properties can conspire to yield a forbidden configuration, with both Spec and head containing overt material. Several things can happen. Either the head moves higher (yielding VO structures), or the Spec moves higher (yielding scrambling). Or either the head or the Spec is forced to be silent in such configurations (head drop or Spec drop). I restrict the discussion to head and spec drop, and discuss the disappearance of negative heads as a particular example of head-drop, and pro-drop as a particular case of Spec-drop.

---

9If I were to pursue this issue in more detail in this paper, I would show that Dutch also instantiates the Irish pattern in certain types of declaratives that do not have an overt topic. Quite generally, languages will exhibit much more mixed properties than traditional analyses assume.
3.5.1 Where heads disappear.

3.5.1.1 negation

In certain Romance languages the negative head disappears but only when a negative XP
precedes the finite verb and the clitics. This is illustrated for the Italian in the following example:

(42)  a. nessuno è veneto /* nessuno non ha visto Mario

Nobody is come
‘Nobody has come’

b. Non ho visto nessuno

Not have seen nobody

c. Niente ho detto

Nothing, I have said

Based on the fact that only one negative XP may occur pre-verbally, which points to a unique
landing site of this constituent, the standard analysis has the preverbal negative XP occupying
Spec, NegP. If this is correct, we can now understand the disappearance of the negative head as
forced by the revised LCA. (This analysis is identical to Sportiche’s (1992) proposal to treat the
disappearance of the negative head as a doubly filled Comp effect (his doubly filled Voice filter).
Italian seems to allow the two configurations predicted by the LCA, with either the head or the
Spec overt, but not both:

(43)  a.  [NegP [ non ]

b.  [ NegP NegXP  [ e] ]

c.  *[NegP NegXP [ non ]

The LCA proposal makes very specific predictions; it only blocks (43c), if NegXP occurs in Spec,
NegP. This means that no lexical material should be able to intervene between the negative XP
and the position in which non should surface (i.e. the position preceding the accusative clitics). If
the NegXP were able to reach a higher Spec position, the negative head should be able to
reappear. There are indications, both internal to Italian and across Romance that indicate that this is basically correct, although the matter deserves more careful investigation.

In Italian, the examples cited in the literature where a non-negative negative XP precedes the finite verb are always of the form in (42c), in which pro-drop has applied. It is highly suggestive that overt pronouns do not seem to be able to intervene between the negative XP and the finite verb:

(44) a. Niente ho detto
   Nothing, I have said

   b. ??Niente yo ho detto
      Nothing, I have said

This seems to indicate that the analysis above is on the right track, although there are also indications that the point to a greater complexity\(^{10}\)

Variation across Romance seems to indicate that this prediction is basically correct however. Some languages (Catalan) allow preverbal negation to be absent or present with a preposed negative XP. This would be consistent with optional further movement of the Negative XP. Secondly, Susan Garret (1995) presents a nice historical argument in favour of this view on the basis of the history of negation in Spanish. She shows that 12th-16th century Spanish allowed the negative head to cooccur with an initial negative XP to cooccur or to drop. She further shows that the obligatory disappearance of the negative head from the 16th century on correlates with the disappearance of a initial Spec position higher than negation. This pattern would be entirely expected:

(45) Spanish (12-16th Century)

\(^{10}\)Zanuttini (1991, p. 61) cites examples like

(i) A nessuno Gianni ha parlato

It is unclear what to say about the absence of non in such cases. For other complex cases, see Zanuttini (1991), p. 131 ff.
Depending on whether the NegXP occurs in Spec NegP or higher, the negative head is forced to be absent or present. When the higher YP in (45a) became unavailable, negative head drop became obligatory with preverbal negative XP:

(46)  [ NegXP [ Neg ]

3.5.2 Where Spec disappears (Dependent on configurations)

The mirror image also occurs, where it is not the head that drops, but rather the Spec. This Spec drop again is configurationally determined. I discuss in turn topic drop in Dutch and pro-drop in general.

