

# The Phase Theoretic Basis for Subject-Aux Inversion

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## Abstract

It is shown that the major properties and distribution of subject-aux inversion in English can be derived from a phase theoretic interpretation of Rizzi's exploded CPs in which FinP is a strong phase. The analysis extends naturally to Germanic verb-second structures in general.

## 1 Introduction

The data in (1)–(2) will be familiar to everyone.

- (1) a. Who pitched the tent?  
b. \*Who did pitch the tent?
- (2) a. \*Which tent Sheila pitched?  
b. Which tent did Sheila pitch?  
c. \*Where Sheila pitched the tent?  
d. Where did Sheila pitch the tent?  
e. \*When Sheila pitched the tent?  
f. When did Sheila pitch the tent?

Taking *do*-support as indicative of movement of T to C, what the data in (1)–(2) appear to show is that T raises to C when a non-subject undergoes root wh-movement, but not when a subject undergoes root wh-movement. There are two related issues raised by this data: first, why does T-to-C movement take place in root wh-questions at all, and secondly, why are subject wh-questions like (1-a) exempt from this movement?

The data in (3) raises a separate set of questions.

- (3) a. We asked who pitched the tent?  
b. \*We asked who did pitch the tent?
- (4) a. They inquired which tent Sheila pitched.  
b. \*They inquired which tent did Sheila pitch.

- c. Everyone was curious where Sheila pitched the tent.
- d. \*Everyone was curious where did Sheila pitch the tent.
- e. Don't ask when Sheila pitched the tent.
- f. \*Don't ask when did Sheila pitch the tent.

In embedded questions, T-to-C movement does not take place at all, so subjects and non-subjects pattern alike. The question raised by this data is why root and embedded questions are different in this respect.

In this paper, I show that answers to both sets of questions can be found by carefully examining some of the consequences of the theory of phases proposed in Chomsky (2001, 2004), and by integrating some of Rizzi's (1997) proposals on the fine structure of CP into phase theory.

My claims will be the following:

- (5) a. Root clauses are not fully audible, because phase theory blocks Spell-Out of root C.
- b. FinP is the Spell-Out unit in root clauses.
- c. Wh-movement targetting Spec-CP is possible only in embedded clauses.
- d. Root clauses allow (partial) wh-movement by displacing the subject from Spec-FinP to allow wh-phrases to raise to this position.
- e. T raising occurs when the subject cannot raise to Spec-FinP.

With the peculiar "residual" verb-second character of English root questions explained, the way will be clear to extend these ideas to Germanic verb-second structures in general, a project with which I conclude the paper.

## 2 Deferred phase Spell-Out

At some point in the derivation of any linguistic expression, the hierarchical ordering of phrases must give rise, via a Spell-Out operation, to a linear ordering of phonetic units. Chomsky's (2001) proposal is that Spell-Out affects (strong) phases, the units of structure which are derived on the basis of individual numerations. Although the full set of phase categories is not yet clear, at least CP and transitive vPs must count as phases. Crucially, however, TP is not a phase. In a complex sentence like (6), then, Spell-Out will not apply to the string *the rain would fall in Spain*; only to the larger string *that the rain would fall in Spain*.

- (6) Higgins insisted [<sub>CP</sub> that [<sub>TP</sub> the rain would fall in Spain ]]

The identification of the CP phase as a constituent which is subject to Spell-Out is complicated by the fact that A-bar movement can extract material from CP into a higher clause, as occurs in successive cyclic wh-movement, for example. Such movement forms a chain in which only the head is normally pronounced. The problem can be seen immediately in (7).

- (7) *What* did they claim [<sub>CP</sub> ~~*what*~~ that [<sub>TP</sub> Claire had repaired ~~*what*~~ ]]

The *wh*-phrase *what* raises from its base object position to become the specifier for CP in the complement clause. If Spell-Out of the entire CP phase were to take place at this point, *what* would be pronounced at the left edge of the complement clause, rather than in its final position. In general, in fact, the idea that phases are subject to Spell-Out implies that movement will be possible only inside a phase, and that no successive cyclic movement should occur.

