Heads and Specifiers: on Spec-head word orders in English

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Abstract

This paper explores asymmetries in spec-head word order in English and demonstrates that there is only mixed empirical evidence in English to back up the prediction of the Linear Correspondence Axiom (LCA, Kayne 1994), that specifiers universally precede their heads. It will be argued that there is an alternative to the LCA. It is proposed that under some circumstances PF can locally invert the order of a specifier and its head in order to conform to linearization requirements. This derives the facts in a constrained and simple way and, in so doing, allows for the removal of some types of head movement (i.e. short V-v raising) from the grammar of English as well as the simplification of the CP layer.

Keywords: PF interface, output conditions, linearization LCA normalization specifier Spec-head head-Spec

1. The problem

Within the Principles and Parameters framework, the Head Parameter allowed, in principle, for either heads or specifiers to occur on the left or right. However, there appears to be an asymmetry between heads and specifiers: while heads can indeed occur on the left or right, there seems to be the case that "no clear case of a generally Specifier-final language has been discovered" (Roberts 1997:26). Kayne (1994) also notes that while even within single languages, head-complement orders are much more stable and harmonic than head-specifier orders.

One response to this was the Antisymmetry framework. According to Kayne (1994), the specifier of a head will always precede the head in linear order. This is because a specifier asymmetrically c-commands its head and consequently, assuming the Linear Correspondence Axiom (LCA), there is a 1-to-1 mapping from asymmetric c-command to linear precedence.

(1) Linear Correspondence Axiom: d(A) is a linear ordering of T; where P is a phrase marker with T the set of terminals and where A is the maximal set of ordered pairs <Xi,Yj> such that for each j, Xj asymmetrically c-commands Yj (Adapted from Kayne 1994:5–6)

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The antisymmetry framework thus responds to the asymmetry between complements and specifiers by making both equally rigid in terms of word order: heads precede complements; specifiers precede heads. The fact that specifier-head orders are less stable than head-complement orders is not directly encoded in the LCA and empirically things are not as neat as the LCA suggests.

In this paper, I will show that it is not entirely clear that specifiers do, in fact, precede their heads in all situations and a heterogenous set of auxiliary assumptions are required to explain the word order facts (including null heads, obligatorily empty specifiers, unmotivated head movement etc). At this point, let me be clear that I am simply evaluating empirical evidence for the Spec-head claim in English. I am not arguing that the LCA is generally incorrect (since it is axiomatic) or otherwise unfruitful, or that specifiers never precede their heads. In fact the Antisymmetry paradigm has raised fundamental questions leading to interesting proposals over the years. I will, however, propose an alternative mapping which can account for the asymmetries in Spec-head orders. And to the extent that it succeeds, it raises questions about some of the ancillary assumptions that are required under the LCA. I also acknowledge that the proposal in this paper cuts to the core of some linguistic holy cows and has implications for a range of constructions. Unfortunately, it is simply not possible to cover all of these within a single paper, perhaps not even a book. So this paper restricts its aim to "pushing a precise but inadequate formulation to an unacceptable conclusion" (Chomsky 1957:5 cited in Franks (2000)) in the interests of opening up debate on these issues.

The paper consists of five broad sections. Section 2 evaluates the empirical evidence in English for Spec-head linear orders. It will be shown that with a few exceptions, there is little direct evidence for Spec-head orders; that head-Spec orders are the rule rather than the exception in English. Section 3 draws some empirical generalizations from the data presented in the previous section. It will be shown that the only Spec-head orders in English are generally those associated with an AGREE relation where the interpretable feature precedes the (checked) uninterpretable feature. This generalization is formalized in an analysis which proposes an alternative to the LCA which maps grammatical dependencies to linear precedence in a way that captures the empirical facts and leads to a reduction in the number of subsidiary hypotheses necessary. Sections 4 and 5 apply these insights. Section 4 explains how the proposal provides an explanation for short *v*-V raising. Section 5 expands on the implications of the proposal for the CP layer in general and topicalization constructions in particular.

2. The linear orders of specifiers and heads in English

This Section evaluates the orders between English heads and specifiers in the following major domains: (i) TP/IP (ii) CP (iii) VP (iv) *v*P (v) PP. Of these, the only clear instances of a Specifier preceding the head are in the TP and the CP Focus domains. All others seemingly display Head-Spec orders.

2.1. SpecTP

The canonical example of a specifier which precedes its head is SpecTP.

(2) a. I want John to come

b. John will probably come

c. John has probably come

The subject precedes the infinitival marker *to* (2a), as well as auxiliaries and modals (2b,c). On the understanding that the adverb in the previous sentences marks the left edge of the *v*P, the fact that the modal and auxiliary are themselves to the left of the adverb shows that these verbs are in T^{o} with the resulting implication that the subject is indeed in SpecTP.

2.2. SpecCP

However, other spec-head orders are much more difficult to determine, not least because a null head typically cannot yield any evidence of linear orders. For instance, an overt complementizer cannot co-occur with a filled specifier, an effect traditionally accounted for by the Doubly Filled Comp filter.

(3) a. I wonder who (*that) arrived?

b. I wonder (*that) who arrived?

However, in do-support constructions, where the dummy verb *do* is in C^{o}, the specifier precedes the head.

(4) What do you want?

There is also evidence from closely-related languages that a WH-item in a specifier position precedes the head.

(5) a. For who that would him wel avise, what hath befalle in this matiere
For who that would him well advise what has happened in this matter
'Whoever realizes well what in this thing some men befell' (Brodie 2007:Gower: Confessio Amantis, Book I)

b. Ik weet niet wie dat Jan ge-zien heeft
I know not who that Jan prt-seen has
'I don't know who Jan has seen' (Haegeman 1991:382)

c. Jef eid iemand ge-zien, mo ik weet nie wou da
Jef has someone prt-seen but I know not who that
'Jeff saw someone but I don't know who' (Van Craenenbroeck 2004:13)

Example (5a) from Middle English shows a WH-item in SpecCP, preceding the complementizer. Flemish also demonstrates the possibility of the WH-item preceding the complementizer (5b) and example (5c) is from Wambeek Dutch, where

in elliptical contexts a WH-item can precede a head that has the same form as a complementizer.[1] To the extent that these examples from closely-related languages are generalizable to English more generally, they demonstrate that WH-items in SpecCP precede the head of C⁰.