3.5.2.1 Topic drop (Dutch)

Dutch and German allow D-type pronominals to be dropped in root clauses in which V-second has applied:

(47)  a.  [pro [ weet [ ik niet
          Know I not

            b.  *ik weet pro niet
                 I know not

It is well known that the pronoun can only be dropped in a particular structural configuration. Give our discussion so far, we have a logical candidate: the pronoun is dropped in the Spec position of the projection containing the finite verb:

(48)  [ pro [ Vf ]

It is often assume that topic-drop is optional, and that the same structure underlies (47) and (49):
Again, this analysis is unavailable, because of the revised LCA: the overt d-pronoun cannot be in the Spec position of the projection that contains the finite verb. Rather, the situation must be assumed to be as in (50):

(50) a.  [ pro  [Vf
       b.  [dat₁ e [ e₁ [ Vf

There is in fact quite interesting evidence that there are two distinct projections: some Dutch constructions, like imperatives, allow for topic drop, but not for overt topicalization of the d pronoun.\(^\text{(11)}\)

### 3.5.2.2 Pro-drop

Dutch and German show extremely clear cases of configurationally determined pro-drop. It has been argued in the literature that Chinese object pro is licensed in a particular structural

\(^{(11)}\) This is illustrated in the following examples:

(i)  [ pro  [ geef [ maar terug [ e
       give    but   back

(ii).  *dat geef maar terug
       that give but back

Interestingly, the situation in German is exactly the opposite:

(iii)  das gib mal zurück
       that give but back

   .  *gib mal zurück
       give but back
configuration as well (Cheng, 1989). This raises the possibility that pro-drop in general falls under this generalization (cf. Koopman, 1993 for some discussion).

Pro-drop is forced by the LCA if there is an overt element in the head position of that projection.

\[(51) \quad [\text{pro} \quad [\mathbf{X}]]\]

Can (51) be strengthened to (52)?

\[(52) \quad \text{pro-drop iff there is an overt element in the head position}\]

There certainly should be cases of pro-drop that fall under this general configuration. It is less clear that all cases of pro-drop can be brought back to the configuration in (51), although this is certainly an idea that I would like to explore more seriously in future work. Here are some problems. The LCA only has something to say about head or Spec-drop in cases where both would be lexical: if the spec is silenced pro-drop occurs. The LCA has nothing to say about whether pro is allowed in Spec position with a covert head. I return to this general type of configuration below. Furthermore, any account of pro-drop needs to be able to capture the relation between “rich agreement” and pro-drop: in many cases, there must be rich agreement, i.e. there must be an overt head to “identify” pro. In many languages, some tenses will license pro-drop, other will not. If the head is not “strong” enough, Spec must win, i.e. pronoun must be overt. One way to make this consistent with (51) is to say that rich agreement licenses pro-drop, because the agreement head is occupying the head position of the projection in which pro is licensed. With “poor” agreement, the head simply does not end up in the right structural configuration, but stays lower. This again presuppose a more articulate structure, with basically split agreement heads (person, number and gender). Independent support for this comes from the fact that languages do not treat all pronouns as being equal. There are often differences in the distribution of first second and third person pronouns, and singular and plural pronouns. Besides this type of solution, there could still be another different way to derive pro-drop: prod-rop could arise when overt pronouns and a bigger XP compete for the same Spec position:
If a bigger XP occupies the Spec position of the relevant agreement projection, the head of this projection will need to be silent (by the LCA). The pronoun needs to be silent as well, hence the appearance of pro-drop, since the position that allows it to be overt is not available. Such an account possibly extends to pro-drop in imperatives.

### 3.6 Covert categories: traces and heads of chains

One configuration remains to be examined: the configuration where both Spec and head is covert. Here we must distinguish between several possibilities: the covert category is a *trace* (e.g. not the head of a chain), or *covert HC* (a covert element heading a chain). This yields four possibilities:

(53) 

```
YP
   \[ pronoun \]
   Y
   XP
```

(54)a. 

```
YP
   XP
   \[ trace \]
   X
   \[ trace \]
```

(54)b. 

```
YP
   XP
   \[ trace \]
   X
   \[ trace \]
```

(54)c. 

```
YP
   XP
   \[ trace \]
   X
   \[ covert HC \]
```
It is clear that the configuration in (54a) seems to arise quite often. In fact, it seems that it must be allowed: in many cases the thematic domain of V only seems to consist of traces, and everything has moved out higher. I will simply assume that (54b) and (54c) should be allowed, and won’t discuss these configurations any further. Instead, I would like to concentrate on the configuration in (54d): can both the Spec and the head of a projection be covert heads of chains? Certainly standard practice allows this. For example, English declarative clauses are often considered to have a silent declarative C and a silent Spec as well. This silent projection thus would contain both a silent head of chain in its Spec, and a silent head of chain in the head position. I would like to explore the idea that this configuration is actually not allowed.