Chomsky's solution to this problem is simple, and persuasive. He proposes that Spell-Out of a phase is deferred until the point in the derivation at which it can be determined whether anything will be extracted from the phase in question. Since extraction typically raises material to the edge of the next higher phase, this means that Spell-Out of any one phase will take place when the derivation of the next higher phase is completed. Chomsky's formulation is (8).

(8) ... where PH<sub>1</sub> is strong and PH<sub>2</sub> is the next highest strong phase:

(10) Interpretation/evaluation for PH<sub>1</sub> is at PH<sub>2</sub>.

In (7), for example, *what* will be Merged into the specifier position of the root clause vP phase in order to eventually reach its final position in the root CP. At the point where Spell-Out of the complement clause takes place, the structure will be (9).

(9) [<sub>VP</sub> *what* [<sub>V'</sub> they claim [<sub>CP</sub> ~~*what*~~ that [<sub>TP</sub> Claire had repaired ~~*what*~~ ]]]]

With this much structure in place, the *what* trace in Spec-C of the complement clause can be identified as something other than the head of its A-bar chain, so that it will not be pronounced.

Chomsky's characterisation of how phases are interpreted carries its own set of consequences. One consequence in particular is pertinent to the questions which concern me here, and to the distinction between root and embedded clauses. TP is not a phase, under Chomsky's formulation. In fact, TP cannot be counted as a phase unless the very basis for the distinction between phases and other categories is thrown out. As phases are the unit of structure which are subject to Spell-Out, TP cannot be subject to Spell-Out. But root clauses are certainly Spelled-Out, since they are actually said. The only conclusion which can be drawn is that root clauses are not TP categories—they must be something larger, something which contains a TP category, but which is itself a phase. Let us adopt Rizzi's (1997) notion of a Finite Phrase (FinP) to refer to the phase which undergoes Spell-Out in a root clause.<sup>1</sup>

The use which I will make of Rizzi's proposed structures is quite limited. I will adopt his general claim that the left periphery includes several heads, such as C (Rizzi's Force), Fin, Top and Foc. And I suppose that Top and Foc are located between C and Fin, in some order. But I do not assume that Top and Foc are present in every sentence, following the reasoning of Holmberg and Platzack (2003). And I will not make use of the still richer structures advanced by Rizzi in more recent work, e.g. Rizzi (2004).

Under these assumptions, a simple declarative clause must minimally have the structure in (10).

<sup>1</sup>The label adopted here is primarily a matter of notational convenience. Other labels which seem to identify the same position in a sentence include  $\Pi P$  (Branigan, 1992, 2004),  $PolP$  (Culicover, 1991) and  $AgrcP$  (Shlonsky, 1994), as well as  $Agr_s$  (Belletti, 1990; Chomsky, 1993), under some interpretations.

(10) [CP C [FinP ... Clauses are pretty big ]]

Fin presumably takes a TP complement, and TP will contain much of the content of the clause. C selects FinP, and presumably checks some substantive feature on the Fin head. For convenience, let us refer to the Fin feature checked by C as [finite]; nothing in particular hinges on the content of this feature, however. FinP is phasal, and therefore subject to Spell-Out, but only when the clause structure has been built up to the CP phase level. And the root C in (10) will never be subject to Spell-Out, so root C must always be silent.

### 3 The impossibility of root wh-movement

Since Spell-Out in root clauses can apply only to FinP and not to root C, it follows that the wh-phrase which appears at the left edge of a simple wh-question cannot be in the Spec-C position. In other words, the structure of (11-a) is not the conventional (11-b) but rather (11-c).

- (11) a. When should we meet?  
 b. [CP when should [TP we *e* meet *t* ]]  
 c. [CP C [FinP ... when should we *e* meet *t* ]]

If *when* in (11-a) had raised to Spec-CP, it would be outside the last phase that Spell-Out can apply to, and the derivation would necessarily crash because the phonetic content of *when* would receive no PF interpretation. (And the same would be true of *should*, if *should* were to raise up to root C.)

In embedded clauses, however, where C is always subject to Spell-Out, there is no reason why the conventional story about wh-movement should be wrong. Then (12) will have the structure indicated.