2.3. SpecVP

Turning our attention to the VP, I assume that when V selects a clausal complement, the direct object is in a specifier of V. However, 'big' V appears to precede its specifier, resulting in V-O word order (6a) with the O-V word order that represents Spec-head order being ungrammatical (6b). The same applies in passive contexts (7a,b) The V-O order is arguably due to short v-V raising which moves V to a position preceding the object. So the underlying Spec-head, O-V pattern is obscured by subsequent movements (Barbiers 2000). It is, however, worth noting that to date, there is no widely accepted reason for why v-V raising should occur at all in English and it appears to be used simply to derive the correct word order.[2] Consequently, there is no direct evidence that SpecVP precedes its head; derived, surface order shows that the V head ends up preceding the specifier.

(6) a. I told John t that I don't like Peter

b. *I John told that I don't like Peter

(7) a. I have beaten John

b. *I have John beaten

It might be countered that in pseudo-causative contexts, the DP Object precedes V as in (8a). However, in this example, it is not at all clear that the DP object is in the specifier of VP since an adverbial can intervene between the DP and the participle verb (8c).

(8) a. I got/had John beaten

b. *I got beaten John

c. I got John soundly/well-and-truly beaten

Additional evidence that the DP Object in (8a,c) is not in SpecVP comes from extraction facts. Example (9a) demonstrates that argument picture DPs are not islands when they occur in their base position to the right of the participle. However, in the pseudo-causative construction, when the picture DP occurs to the left of the

[1] Note, however, that Van Craenenbroeck (2004) analyses it as a demonstrative pronoun.

[2] That v-V raising is language-specific is highlighted by the fact that it putatively does not occur in languages like Dutch (Barbiers 2000) and Afrikaans.

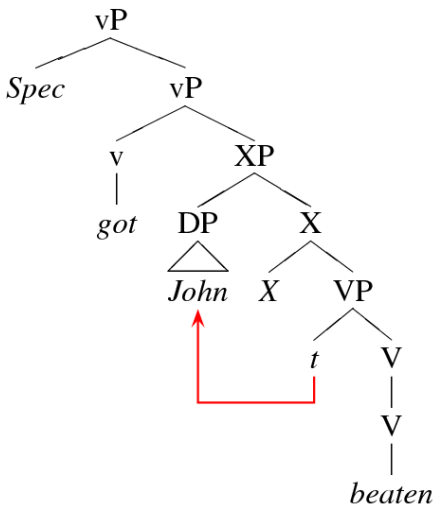
participle it is an island (9b). This demonstrates that for the pseudo-causative, O-V order, the DP is in a derived position and is thus very unlikely to be the specifier of VP.

(9) a. Who did you take a picture of *t* last week?

b. *Who did you get a picture of *t* taken last week?

Furthermore, from a semantic perspective, it would appear that the DP could equally well be an argument of the pseudo-causative verb, *got*. In fact, this raises an interesting problem: (a) the adverbial intervention and extraction facts show that the DP is not in SpecVP, yet (b) since the DP follows the pseudo-causative verb, it cannot (according to the LCA) be in the specifier of the pseudo-causative verb itself, but must be in the specifier of a null (and unidentified) head (see the diagram in (10)).

(10)



The upshot of all this is that there is little evidence to suggest that the specifier of VP precedes V; the O-V order is obscured by subsequent movement.[3]

2.4. SpecvP

Little *v* also seems to precede its specifier in existential constructions which are usually analyzed as having the subject remain in its *in situ* position in Spec*v*P.

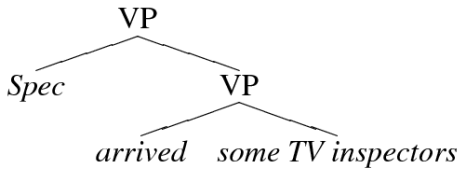
(11) There arrived some TV inspectors at the door

This word order must be explained in one of two ways. First, it could be postulated that V-raising occurs to some position between T and v (cf. Jonas and

[3] Furthermore, it is interesting to note that in both declarative and pseudo-causative contexts, in order to maintain the idea that Specifiers precede heads in English, movement to null heads is necessary. I hasten to add that this observation does not amount to a denial of the possibility of null categories in contexts where they are motivated.

Bobaljik (1993) for Icelandic). However, this is less than convincing because English is notable for lacking V-raising out of *v*P (unlike French for example (Emonds 1978)). The second option would be to argue that the class of verbs allowing existential constructions (i.e. unaccusatives) do not have an articulated vP shell but rather consist simply of VP with the DP as the complement (Alexiadou et al. 2004). If the unaccusative verb lexicalizes the head, then the head would precede the DP.

(12)



However, this raises issues of its own. First, note that this analysis leaves the Specifier of VP obligatorily empty and thus provides no evidence that the specifier precedes the head. Second, if the DP remains in situ, then there remains the question of why this is necessarily the case – especially when SpecVP remains a viable landing site. In summary, there is little evidence to suggest that Spec*v*P precedes its head; once again, the underlying S-V order is obscured by subsequent movements.

2.5. SpecPP

Prepositional phrases occupy an awkward position among the typology of English categories, apparently being the only specifier-less phrase in what is otherwise a language that consistently requires them. The only phrasal-material available in a PP is the complement of P which follows P in linear order.

(13) a. John is in the kitchen

b. *John is the kitchen in

One type of analysis is that P selects a DP complement although this does not explain why SpecPP is systematically and obligatorily empty in English.[4] The other type of analysis holds that there are substantial movements within an articulated structure that eventually yield the correct word order but which obscure the underlying Spec-head order in the process ((cf. Den Dikken 2008, Kayne 2005; 2001, Koopman 2000). Thus, it appears that the PP domain also does not provide evidence for specifier-head linear orderings in English.

2.6. Intermediate summary

In this Section, I have reviewed some of the main categories in English and demonstrated that with the exception of SpecTP and SpecCP, there is little empirical

[4] In Principles and Parameters theory, the specifier of PP was taken to be occupied by modifiers such as *just*.

evidence that specifiers always precede their respective heads (i.e. For SpecPP, SpecVP, and Spec*v*P specifiers either follow a head and/or the data are inconclusive).