(55) No projection can have a silent head of chain in Spec position and in the head position.

Why would this configuration not be allowed? What is wrong with this configuration? In every day practice, silent heads of chains are standardly assumed and contribute to the semantic interpretation. But this raises a general question: why do there appear to be no languages in which all heads and Spec are silent, and in which everything simply remains in the thematic domain of the VP? Why does syntax make use of such elaborate movements? Why does heavy pied-piping exist? Why do we find the two configurations (spec are overt or heads are overt). Suppose that what is wrong with (55) is that these projections cannot be interpreted. In other words, suppose that for Full Interpretation to be satisfied the following must hold\(^\text{12}\):

(56) A projection is interpretable iff it is activated by lexical material.

\(^{12}\text{This proposal is similar in spirit to Cheng (1991) clause-typing proposal. Cheng proposes that a wh-question must be “typed” as such at S-structure.} \)
Each projection must be “activated”, i.e. lexical material must be associated with either the Spec or the head of a projection in the course of the derivation. It is quite easy to see that this proposal will force massive overt movement. This quite simple proposal has exciting and far-reaching consequences, and allows us to sketch some answers to the questions that I raised above. I will briefly discuss these below, but turn first to some analytical consequences of the proposal.

### 3.6.1 English main clauses

An old and yet unsettled problem concerns the analysis of English main clauses. English main clauses look to be no bigger than IP. Yet they belong to a particular clause type, declarative clause (CP). In other languages, main clauses are clearly CPs. There have been two approaches to this problem in the literature. Some linguists argue that since English main clauses do not have the appearance of CPs, and look like IPs, they are what they look like, i.e. they are IPs. Under this view, languages may vary crosslinguistically with respect to the category of root declarative clauses. This analytical option is unavailable to me, because I assume clause types are universally represented in the same way: a declarative clause in language X is represented as a declarative clause in language Y. My view is more compatible with other linguists who argue that since declarative clauses are CPs in some languages, they are CPs in all languages. Therefore, these linguists conclude, English main clauses are CPs, with a silent C node, and presumably a silent declarative operator, and an IP complement.

\[(57) \quad \text{CP} \quad \text{Op} \quad \text{C} \quad \text{IP} \quad [\text{decl}]\]

This analysis is incompatible with (56), since the declarative head is not associated with any lexical material at any stage of the derivation, and therefore uninterpretable. If (56) is correct, the language learner is forced to analyze English main clauses as involving clausal pied-piping:
Since a clausal constant is in Spec, CP, C will be empty by the LCA. Embedded declarative complements trivially satisfy (56) when an overt C node is present.

When C is absent, as is possible in English, (56) is satisfied either because C is a trace of C which has incorporated into V (this means that CP was associated with lexical material at one stage of the derivation):

Or alternatively, C can be absent, because IP has pied-piped to Spec, CP, as in (58). This latter proposal runs into the problem with accounting why C can only be absent in “head government” configurations (which reduce to incorporation configurations).

---

13Note that we can now almost understand why an incorporated C is never lexical. The head of the chain does not activate any projection, and only serves to activate the projection containing the trace of C. Head movement of a silent head, is thus another way to activate projections.
Given (56), then, English has overt pied-piping of clausal constituents, just as Nweh has. (56) makes English into a much more mixed word order language than generally assumed, and has quite far reaching consequences for the analysis of many phenomena. In particular, it has consequences for clauses containing focus, negation, and Beghelli and Stowell’s (1994) DistP and ShareP etc (I am assuming that these projections are present iff they are needed for interpretation), which will all need to be activated by movement of some lexical material. Here I will concentrate on one particular consequences and proposes a reanalysis of the that-t effects in English.

3.6.2 Reanalyzing the that-t effects.

The analysis of the that-t effect constitutes an old problem. Subject extraction in English root wh-questions does not trigger do-support, and extraction of the subject immediately adjacent to C forces that to be absent:

(61) a. who came yesterday?
    *who did come yesterday?

   b. who did you think came yesterday?
    *who did you think that came yesterday?