- (12) Shelley wondered [CP when C [FinP they would meet ]]

That this is the right structure for embedded questions is evident from languages where both overt complementisers and wh-phrases may appear. (German and Dutch allow violations of the ‘doubly-filled Comp filter’.) (Examples are taken from Müller (1995) and Zwart (1992), respectively.)

- (13) a. Ich weiß nicht wen daß sie geküßt hat  
           *I know not whom that she kissed has*  
 b. Ik weet niet wie ofdat Marie gekust heeft.  
           *I know not who if-that Marie kissed has*

The wh-phrase always precedes the complementiser, so the most likely position of the wh-phrase is Spec-CP.

I will defer the question of actual position of root wh-phrases until section 3. At this point, I want to confine the focus of discussion on the evidence for, and the consequences of, a lack of true wh-movement in root clauses.

One consequence is that we should expect to find differences between root questions and embedded questions which follow from the different positions of *wh*-phrases. Within the Germanic language family, where the syntax of *wh*-questions is fairly similar, we do find such differences. One case comes from Yiddish. In Yiddish, and marginally in English, a *wh*-phrase in an embedded question can co-occur with a preposed topic or focus (Diesing, 1990; Baltin, 1982; Rochemont, 1989).

- (14) a. Zi is gekumen zen ver frier vet kontshen. (Diesing, 1990)  
           *she is come to-see who earlier would finish*  
       b. the fellow to whom never had I written any letters

The *wh*-phrase here appears in the specifier of the complement CP (headed by an interrogative C), and the topic appears after it. Since the two preposed phrases evidently occupy different positions in these structures, the null hypothesis is that they also occupy different positions in simpler clauses, as well. If the *wh*-phrase is in Spec-CP, then the preposed topic must occupy a specifier position within a lower phrase, plausibly in FinP.

The happy coexistence of a *wh*-phrase and a topic in a stacked series of CPs is impossible in matrix clause (Diesing, 1990).

- (15) a. ... vi ikh veys vos bay mir tut zikh (from Moorcroft (1995))  
           *as I know what by me does itself*  
           ‘... as I know what goes on with me’  
       b. \*Ver haynt hot gegesn dos broyt?  
           *who today has eaten the bread*  
       c. \*Vos hot dem rov Max gegeben?  
           *what has to the rabbi Max given*

The ungrammaticality of (15-b) is to be expected if *wh*-movement in root clauses targets a position where it competes with the topic, a position other than Spec-CP. Yiddish, like other Germanic languages, does not allow multiple topics for a single clause. The root/embedded clause contrast remains mysterious, however, if we insist that root questions involve movement of the *wh*-phrase to Spec-CP.

The Yiddish pattern can be replicated in English, where monotone decreasing topics can also co-occur with *wh*-phrases in embedded questions.

- (16) a. It was with Mary at the helm that at no time was I concerned about my safety, not  
           with John.  
       b. ?The chief would like to know with whom at the helm at no time were you concerned  
           about your safety.  
       c. \*With whom at the helm at no time were you concerned about your health?

Another type of evidence for distinct landing sites for *wh*-phrases in root clauses comes from a peculiar German constraint on successive cyclic movement. In German, cross-clausal movement

of a topic is possible in very specific circumstances, as in (17).

- (17) In zwei wochen<sub>i</sub> glaubt Anna, [ *t<sub>i</sub>* hat Max gesagt, [ *t<sub>i</sub>* werde sie *t<sub>i</sub>* kommen. ] ]  
*in two weeks believes Anna has Max said will she come*

Topic movement from one clause up into a higher one is subject to a special constraint: it is forbidden to use an intermediate specifier of a non-verb-second CP as an escape hatch in successive cyclic movement. The effects are seen in (18).

- (18) \*Anke<sub>i</sub> sagte sie [<sub>CP</sub> *e<sub>i</sub>* daß er glaube [ *t<sub>i</sub>* werde ihm seine Arbeit hier bezahlen.  
*Anke said she that he believes will him his work here pay*

It is not important for now what the relevant difference between the verb-second and the non-verb-second clauses. What matters is to recognize that there is a movement constraint which is sensitive to whether a topic travels *via* Spec-CP with a complementiser in C.