(14)

Orderings	Predicted by LCA	Explanations
[$_{SpecTP}$ DP] > T^{0}	Yes	
[$_{SpecCP}$ DP] > C^{0}	Yes	
V^{0} > [$_{SpecVP}$ DP]	No	Short V-*v* movement to a phonetically null *v* head
v^{0} > [$_{Spec\nu P}$ DP]	No	Short *v* movement a phonetically null higher head; unaccusative structure with obligatory nonmovement to specifier
P^{0} > DP[2]	No	Obligatory non-movement to a specifier

Thus, we seem to have a problem. The evidence that specifiers systematically precede their heads is mixed at best, which is why the LCA is an axiom in the first place (as opposed to an empirical generalization). At the very least, it must be argued that in many cases, the facts are obscured by apparent movements and derivations that obscure the underlying Spec-head relations. This is, of course, a legitimate move and, in fact, the heterogenous set of movements at play are all commonly accepted in linguistic theory. In many cases, these have been theoretically illuminating and have prompted deeper research. So much the better.

However, there is another way of interpreting the facts – perhaps they are evidence that the LCA needs to be problematized. The question is not whether all this extra apparatus is useful or not, but whether there is an alternative way of deriving the facts without losing the elegance of the original principles. In particular, is there a way of directly capturing the relative stability of head-complement orders in comparison with the relative instability of orderings between heads and specifiers? The remainder of this paper is an attempt to outline such a proposal which is similar in spirit to the LCA though not in substance.

3. Empirical generalizations and a theoretical proposal

A closer inspection of the nature of the particular relationships in (14) shows some interesting correlations. In all cases where the head precedes the specifier (i.e. vP, VP and possibly PP), it is the head which selects an argument. Conversely, when the specifier precedes the head (i.e. TP and CP), there is a checking relation between the head and the DP which eventually moves to the specifier.[5] This initial generalization is stated in (15).

(15) **PF output condition #1:** For X a head and YP in the specifier of X:

a. If X selects YP, then X precedes YP in linear order

b. If X and YP AGREE then YP precedes X in linear order

The generalization in (15) is an adequate descriptive statement, but it has no explanatory value as it stands. In order to explain why (15) (or something like it) occurs, we need (i) a theory of phrase structure and (ii) a plausible PF mapping principle. Within the antisymmetry approach, the theory of phrase structure was provided by antisymmetry and the PF mapping principle consisted of the LCA indexing asymmetric c-command. I adopt a Bare Phrase Structure approach (Chomsky 1995) to phrase structure and the PF mapping principle will simply be a one-to-one mapping from partially ordered sets to linear precedence.

The theoretical lens with which I will do this is Relational Theory and the notion of a functional dependency (De Vos 2008). A functional dependency (denoted by →) P→Q holds in a set iff forall x,y ε X, if f(x,a)-f(y,a), forall a ε P then f(x,a)=f(y,a), forall a ε Q (MacCaull 2000:3). That is, a functional dependency is simply a one-to-one relationship, formally defined. I take it as unproblematic that syntax includes reference to various dependencies in general and functional dependencies in particular since these are implicitly assumed in Chomsky (1995) and Lasnik and Uriagereka (2005) amongst others. A functional dependency indicates a partially ordered set (which, more precisely, is strictly ordered if the set is dyadic; the partial orderings only become apparent when there are more than two elements in the set). A partial ordering does not necessarily entail a linear ordering, but is rather, informally, a directional dependency within the set. With this in mind, consider the relationships between heads and specifiers are listed in (16).

[5] Following Chomsky (2001), MATCH involves uF probing its domain for an equivalent interpretable feature; AGREE checks or deletes the features on probe and goal; MOVE remerges the DP into the specifier position as a consequence of EPP and/or movement to the edge of a phase.

(16)

Orderings	Nature of spec-head relationship	Direction of dependency
[$_{SpecTP}$ DP] > T^{o}	AGREE: TP checks uφ on T	↔
[$_{SpecCP}$ DP] > C^{o}	AGREE: DP checks uWH on C	→
V^{o} > [$_{SpecVP}$ DP]	Selection: V selects object	→
v^{o} > [$_{Spec\nu P}$ DP]	Selection: *v* v selects subject	→
P^{o} > DP[6]	Selection: P selects object	→

All the relationships in table (16) have something in common: informally speaking, it is the left-hand constituent that *does* something to the right-hand constituent: V, *v* and P all do the work of selecting an argument; iWH features on the WH-item do the work of checking uWH features on C^{o}; iφ on DP checks uφ features on T^{o}. Note that the relationship between the DP in SpecTP and T^{o} is more complex since the DP checks uφ features on T^{o} while simultaneously T^{o} checks uT features on DP and in addition DP checks an EPP 'feature'. This relationship, alone out of all the others in the table, is bidirectional. However, it can be factorized into two unidirectional dependencies, namely Case marking and φ checking. It is nevertheless the case that even for this complex agreement relationship, the left-hand constituent is actively doing work on the right-hand constituent.

The directionality of these relationships can be tested by examining the left-hand constituent – generally, in each case the nature of the right-hand constituent can be determined by examining the features of the left-hand constituent. But the inverse is not true. For instance, examining the features of P, V and *v*, it is possible to infer from their subcategorization features that they will select a DP. However, if one were to examine the features of a DP, it is not possible to infer which category (i.e. either V, *v* or P) they will be selected by. Thus, the DPs are determined by these heads. In the case of SpecTP, examining the iφ features on DP allow an inference about the final form of morphological agreement spelled out on T (e.g. 3sg.masc etc). However, if one were to only examine the uφ features of T, then one would not be able to determine what the corresponding features on DP would be once AGREE has taken place. Thus, as a rule of thumb, one can diagnose or infer the character of the

[6] Note that in table 16 the DP object of a preposition is usually assumed to be a complement. However, it is not clear why it could not be a specifier of P – by analogy with VP where the object of V is in Spec*v*P, when it is not a complement. Thus, PPs could, under certain theoretical assumptions be taken as evidence that the P head precedes its own specifier, just as V precedes its specifier.

dependent constituent simply from an inspection of the features of the determining constituent.

Seen in this way, a generalization emerges from the data of the preceding section. It seems to be the case that heads that determine an XP (whether as complement or specifier) precede those XPs and vice versa. For instance, those heads that c-select an XP (as virtually all heads do), or play a role in assigning (Case or theta) values to an XP, precede those XPs; whereas DPs that determine agreement (or some other uF) on heads precede those heads. In other words, that specifier-head and/or head-specifier orders follow from the 'direction' of the dependency between them.