The traditional analysis has the subject wh-phrase move to Spec, WhP, at least for (61b). With respect to the analysis in (61a), we find a familiar split. Some linguists argue that these wh-questions are simply IPs, others that they are CPs with the wh-phrase moved to Spec, CP. The impossibility of SAI or the obligatory absence of that is attributed to some property that the empty category in the extraction site must satisfy. Crosslinguistically, there are numerous problems arising with respect to subject extraction. One problem for instance is that some languages do not seem to allow for extraction out of the subject position at all. This is for example the case in Italian, where extraction must proceed from the postverbal subject position (Rizzi 1982). Suppose that the Italian situation is not exceptional, but in fact represents the norm:
a wh-phrase can never be extracted from the Spec position immediately c-commanded by C.

(where by “subject” position, we understand the “highest” subject position, i.e. the Spec position immediately below the C node)\(^\text{14}\).

We can now understand the English facts differently. Since the wh-phrase cannot be extracted from the subject position, the traditional analysis in which wh moves to Spec, WhP is unavailable:

\[
\begin{array}{c}
\ast \quad [\text{who} \quad \text{Wh} \quad [e \quad Q[ \quad C ]]
\end{array}
\]

This raises the question how the Wh projection is activated. There is no other option then to pied-pipe the entire clausal constituent to Spec, WhP (as I have argued before, the Wh projection combines with the Q projection)\(^\text{15}\).

Thus English resorts to the analysis that Kayne (1995) argues for quite generally in certain wh-in-situ languages. The wh-projection is activated by the lexical material in its Spec position. If this movement proceeds through Spec, QP, the Q projection is activated as well. The impossibility of

---

\(^\text{14}\)This also allows us to understand a well-known phenomenon in Celtic languages, which is that subject wh-phrase never trigger number agreement on V: only pro triggers number agreement. In order to trigger full agreement, wh-phrases must move through the highest subject position. Extraction from that position is impossible by (62); therefore wh-phrases cannot trigger number agreement.

\(^\text{15}\)SAI inversion would not help, since the inverted I ends up in the Q (see 3.3.3), not in Wh.

\[(i) \quad [\text{who} \quad [Q\text{did}] \quad \text{Wh}]
\]

It is not clear that the language learner will ever come up with such creative solutions as in (i) if these do not match the primary data.
do-support follows from the structure: the IP is simply too high, and I to C to Q movement would yield an improperly bound trace in the highest IP.

The same analysis applies to subject wh-phrases in embedded complements. The wh-phrase cannot be extracted from the subject position, because that position universally cannot be extracted from. The IP therefore pied-pipes to Spec, CP, out of the c-command domain of C, from which the wh-phrase further extracts to Spec, WhP. Since IP is overt, C must be silent. That must therefore be obligatorily absent: it is a doubly filled Comp filter effect:

\[
\text{Spec overt} \\
\text{Head silent}
\]

The analysis in (65) can be easily extended to derive possible questions as in (66)\(^{16}\):

\[
[[CP][IP \text{ who came } [CP] \text{ e}] [IP] [[WH] \text{ do } [CP] \text{ you } [CP] \text{ e} \text{ think } [CP] \text{ e}] [IP] \text{ e}]
\]

It is interesting that the analysis of wh-questions in English is not uniform: within English, one finds the same variation as observed crosslinguistically.

I take these patterns as very strong evidence in favor of (56). (56) obviously has consequences for the analysis of many other construction types. Imperatives will involve either head movement to the imperative head (as in Dutch), or pied-piping to the Spec of the imperative

\(^{16}\text{As suggested by Anna Szabolci (1994, p 203).}\)
head. Negation will involve either an overt head, or overt pied-piping of a negative constituent to Spec NegP. Languages with no overt Ds will have to be pied-piping languages, where a XP is in Spec, DP, etc. (56) forces the language learner to assume massive pied-piping in cases where the head is silent, and as such is an extremely powerful, yet restrictive, principle. I will explore these questions more fully in future research.

4. Some preliminary answers

Let me now return to some of the more general questions. This paper contains three interrelated, but logical distinct proposals.