So the general pattern is that successive cyclic movement permitting long topicalisation may raise a topic from Spec-CP to the left edge of a higher verb-second clause, but the reverse is not true. And the same pattern can be identified in some cases of long wh-movement in questions. Thus in (19), the wh-phrase *wann* raises from the edge of a verb-second of the complement clause into the matrix clause. In this respect, the landing site for root wh-movement is like that used in topicalisation.

- (19) Wann hat Fritz gesagt, *t* werde sie kommen?  
*when has Fritz said will she come*  
 ‘When did Fritz say she would come?’

And movement of wh-phrases from a verb-second clause is subject to the same constraint as long topicalisation.

- (20) \*Wer<sub>i</sub> sagte sie, daß er glaube, *t<sub>i</sub>* werde ihm seine Arbeit hier bezahlen?  
*who said she that he believes will him his work here pay*

In embedded questions, however, interrogative C behaves like a declarative *daß* complementiser as far as long movement from a verb-second clause is concerned. Successive cyclic wh-movement is possible in embedded clauses, but movement from a verb-second clause to a higher embedded interrogative Spec-C is impossible.

- (21) \*Anna fragte mich, wann<sub>i</sub> ihnen Fritz gesagt hat, *t<sub>i</sub>* werde sie *t<sub>i</sub>* kommen.  
*Anna asked me when you Fritz said has will she come*

Thus embedded interrogative C patterns with declarative *daß* and root interrogatives do not.

The simplest account for these data will need to start from the premise that the landing site of both phrases is the same position, a position which is then distinct from the one used by wh-phrases in embedded questions.

The constraint is not restricted to German. In Belfast English, inversion is always possible in embedded yes-no questions. As Henry (1995) shows, inversion in such questions is allowed only if there is no overt complementiser, indicating that the verb raises to the argumental C.

(22) We couldn't establish did he meet them.

'We couldn't establish whether he met them.

Inversion is possible with embedded wh-questions for some, but not all speakers of this dialect. (The examples which follow are all taken from Henry (1995).)

(23) He didn't say why had they come.

In addition, and most clearly in contrast with other dialects of English, inversion can be triggered by successive cyclic wh-movement, in a manner reminiscent of long wh-movement in German. And the long topicalisation in this dialect is subject to the same constraint as long topicalisation in German, as shown by ((24-c)) (Alison Henry, personal communication).

- (24) a. What did John hope would he see?  
 b. Who did John say did Mary claim had John feared would Bill attack?  
 c. \*Who did John say did Mary claim that John feared would Bill attack?

The movement constraint in German and Belfast English shows the same thing that the Yiddish data shows: that wh-movement in root questions does not raise the wh-phrase to Spec-CP. Instead, root questions have wh-phrases in a lower position at the left edge of the clause.

## 4 FinP and the Phase Impenetrability Condition

The evidence from section 3 shows that "wh-movement" is not a homogenous operation. Instead, there are at least two distinct operations involved in forming wh-questions in different positions. Wh-movement in embedded questions raises a wh-phrase to Spec-CP, presumably to allow the [wh] and EPP features of interrogative C to be checked. Wh-movement in root questions takes place without raising the wh-phrase out of FinP.

What now can be said about the FinP-internal movement in root wh-questions? Although wh-phrases do not raise to Spec-CP in root questions, they still raise to the leftmost position in the visible portion of the clause (FinP). The likely target position for this movement is Spec-FinP, a position higher than Spec-TP, where the subject appears to reside, as in (25):

(25) [<sub>CP</sub> C [<sub>FinP</sub> which tent [<sub>Fin'</sub> ... did Sheila *e* pitch *t* ]]]

Although the root complementiser is not subject to Spell-Out, the null hypothesis is that otherwise it has the same properties as the interrogative complementiser in embedded

An EPP feature on a root C may seem paradoxical at first, but there is no reason to suppose that the paradox is real. The function of EPP features is to drive movement, generally in combination with checking of some other more substantive feature, and movement feeds the Spell-Out operation. It is plausible that the EPP feature should be understood as a property of a head which is to be satisfied before Spell-Out occurs, and that EPP features are otherwise unproblematic in the derivation. In other words, let us suppose that EPP features only need to be checked on a head which is subject to Spell-Out. It follows that root interrogative C may bear the same EPP feature as embedded interrogative C bears, even though only the latter acquires a specifier *via* wh-movement.