This leads me to the proposal for a mapping to PF. There are probably many possible mappings, but the null hypothesis is that dependencies are mapped directly to linear ordering in a one-to-one and meaning preserving manner (17).[7] Note that (17) is preferable to (15) because it is more concise, requiring only one stipulation instead of two, and it refers to the underlying relationship that is instantiated by selection and agreement.

(17) PF output condition #2:

a. Let A and B be two syntactic objects (in this case, a head and its specifier)

b. Dependency pairs are mapped such at if A→B then A linearly precedes B

c. …as locally in linear order as possible.

What this means is that as a derivation proceeds, Merge, Move and Agree instantiate sets of functional dependencies (in other words, a phrase-structure graph). When a phase-head is merged, these sets of functional dependencies are transferred to the interfaces. In particular, it is a PF output condition that syntactic structures be linearized and this is what (17) achieves. For an interpretable/ uninterpretable feature pair, the category containing the interpretable feature will precede the category containing the uninterpretable feature (all things being equal it will be immediately adjacent in linear order). Thus, the WH-item (containing a iWH feature) will eventually precede the C head which contains a uWH feature. With

[7] It is an open question as to how linearization can be parameterized. According to Hauser et al. (2002), it may be that the only universal property of language is recursion. This leaves open the possibility that the interfaces, and SM/PF in particular, might lie outside the universal domain. Consequently, it is a (in my view dispreferred) possibility that languages may be parameterized according to which linearization algorithm they use e.g. some languages might utilize the LCA, others may utilize the system outlined in this paper. In my view, the more elegant solution is to have a single, universal linearization system yielding optimal outputs which are affected by language-specific variation in features.

respect to TP, since the interpretable φ features in DP determine the corresponding uninterpretable φ features on T, the DP will precede this head.

(18) a. DPφ →Tuφ (phi feature checking by AGREE)

b. DPWH→ CuWH (phi feature checking by AGREE)

However, for Case assignment the relationship is reversed. T, P and little *v* all assign case to DPs. Under the assumptions of Pesetsky and Torrego (2001), Nominative case is a reflex of uT on D. I assume, that similar features (e.g. such as Aspect) are complicit in the assignment of Accusative and Oblique cases (Svenonius 2002). In all Case assignment configurations, an interpretable T/Aspect feature on T, P or *v* values/checks a corresponding uninterpretable T/Aspect feature on the DP. By (17), this means that a case-assigning head will linearly precede a position in which the DP can be assigned case. Thus, T precedes the DP it assigns case to in existential constructions. Similarly, P precedes the DP it assigns case to and *v* precedes the DP object to which it assigns Accusative case.

(19) a. T → DP (Nom. Case checking by AGREE)

b. P → DP (Obl Case checking by AGREE)

c. v → DP (Acc. Case checking by AGREE)

d. V → DP (Selection of object)

e. v → DP (Selection of subject)

There are two main reasons to prefer (17) over the LCA. First, the generalization in (17) accounts for all the word orders explored in Section 3: it predicts that specifiers of CP and TP precede C and T respectively, while the heads V, *v* and P precede phrasal material. The LCA predicts uniform spec-head word order in English, and apparent exceptions to the LCA are treated as involving subsequent derivations which obscure the underlying order. Often, these derivations are parametrically stipulated. However, to the extent that (17) is correct the character of obscuring derivations can be questioned.

The second reason to prefer (17) is that it directly encodes an asymmetry between specifiers and complements. Recall that under the LCA, specifiers and complements are equally affected: specifiers rigidly precede heads, and complements rigidly follow them. However, this does not reflect the reality where specifiers appear to be much more variable in their ordering than complements. All things being equal, according to (17), all complements follow their selecting heads; specifiers, however, can either precede or follow their heads in principled and predictable ways, depending on their feature composition.

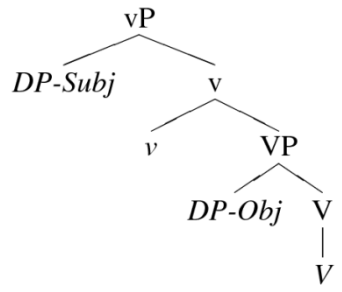
4. Short-head movement

The above-mentioned linearization proposal has the potential to remove the need for stipulative, short V-v raising. This is a welcome effect since V-v raising has curious properties that make it hard to explain other than as a stipulative mechanism for obtaining the right word order. An example of the paradoxical properties of V-v raising is the fact that it is obligatory in English – a language which otherwise has completely lost verb (V^o-T^o) movement; in contrast, V-v raising is obligatorily absent in Dutch, a language which has retained verb movement! (except, of course, in V2 contexts, when V-v raising is seemingly a precondition V^o-T^o-C^o movement); and in Mainland Scandinavian v-V raising is a precondition for v-T movement which also applies in embedded clauses. This suggests that whatever V-v raising is, it may not, actually be related to the verb-movement systems more generally. In addition, head-movement in general is a problem for Minimalist theories and there have been attempts to remove it from the system. Thus, any analysis that reduces the reliance on head movement in general, and V-v raising in particular is to be welcomed.

A typical derivation might proceed by merging V with a DP direct object, followed by merging of a phonetically null *v* to yield the following type of structure. Under traditional approaches, it was at this point that V-v raising applied.

(20)

a.



b. V→D(P)
c. *v*→V(P)
d. *v*→D(P)

In this structure, V selects a DP object and thus V→ DP-Obj; *v* selects a V(P) and thus *v* also selects the external argument and thus *v* →DP-Subj. At PF, these relations are linearized according to (17) yielding the correct word order with V preceding the DP object. Crucially there is no need to resort to V-v raising.[8]

[8] The system also works for double-object and expletive constructions if one assumes the broader normalization system outlined in De Vos (2008). A full discussion of normalization and its implications for double-object constructions is, regrettably however, beyond the scope of this paper. A fuller exploration of whether this system could replace verb movement more generally (e.g. V-T and V-T-C movement) awaits further research. Nevertheless, my preliminary calculations seem to show that if the V feature bundle contains features for Case, Agreement, Tense etc, then these will be sufficient to drive movement in these cases too.

5. Topicalization

In Section 3, it was argued that a Wh-item in SpecCP precedes the C head. This follows from the fact the uWH feature on C probes the iWH feature on the Wh-item. Thus, according to (17), the moved, WH-item should precede the C-head. The fact that the C head is phonetically null is simply a particular fact of English. This contrasts with topicalization contexts however, where the evidence for Spec-head word order is much less clear.