1. The (modified) LCA applies only to terminal elements, and c-command is not restricted to categories. This proposal derives the doubly filled Comp filter. I have briefly examined apparent violations of the doubly filled Comp filter, and presented alternative analyses for these. I have tried to show that these analyses are independently needed, and are in fact necessary if we even want to start to talk about crosslinguistic variation in this domain.

2. Languages are expected to have overt heads with silent Specs or silent Specs with overt heads. This expectation is still valid regardless of whether the doubly filled Comp filter derives from the LCA, or whether it is some economy principle. I discussed some cases that fit the configurations well, and show how these configurations provide a simple analysis for patterns which have been felt to be problematic so far, but that in fact represent the norm. I also discuss some cases where the actual surface word orders derive from the interaction of leftward movement to Spec and the presence of a head. I argued that two phenomena fall under this heading: head drop and pro drop.

3. Languages disallow projections to be headed by silent covert heads and Specs. In particular, I proposed a principle that requires a projection to be associated with lexical material at some point in the derivation. This principle basically answers the question of why syntax makes use of so many movements, and why we seem to be heading towards the idea that everything must move, at least once. The idea here is quite simple: projections must be activated to be semantically interpretable. Projection Activation happens by associating overt lexical material to either Spec or head at some point in the derivation. Syntax thus uses few lexical items, but puts these to
maximum use. Lexical items are used to form elaborate syntactic structures from which meaning can be computed. The formation of these elaborate syntactic structures can only be achieved in one way: by movement of some constituent containing a lexical item. By the LCA, movement is further restricted to movement of some XP to a Spec position of an empty head, or movement of some head position with a silent Spec position. This yields the two basic configurations that we appear to find within languages: some XP occupies the Spec position, and the head is silent, or a projection contains a head, and the Spec is silent.

I have thus provided basic answers to the different questions raised in this paper. I will repeat these here:

(67)  
a. Why precisely do we seem to find precisely the two configurations in (10), repeated here below, crosslinguistically:

\[
\begin{align*}
[ & [ \{X \} ] & [ ] & \ldots & [ ] & ] & \text{Head movement to some head position } Y, \text{or} \\
[ & [ \text{XP} ] & [ & \{Y \} ] & [ ] & [ \text{XP} ] & ] & \text{Movement of some XP to Spec, } YP
\end{align*}
\]

b. what motivates (heavy) pied-piping?

c. If heavy pied-piping is so heavily used, why did it take us (linguists) so long to discover it?

d. Why do there appear to be no languages in which all heads and Spec are silent, and in which everything simply remains in the thematic domain of the VP?

The answer to these questions is simple: projections must be activated to be interpretable; this can be achieved either by moving a constituent to the Spec position of a projection, or by moving a head to the head position of a projection: we thus find the two configurations above. Projection activation also partially explains (67b). (Heavy) pied-piping is a means to activate a projection if the head is silent. A question remains however. Why do languages pied-pipe different types of constituents? Take English wh-questions for example. According to my analysis, English wh-questions involve either pied-piping of a small wh-XP to Spec, WhP (who did you see), or pied-piping of an entire IP (who came \{e\}) to Spec, WhP.). The latter is forced, only because the extraction of a smaller XP fails. A fuller answer to this question must wait till we have more
insight into pied-piping. The modified LCA provides the answer to (67c). Pied-piping is often hard
to detect, because the head must be silent in that case. So, for overt evidence for heavy pied-
piping we must rely on certain configurations of data that do not seem to arise that frequently.
(movement of a big constituent to some Spec position to the left, and stranding of an overt head
immediately below this projection to the right: (as usual, positions containing overt material are
boldfaced.)

(68) \[
\begin{array}{c}
\text{[[ XP ] [ Y [ Z [ XP e]]]} \\
\end{array}
\]

Finally, my proposal also allows a beginning of an understanding of (69d): languages are not
allowed to leave all lexical material in-situ simply because this will yield a Full Interpretation
violation. What needs to be explained though is why languages cannot simply raise their VPs
through the different Spec positions, thus activating them on their way, and giving the appearance
of a language that has everything in-situ. Here I would bring in an additional consideration. Not
every constituent can activate a particular head: there must be a semantic or maybe morphological
relation beteen material contained within the pied-piped phrase and the head, which further
restricts possible movement to Spec.
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[Published in 1992 *NLLT* 10, 555-94]


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