At this point however, the *Phase Impenetrability Condition* becomes relevant. If FinP is a phase, then all but its head and its specifier will be inaccessible to any head outside FinP, including root C. Given a structure like (26), for example, the root C will not be able to check its [wh] feature.

- But if Fin bears the right sort of probe feature, together with an EPP feature, then it may attract the *wh*-phrase to Spec-FinP, where it will be accessible for checking the [wh] feature of the root C. It follows that Fin must have such properties in root *wh*-questions, and that this is what accounts for the left-edge position of the *wh*-phrase.

- The *wh*-phrase is not directly attracted by root C; it is attracted by *Fin* in order to be accessible to root C.

I propose that the specific feature which attracts the wh-phrase in FinP is not the [wh] feature which appears on C, but rather a distinct probe feature which is provided only to Fin. This feature attracts only *monotone decreasing* focal operators, a set of grammatical objects which includes



both wh-operators and other negative polarity elements.<sup>2</sup> I will defer justifying this choice of features until section 6. For now, let us simply indicate the presence of such a feature with the label [MD]. The derivation of (28) will then proceed as illustrated in (29). (I ignore the position of the auxiliary verb in the derivation for now; I also set aside the processes by which material in vP escapes from the vP phase.)

(28) Which truck had they rented?

- (29) a.  $[\text{FinP Fin } [\text{TP they had rented which truck } ]]$  (*FinP constructed*)
- b.  $[\text{FinP Fin } [\text{TP they had rented } \begin{smallmatrix} [MD] \\ wh \end{smallmatrix} \text{ which truck } ]]$  (*[MD] added to head*)
- c.  $[\text{FinP } \begin{smallmatrix} [MD] \\ \end{smallmatrix} \text{ which truck Fin } [\text{TP they had rented } t ]]$  (*movement and checking*)
- d.  $[\text{CP C } \begin{smallmatrix} [MD] \\ wh \end{smallmatrix} [\text{FinP which truck had they } e \text{ rented } t ]]$  (*CP constructed*)
- e.  $[\text{CP C } \begin{smallmatrix} wh \\ \end{smallmatrix} [\text{FinP } \begin{smallmatrix} [MD] \\ wh \end{smallmatrix} \text{ which truck had they } e \text{ rented } t ]]$  (*[wh] checked, FinP Spell-Out*)

In embedded questions, where wh-phrases raise all the way to Spec-CP, similar locality issues must arise around the FinP phase, but the grammar appears to make use of a different mechanism to resolve the problem, an adjunction site escape hatch, an option explored extensively in Chomsky (1986) and Lasnik and Saito (1992).

Consider example (30):

(30) Beth asked  $[\text{CP which truck C } [\text{FinP they had rented } ]]$  ?

As in the root question (28), the wh-phrase cannot be checked by C directly inside the FinP complement under the *Phase Impenetrability Condition*. Some intermediate movement of the wh-phrase to an accessible position must take place first. In embedded clauses, though, there is an escape hatch available which does not exist in root clauses. The word order in (31) indicates that FinP may be a legitimate phrasal adjunction site.<sup>3</sup>

- (31) a. Brian explained that on Thursday the plane had been late.  
b. I should tell you that beer, I really like.

And in that case, there is nothing to prevent a wh-phrase from adjoining to FinP, too. As adjunction to the left edge of FinP leaves a wh-phrase accessible to C under the *Phase*

<sup>2</sup>Inasmuch as its probe features are connected to the notion of negative polarity, Culicover's (1991) Pol head, or Laka's (1990)  $\Sigma$ , would be plausible alternative labels for the Fin head. As shown in section 5, however, the Fin head has different content in other contexts, so a more neutral label is more accurate.

<sup>3</sup>Of course, the data in (i) is also consistent with a TP adjunction site, but this possibility will be excluded as we proceed through section 5.