(21) a. Al Capone said that whatever happened he'd never be convicted [Adverbial/Parenthetical?]
b. #I said that John I like but Peter I don't [Topicalization]
c. *Al Capone said whatever happened that he'd never be convicted
d. *I said John that I like but Peter I don't

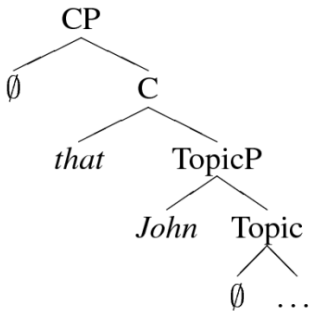
In (21a) a topicalized parenthetical follows the complementizer and in (21b), a syntactic object has been moved to a position following the complementizer. In both cases, it is impossible for the phrasal constituent to precede the complementizer (21c,d).

5.1. A double-layer and a single-layer proposal

Assuming an articulated CP layer (Rizzi 1997) in conjunction with the LCA, one arrives at the conclusion that WH-items and Topicalized XPs are hosted by different projections within CP as exemplified by the structure below.

(22) I said [$_{CP}$ [C^{0} that [$_{TopicP}$ John [Topic^{0} e [$_{TP}$ I [T^{0} [$_{vP}$ [$_{v}$ like…]]]]]]]]

(23) The Double-CP analysis

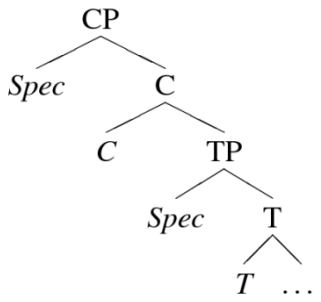


This double-layer analysis is forced by the requirement of the LCA that specifiers precede heads and not by the empirical facts which, as I will outline below, do not require such an analysis. Once the linearization requirement is stated in alternative terms such as (17), then a double-layer analysis is no longer strictly necessary, allowing a neater fit with the empirical facts as I will outline below.[9]

9 There are some troubling aspects to the structure in (22). First, CP and TopicP interact in curious ways: The specifier of CP is not overt while the head of TopicP is obligatorily present. The

While it is certainly a viable possibility to postulate an embedded TopicP[10], I would like to argue that it is, in fact, incorrect for English. The present linearization proposal opens the possibility, not present when one assumes the LCA, that SpecCP and SpecTopicP may actually be the same specifier position notwithstanding the fact that a WH item precedes C and a topicalized element follows it.

(24) The Single-CP analysis



(25) a. [$_{CP}$ iWH [$_{C^0}$ uWH . . .]] linearizes as WH > C^0

b. [$_{CP}$ uTopic [$_{C^0}$ iTopic . . .]] linearizes as C^0 > Topic

---

generalization seems to be that for any sentence, there can be a maximum of one CP-layer head and one CP-layer specifier which can be realized phonetically. The nature of this 'communication' between the specifier of one XP and the head of another remains mysterious. Second, this type of analysis requires that there be independent justification for why the head of TopicP is never lexicalized in English (this justification comes in the form of the Doubly-filled-comp filter, which is simply a stipulation). Furthermore, to the extent that this structure is generalizable to verb second (V2) languages (e.g. all Germanic languages except English), a problem arises for traditional accounts of V2 (Den Besten 1989). V2 languages are typically characterized by an asymmetry where the presence of an overt complementizer blocks movement of the verb, thus resulting in the verb remaining in situ – which is clause final in the Afrikaans examples below.

(i) Ek weet dat ek van Jan hou
I know that I of Jan like
'I know that I like Jan'

(ii) Ek weet (*dat) ek hou van Jan

This is because the absence of V2 in embedded contexts is crucially dependent on the complementizer *that* filling the only possible head to which a verb might move, thus precluding V2 in embedded clauses (9a). Since the analysis in (21) posits the presence of a further head below the complementizer, the traditional account is unworkable; a verb could always raise to Topic^0 thus giving rise to verb-second in embedded contexts.

(i) Ek weet [$_{CP}$ [$_{C^0}$ dat [$_{TP}$ ek [$_{T^0}$ [$_{AgrO}$ van Jan [$_{vP}$ [$_{v}$ hou…]]]]]]]

(ii) Ek weet [$_{CP}$ ek [$_{C^0}$ hou [$_{TP}$ [$_{T^0}$ [$_{AgrO}$ van Jan [$_{vP}$ [$_{v}$…]]]]]]]

[10] In fact, it is almost certainly correct for languages like Italian which (i) do not evidence blocking effects (Delfitto 2002:60) and (ii) allow multiple topics.

If SpecCP is filled by a constituent with a iWH feature and the head of C has checked uWH features, then a functional dependency is set up such at iWH→uWH. According to (17), the Specifier thus precedes the head (25a). However, if SpecCP is filled by a constituent with a uTopic feature, and the head of C contains an iTopic feature (cf. Delfitto's (2002) analysis of Italian),[11] then, according to (17), the specifier will follow the head (25b).

The double-layer and single-layer analyses in (23) and (24) respectively make distinct, testable predictions. Evidence that SpecCP and SpecTopicP are, in fact, one and the same position is that:

(i) In English, topicalization and WH movement have the same diagnostics (Chomsky 1977)

(ii) Movement to SpecCP blocks movement to SpecTopicP and vice versa

(iii) They both evidence that-trace effects

(iv) They both show doubly-filled-comp effects.

These will be discussed in the following sections.

5.1. Blocking effects

The double-CP structure in (22) has two specifier positions, one for WH items (SpecCP) and one for topicalized elements (SpecTopP) leading to a prediction that WH-extraction should be possible even in the presence of a topicalized element.

(26) a. I think that Peter you gave a book, but Sarah you gave a CD

b. What did you think that I gave Peter…

c. *What did you think that Peter I gave…

Example (26a) shows a topicalized DP following the complementizer. (26b) demonstrates that WH-extraction is possible in the absence of embedded topicalization, presumably using SpecCP as an escape hatch. Interestingly, (26c) is ungrammatical, suggesting that SpecCP is filled by the topicalized DP. The inverse also applies: it is not possible to do long-distance topicalization over an embedded WH item (27b).

(27) a. I wonder when I gave Peter that book?

b. *A book I wonder when I gave?

[11] Note that Delfitto (2002) seems to suggest that languages are parameterized according to whether a Topic feature is interpretable or uninterpretable on a DP.

The structure in (23) also predicts that topicalization and WH-movement should be possible within the same clause and again this is shown to be inconsistent with the facts (28b). The ungrammaticality of (28b) follows from a structure with only a single SpecCP.

(28) a. I wonder when I gave Peter that book?

b. *I wonder when Peter I gave that book?

The double-CP analysis derives the same facts with the additional assumption that Relativized Minimality blocks moving a WH-item across a topic. There are a number of concerns with this approach. First note that since this is an additional assumption, Occam's razor rules it out. Second, blocking effects are language specific (e.g. Spanish (Rivero 1978) and Italian (Delfitto 2002) do not have blocking effects) which suggests that the features responsible for the intervention effects are language specific; but Topic and Focus features are universal and rooted in semantics, so it is not easy to see how these could be made language specific. Third, it is not even clear why Topic and WH features should cause intervention effects since they have nothing in common: a WH item bears information focus whereas a topicalized element could have contrastive focus, or simply be a non-focussed topic. Furthermore, when a constituent in a sentence has a topic feature but has not moved (e.g. topichood is indicated by stress, or by pronominal status) then no intervention effect is caused (29a) indicating that it is not simply the presence of an intervening TOPIC feature which causes ungrammaticality. Furthermore, if one assumes that the Wh-word *why* can be base generated in CP without movement (Ko 2006, Rizzi 1991), then relativized minimality should, in principle, be by-passed leading to grammaticality. However the data does not bear this out: in (29b), a topic DP has moved to SpecTopicP, while *why* is base generated in SpecCP without having to cross over the embedded topic, but the result is still ungrammatical. These data strongly suggest that relativized minimality is not at play.[12]

(29) a. **A:** John came around to visit me last night.

B: Oh yeah? What did HE want?

b. *I wonder why John I like, but Peter I don't?

In contrast, assuming only a single SpecCP (24) predicts that WH-extraction should not be possible in the context of topicalization without additional speculation.

[12] Culicover (1996) cites evidence to show that blocking effects can be circumvented by various means including the use of stress. As Culicover (1996:458) notes, these exceptions are similar to those noted by Pesetsky (1987) where Relativized Minimality can be violated in WH contexts. Pesetsky's D-linking effects are not taken generally as evidence against Relativized Minimality. As such, Culicover's exceptions prove the rule and his arguments against the Double-CP model are, in spirit, similar to those made here.

5.2. Stacking

Under the standard assumption that SpecCP cannot be recursively 'stacked', the present proposal predicts that both multiple WH-movement (30b) and multiple topicalization (30c) are ungrammatical in English.

(30) a. I gave Peter a book and Sarah a CD

b. *Who what did I give and Sarah a CD

c. *Peter a book I gave, but I gave Sarah a CD

These data strongly support a view that SpecCP serves both as a location for WH-items as well as for topicalized DPs and that the double-CP analysis (23) does not fit the data without additional assumptions being made.[13]

5.3. That-trace effects

Another direct prediction of the single-CP approach is that both topicalization and WH-extraction should evidence that-trace effects since, both types of extraction pass through the same specifier position. In contrast, for a double-CP analysis, if C^0 and Topic^0 are truly distinct functional heads then it is not immediately clear why the that-trace filter should apply – unless one makes additional assumptions.

(31) a. Who did I say gave Peter a book

b. *Who did I say that gave Peter a book

The pair in (31) illustrate these well-known that-trace effects: an embedded subject can only be extracted in the absence of the complementizer. I do not have an explanation for this effect (but see Section 7); I am simply using it as a diagnostic here. Similarly, under long-distance topicalization, a that-trace effect is visible (32b).

(32) a. You, I said gave Peter a book

b. *You, I said that gave Peter a book

[13] Culicover (1996) argues that multiple topicalization in English is possible and shows evidence to this effect. However, I do not agree with several of his grammaticality judgements. Additionally, many of his examples require a special intonation; Pesetsky (1987) also noted the effects of intonation and D-Linking in evading WH-islands, but that is not to say that WH-islands do not exist. Moreover, he notes that multiple topicalization cannot apply to two NPs (i.e. arguments which cannot adjoin to IP) but seems to be limited to XPs such as PPs. He suggests that topicalized XPs "require identification" (p454). My interpretation of these facts is that this is consistent with (a) a single landing site for topicalization, from which an A-bar bound XP can be 'identified' through reconstruction to its trace and (b) the possiblility of adjunction of additional adverbial or PP material to IP (cf. Ernst 2002). This correctly rules out topicalization of multiple NPs, while allowing a single NP to be topicalized in combination with various adjuncts.

To complete the paradigm, when an object undergoes long-distance topicalization, the that-trace effect is not present (33a). This demonstrates that this effect is indeed a that-trace effect specific to subject extraction and is not simply a product of long-topicalization per se. These data are fully consistent with a single-CP analysis.

(33) a. John, I know that Sarah likes t, Peter, I'm not so sure about

b. *Sarah I know that likes John, Peter I'm not so sure about

Before continuing, there is evidence that could obviate the that-trace effects. For some examples and speakers, long topicalization of *any* constituent across an overt complementizer is degraded (34) (cf. Maki et al. (1999)). To the extent that these facts are true, the that-trace effect is actually not parallel to the situation with WH-extraction. While, these examples are quite clear, there are others which seem considerably less ungrammatical (35).

(34) a. Herself, Mary says (*that) she would never endanger (adapted from Culicover 1996:452)

b. Mary says that John, she doesn't know but (*that) she'd like to see drunk (Rochemont 1989 cited by Authier 1991)

(35) a. John, I know (?that) Sarah likes, but Bill I'm not so sure about

b. John, I think (?that) Sarah likes, but Bill I'm not so sure about

Additional empirical work is needed before there is consensus on the facts. Nevertheless, two generalizations can be made despite the variation. (i) The extraction of subjects is more marked than extraction of objects (36. To the extent that this contrast is valid, it constitutes evidence for a that-trace effect and should, ideally be explained. (ii) Additionally, long-topicalization of a non-subject is more marked than WH-extraction of a non-subject across an overt complementizer (37), an issue that will be discussed in Section 7.