*Impenetrability Condition*, wh-movement in (30) may take place without using the Spec-FinP escape hatch.<sup>4</sup> A fuller picture of (30) will then be (32).

(32) Beth asked [<sub>CP</sub> which truck C [<sub>FinP</sub> *t* [<sub>FinP</sub> they had rented *t* ]]] ?

As for why the embedded clause escape hatch strategy is not used in root clauses, and *vice versa*, read on.

## 5 Subject-aux inversion and the content of Fin

We are now in a position to return to the problem of subject-aux inversion. Consider again the data in (1)-(2).

- (1) a. Who pitched the tent?  
b. \*Who did pitch the tent?
- (2) a. \*Which tent Sheila pitched?  
b. Which tent did Sheila pitch?  
c. \*Where Sheila pitched the tent?  
d. Where did Sheila pitch the tent?  
e. \*When Sheila pitched the tent?  
f. When did Sheila pitch the tent?

We understand now that in the grammatical examples of (1)-(2), the wh-phrase occupies the Spec-FinP position, in which it is accessible for checking by root C. The auxiliary verbs in (32-b,d,f) raise out of TP to a position below the wh-phrase, which must now be taken to be the Fin head position. The question of subject-aux inversion can now be rephrased as a question about movement of T to Fin, and not of T to C.

So why should T raise to Fin in (32-b), but not in (31-a)? And why does T not raise to Fin in simple declaratives like (33)?

(33) Gabrielle had pitched the tent.

The recent work of Pesetsky and Torrego (2000) comes very close to providing what I take to be the right answer. They propose that C carries a particular feature (their [Tense]) which must be checked by attracting either T or a wh-phrase subject up to C. Translated into my model, the idea would be that *Fin* carries some feature which must be checked on a subject DP or T. Since my

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<sup>4</sup>The existence of two distinct types of phase escape hatches is necessary in any case, given the French participle agreement facts unearthed by Obenauer (1990). Obenauer shows that participle agreement—which I assume to be reflective of movement of the object to Spec-vP—takes place only when the object is definite. Indefinite wh-phrases do not trigger past participle agreement. This suggests that definite wh-phrase objects escape when a “definiteness” feature is added to *v* to attract them to Spec-vP, while other wh-phrases, including indefinite objects, must adjoin to vP to escape instead.

conception of the role of T in Case relations differs from theirs,<sup>5</sup> I will not borrow Pesetsky and Torrego's idea that [Tense] is the feature which drives subject-aux inversion.<sup>6</sup> Instead, I suppose the Fin simply bears agreement features which must be valued by checking the closest  $\phi$ -valued target.<sup>7</sup> As in Pesetsky and Torrego's account, I maintain that Fin bears an EPP feature which will be satisfied by raising the target of checking.

Consider the derivation of (1) under this approach. When Fin is merged into the derivation with TP, it bears unvalued  $\phi$  features and an EPP feature. In order to value its  $\phi$  features, Fin checks the subject DP *who* and raises it to Spec-FinP at the same time. As a result of this operation, *who* is accessible to the root C when it is merged into the structure. Root C can therefore check its [wh] feature with *who* and the derivation is convergent.

The derivation of (33) will be quite similar. Although there is no wh-phrase in this sentence, and C will therefore not need to check the specifier of FinP, the features of Fin will be the same as in the preceding derivation. Fin bears  $\phi$  and EPP features, and must therefore check the subject *Gabrielle* and attract it to Spec-FinP. Subsequent merge of root C into the phrase marker will then allow FinP to be Spelled-Out.<sup>8</sup>

In the subject-aux inversion sentences (2), the derivation is more complex, because the presence of  $\phi$  and EPP features in Fin is not sufficient to supply a convergent derivation in these cases. As discussed in section 5, the wh-phrase can only be attracted to the Spec-FinP position in these structures by supplying an extra [MD] feature to Fin. Consider the derivation of (2)[b] in this light. (I here ignore the movement of the object out of the vP phase once again.)

$$(34) \quad [\text{FinP Fin } [\text{TP Sheila T pitch which tent } ]]$$

$$\begin{array}{ccc} \left[ \begin{array}{c} \phi \\ \text{EPP} \end{array} \right] & [\phi] & [\phi] \end{array} \quad \left[ \begin{array}{c} \text{MD} \\ \text{wh} \end{array} \right]$$