(36) a. This book, I think (*that) impressed John

b. This book, I think (??that) you would like

(37) a. ??This book, Bill thinks that I like

b. Which book does Bill think that I like

6. Features and the doubly-filled-comp effect

The previous sections showed that there is ample evidence to suggest that there is only a single CP layer. But the assumption of the LCA makes a single-CP analysis simply untenable. Consequently, this type of analysis has been spurned for reasons of

linearization alone. However, once the linearization algorithm is adjusted (17), a single-CP analysis becomes possible. Central to the linearization algorithm, however, is the contention that Head-spec orders are not random or unconstrained, but are determined by the particular feature configurations under AGREE. This Section identifies the features in the English complementizer system and, in doing so, comes to a deeper understanding of the doubly-filled-comp effect: it will be shown that the doubly-filled-comp effect is an epiphenomenon of assumptions about linearization.

At first blush, both Wh-movement and topicalization evidence doubly-filled-comp effects (38). However, a complicating factor is that topicalization obligatorily requires the presence of a complementizer in C preceding the topic (39), suggesting that for topicalization, the doubly-filled-comp filter does not work in the same way as for Wh-movement. In fact, topicalization appears to require a doubly-filled-comp– just not in the same projection (if one assumes a double-CP analysis).[14]

(38) a. I wonder who Ø/*that John will invite?

b. I said that John Ø/*that, I would invite, but Bill I wouldn't

(39) a. I said *(that) John I would invite, but Bill I wouldn't

b. Julia thinks *(that) in all likelihood, David will invite Elizabeth (Delfitto 2002)

This problem is resolved under the single-CP analysis if one makes the following lexical stipulations and where either complementizer can be merged in any given derivation depending on the initial make up of the numeration.

(40) a. *that*, spelled out phonetically as /ðat/, is specified for iφ (cf. Van Craenenbroeck and Van Koppen 2002) and iTopic features (cf. Delfitto (2002) for Italian) and

b. *THAT*, spelled out as phonetically null, is specified for uWH (and perhaps uφ) features.

c. These features may vary parametrically.

[14] I will put aside the vexing question of how movement to an embedded SpecTopicP is conditioned by a PF requirement, namely that the head of C (which has not been merged when the topic moves) must be spelled out overtly, since this issue does not arise in the single-CP analysis.

6.1. Deriving a WH-construction

In order to derive an embedded Wh-construction, it is necessary to have phonetically null, THAT in the numeration or the derivation will ultimately crash. The derivation proceeds normally until C is merged (41a).[15] The Wh-item moves to SpecCP and checks its uWH feature against that of C (41b). This AGREE operation instantiates a functional dependency such that *Who* > THAT. According to (17), the WH-item is spelled out preceding the complementizer, which just so happens to be spelled out as phonetically null (41c).

(41) a. [$_{C^o}$ THAT(uWH) [$_{TP}$ I [$_{T^o}$ will [$_{vP}$ invite [$_{VP}$ who(iWH)]]]]]

b. [$_{CP}$ who~~(iWH)~~[$_{C^o}$ THAT(~~uWH~~) [$_{TP}$ I [$_{T^o}$ will [$_{vP}$ invite [$_{VP}$ t]]]]]]

c. Spelled out as: I wonder who ; I will invite

6.2. Deriving a Topicalization construction

The derivation of an embedded topicalization construction requires the complementizer *that* in the numeration or the derivation will crash. The derivation proceeds normally until C is merged (42a). The DP bearing an uninterpretable Topic feature moves to SpecCP and checks its features against those of the complementizer by means of AGREE(42b). This operation instantiates a functional dependency such that *that* > *John* and is spelled out in that order (42c).

(42) a. [$_{C^o}$ that(iTop) [$_{TP}$ I [$_{T^o}$ would [$_{vP}$ invite [$_{VP}$ John(uTop)]]]]]

b. [$_{CP}$ John(~~uTop~~) [$_{C^o}$ that(~~iTop~~) [$_{TP}$ I [$_{T^o}$ would [$_{vP}$ invite [$_{VP}$ t]]]]]]

c. Spelled out as: I said that John I would invite . . .

Thus, the doubly-filled-comp effect reduces to a particular lexical fact about English, namely that one particular complementizer happens to be spelled out as phonetically null. That topicalization structures appear to have a doubly-filled-comp effect is epiphenomenal; the complementizer is indeed filled by an overt complementizer *that*, but due to its feature specification, it precedes the specifier. This analysis also captures the fact that the complementizer is obligatory in topicalization contexts.

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[15] There are additional steps in the derivation involving movement to phases etc. These steps have been omitted in the interests of simple exemplification. Their inclusion or exclusion does not affect the analysis.

7. Speculations on that-trace effects

The proposed analysis also provides some interesting insights about that-trace effects. In (40) it was proposed that *that* is specified at iTopic, that is, topichood, if present in a clause, is interpretable on this particular complementizer. The linearization algorithm (17) ensures that *that* will precede a constituent bearing uTopic features. From this, it is a short step to suppose that the complementizer *that* may mark its immediate *complement* (in the instance of its specifier being empty) as being a topic. In other words, there is a field immediately following the complementizer that is filled by a discourse topic.[16] Taking this for granted for the moment, allows an explanation of the that-trace effect.

An overt complementizer, *that* will mark the subject in the field immediately following it as being a topic. Extraction of a focussed, WH-item from a non-subject position is consequently unproblematic (43a). WH-movement uses the specifier of the complementizer as an escape hatch in a purely utilitarian fashion, but there is no feature-agreement relationship established between the complementizer *that* and the WH-item which passes through its specifier. Extraction of a subject in the presence of an overt *that* is blocked because the subject is a focussed WH-item which is inherently unable to be topic-marked by *that* (43b).

(43) a. Which book did you say …

that you would enjoy ~~which book~~?
TOPIC FOCUS

b. *Which book did you say…

that ~~which book~~ was expensive
TOPIC/FOCUS

Long extraction of a topicalized subject in the presence of an overt *that* is also blocked on the reasonable assumption that long-topicalization requires a uTopic feature on the DP. The overt complementizer checks its iTopic feature against the uTopic feature of the subject in embedded position and the features of both become inactive(44a). When the matrix clause probes for a topic, there are no longer any active uTopic features available in the structure. Consequently, long-topicalization from the subject position is not possible 44b). However, if a null complementizer is merged, then uTopic is not checked in embedded position and extraction is licensed (45).