Given the featural content of Fin in (34), Fin will simply attract the subject *Sheila* to Spec-FinP if nothing changes in the derivation. But then root C would have no access to the [wh] feature of *which* and the derivation would fail. To rescue the derivation, therefore, a [MD] feature is added to the head of FinP. Bobaljik and Branigan (2004) show that the order of checking operations is rule-governed in cases where multiple checking features are supplied to a single head: the feature which is added on to a head in the derivation is always checked before the original features are checked. So now the [MD] feature of Fin must be checked before the  $\phi$  feature is checked. Checking of the [MD] feature results in movement of the wh-phrase *which tent* to Spec-FinP,

<sup>5</sup>Cf. Bobaljik and Branigan (2004) and Branigan (2005).

<sup>6</sup>Holmberg and Platzack (2003) also propose that Fin attracts the subject or T. In their model, which is quite similar to what I am proposing, Fin checks an unvalued [ $\mu$ Fin] feature on T or the subject. For them, the [Fin] feature is part of the person agreement features, so we are largely in agreement even in the feature details. Holmberg and Platzack's model does not, however, derive the movement of non-subjects to Spec-FinP from phase theory.

<sup>7</sup>The idea that an A-bar head below C bears  $\phi$  features is proposed in Branigan (1992) and Shlonsky (1994) as the basis for Germanic complementiser agreement phenomena.

<sup>8</sup>This is the point where I depart most obviously from Pesetsky and Torrego's approach. For them, T raises to C in declarative sentences, despite what the word order seems to show. For me, the subject raises instead, which is consistent with observable word order, and all other tests, as far as I can determine.

producing the structure in (35).

- (35)  $[\text{FinP } \text{which tent Fin } [\text{TP Sheila T pitch } t ]]$   
 $\begin{bmatrix} MD \\ wh \end{bmatrix} \quad \begin{bmatrix} \phi \\ EPP \end{bmatrix} \quad [\phi] \quad [\phi]$

While the problem with the *wh*-phrase is solved in (35), the original  $\phi$  and EPP features of Fin still remain to be checked. Following Pesetsky and Torrego, I suppose that in this situation, movement of T to Fin allows the requisite feature checking to take place. For one thing, T bears the same  $\phi$  features as the subject at this point of the derivation, because the  $\phi$  features of T themselves have been valued by checking the subject DP. If we assume that uninterpretable features are not erased until Spell-Out, then the  $\phi$  features of T should be available to Fin.

The status of the EPP feature of Fin is less obvious. Notice that Fin has already checked an EPP feature once in this derivation, by attracting the *wh*-phrase to check its [MD] feature. The remaining EPP feature cannot therefore require that a new specifier be formed for FinP. Again following Pesetsky and Torrego, I suppose that in this case, movement of the head of TP up to Fin is the only way for the second EPP feature to be satisfied.

Notice that the primary properties of Fin remain constant in all contexts in this model. Fin always starts off the derivation with  $\phi$  and EPP features, so it must always check either the subject or T. What makes the difference between subject-aux inversion sentences and all the others is the addition of a *wh*-phrase attracting [MD] feature to the head of FinP in contexts where only this will make the sentence convergent.

Notice as well that the major characteristics of subject-aux inversion are now reduced to axiomatic, universal principles. Deferred phase Spell-Out ensures that the Spec-FinP landing site for *wh*-movement is required only in root clauses. And the checking properties of Fin are such that either the subject or T will always be attracted upwards, with subject movement being preferred. While some parametric variation in the particular features of Fin may be expected (and evidently necessary), the mechanics of the checking operations involved in subject-aux inversion will nonetheless be universal.

## 6 Verb second structures in general

English subject-aux inversion is not restricted to questions, and subject-aux inversion itself is just a special case of the more general Germanic verb-second pattern. The analysis put forward above can now be put to the test by examining its applicability in a wider array of cases.

Let us begin with negative inversion.