[16] Note that in terms of the analysis proposed in this paper, a complement and specifier are structurally distinguished, but that in terms of linear order, both the complement and the specifier of a *that* head would follow the head, making them superficially indistinguishable and thus presumably open to reanalysis during language acquisition.

(44) a. that this book was expensive [Step 1]
iTopic uTopic

b. *This book I think that ~~this book~~ was expensive [Step 2]
TOPIC

(45) a. Ø this book was expensive [Step 1]
uTopic

b. *This book* I think Ø ~~this book~~ was expensive [Step 2]
TOPIC

With regard to long topicalization of a non-subject across an overt complementizer there appears to be speaker variation (Maki et al. 1999) as noted in Section 5.1.3. Although additional empirical work is needed before there is consensus on the facts, the contrast between extraction of WH-non-subjects and non-subject topics across an overt complementizer seems clear: extraction of topics is more marked than extraction of WH-items (37). This should, ideally be explained.

Topicalization requires that a DP with a uTopic feature be merged. The complementizer *that* would probe its complement for uTopic features, prompting movement to the embedded SpecCP. After AGREE the features would be inactive and the topicalized constituent would be unable to move into the matrix clause. In other words, the derivation parallels that in (44) and topicalization of any constituent across an overt complementizer is predicted to be ungrammatical.[17]

This line of reasoning makes a prediction that if a constituent is adjoined to IP, it will be check iTopic feature on *that*, leaving SpecCP open as an escape hatch for

[17] Note that this derivation is the one most in-line with standard assumptions. It also straightforwardly accounts for the contrast in (37). The second, disprefered, derivation below requires additional assumptions being made about EPP on C and pragmatics. I include it merely as an option of possibly accounting for variation in the data.

One line of argument might proceed as follows. There are arguably at least three ways of indicating topichood: (a) grammatically, by means of a uTopic feature checked by AGREE, (b) prosodically, by means of stress placement and (c) pragmatically, by fronting, drawing on the well-known typological fact that topics tend to precede focii cross-linguistically. It may be the case that some speakers/dialects draw more on one strategy than others i.e. that these strategies are subject to parametric variation.

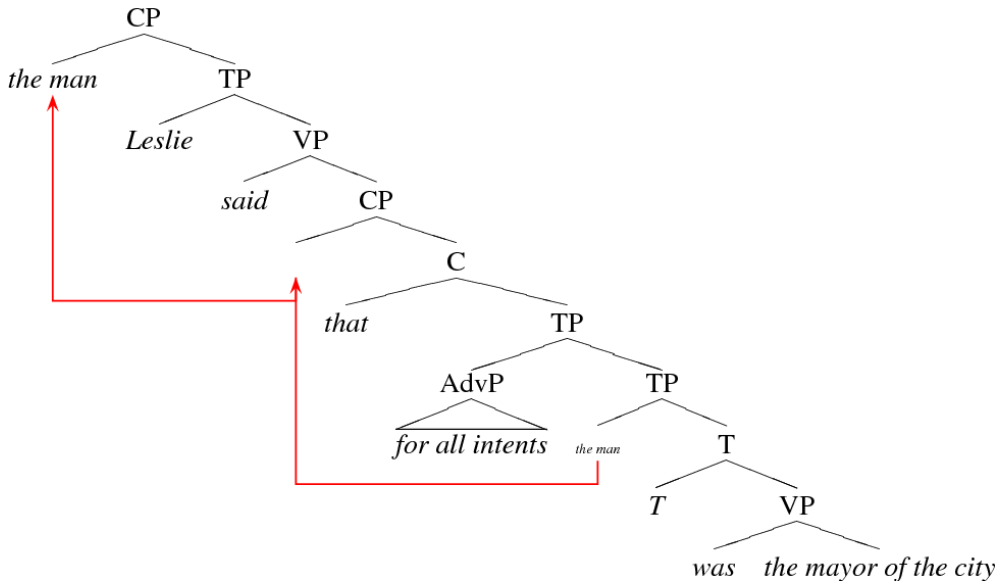
For speakers utilizing a prosodic strategy, the derivation might conceivably converge. Consider a derivation where a constituent is prosodically annotated for topichood but otherwise lacks a uTopic feature. For concreteness, it can be assumed, that a DP moves to the matrix SpecCP to satisfy an EPP requirement but does not otherwise check any features: merging *that* with an iTopic feature would have no effect since the DP has no corresponding uTopic features. Moreover, embedded SpecCP is available as an escape hatch. The DP could move via SpecCP, establishing no relationship with the head of SpecCP, into the matrix clause. At PF the moved DP is prosodically marked and that at LF, the moved DP is given an interpretation corresponding to topichood.

subsequent extraction (47). In other words, adjunction of an XP to IP will void that that-trace effect. This is what happens with the so-called *adverb effect*.

(46) a. Who did Leslie say that, for all intents and purposes, t was the mayor of the city?

b. Robin met the man Leslie said that, for all intents and purposes, t was the mayor of the city (Delfitto 2002:57 citing Browning (1996))

(47)



8. Conclusion

This paper began with an empirical aim, namely to provide evidence that specifiers precede their heads in English. It was demonstrated that this evidence is largely lacking or inconclusive. Nevertheless, the patterns between English specifiers and their heads are highly revealing: they follow from directional dependencies once these dependencies are mapped to linear order. Furthermore, the resulting system allows for simplification of the vP and CP systems. On the question of parameterization, the nature of the explanation which posits a linearization principle applying at the PF interface, suggests that something like (17) could be universal. Whether this is indeed the case, or whether (17) and the LCA are parametric options (given that both are arguably equally 'primitive') remains a question for further study. Certainly, while these results, in no way, detract from the general validity of the LCA, they do raise the ultimate prospect of either doing away with it or perhaps parameterizing the LCA as a linearization algorithm. Needless to say they also open a wide range of empirical and theoretical questions which this paper has no hope of being able to cover; just as the LCA, when it was first published, seemed to contradict established facts e.g. the head-final status of Dutch – it took subsequent research to

establish a head-intial syntax for Dutch (Zwart 1994). Consequently, to paraphrase Niels Bohr, I think we can all agree that the proposal in this paper is crazy. The question which divides us is whether it is crazy enough to have a chance of being correct. My own feeling is that it is not crazy enough.

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