- (36) a. No one pitched the tent.  
b. \*No one did pitch the tent.
- (37) a. \*No tent Sheila pitched.  
b. No tent had Sheila pitched.  
c. \*Nowhere better Sheila pitched a tent.

- d. Nowhere better had Sheila pitched a tent.
- e. \*Never before Sheila pitched the tent.
- f. Never before had Sheila pitched a tent.

In root clauses, the pattern with negative inversion is much like that of questions: negative subjects cannot trigger T-to-Fin movement, and preposed negative non-subjects do. Negative inversion is less restricted than interrogative inversion, however, because the former is also possible in embedded contexts.

- (38) a. Jane realized that never before had Sheila pitched a tent.  
 b. That on few earlier occasions had Ted mixed a martini would prove unfortunate.

In both root and embedded contexts, the preposed negative phrase is interpreted as the focus of the clause. Following Rizzi (1997), I suppose that clausal foci are (sometimes) associated with a Focus head above Fin and below C in the left periphery. Then the structure of (37-b) will be (39).

- (39) [CP C [FocP Foc [FinP no tent had-Fin [TP Sheila *e* pitched *t* ]]]]

Like C, Foc appears outside the portion of the root clause which is subject to Spell-Out, so it can have no phonetic content in (39). Nevertheless, Foc must check a [focus] feature on the preposed phrase to ensure convergence at LF. This checking operation is what drives movement of the negative phrase to FinP, albeit indirectly. Since FinP is phasal, Foc cannot check a phrase inside it unless it appears at the phase edge.

The mechanics of movement in negative inversion will be exactly the same as in root questions. In order to attract a focal phrase to the edge of FinP, a [MD] feature is added to the Fin head, along with an EPP feature. Since negative phrases are monotone decreasing, the [MD] feature may attract them. And since the original  $\phi$ /EPP features of Fin are checked only after the negative phrase raises to Spec-FinP, the head of T must be raised and checked in place of the subject.

Since Foc does not bear an EPP feature, the same type of derivation is possible in embedded contexts. In all cases, the preposed negative is raising close enough to Foc to allow checking to take place, but the negative phrase never raises all the way to Spec-Foc.

Inverted word order is not possible in modern English with non-negative foci.

- (40) a. THIS TENT, Sam had pitched before.  
 b. \*THIS TENT had Sam pitched before.  
 c. At every opportunity Sam goes camping.  
 d. \*At every opportunity does Sam go camping.  
 e. ?They believe that BEANS, we like.  
 f. \*They believe that BEANS do we like.

I consider the ungrammaticality in these cases to reflect the nature of the specific feature which Fin may use to attract non-subjects to its specifier position. If the only feature available for such a rescue operation is [MD], then phrases which are not monotone decreasing will simply not be

subject to attraction by Fin unless they are subjects.

The grammatical examples (40-a,c,e) reflect the other option which is available for allowing phrases to escape from FinP, which is adjunction to FinP. Just as wh-phrases in embedded questions raise to Spec-CP by first adjoining to FinP, so in (40-a), the preposed phrase adjoins to FinP to get close enough to Foc to allow checking to take place. Then the structure of (40-a) will be (41).

(41)  $[_{CP} C [_{FocP} Foc [_{FinP} \text{this tent} [_{FinP} \text{Sam Fin} [_{TP} t \text{ had pitched } t \text{ before} ]]]]]]$

The adjunction option must not be possible for negative phrases, however. Otherwise examples (37)[a,c,e] would be fine. Since nothing in the structure prevents adjunction from taking place, I suppose that there is a preference for the use of specifier positions provided by the architecture of the derivation. In other words, adjunction of a phrase to FinP takes place only if the derivation cannot have placed that phrase in Spec-FinP. If we consider the order of operations involved, the reason why such a preference should exist becomes clear. Consider the structure of (37)[b] at the point where FinP is first formed by Merge:

(42)  $[_{FinP} \text{Fin} [_{TP} \text{Sheila had pitched no tent} ]]$   
 $\begin{array}{ccccccc} [\phi] & & [\phi] & & [\phi] & & [MD] \\ & & & & & & [+focus] \end{array}$

At this point in the derivation, it is clear that the phrase *no tent* must be removed to the phase edge. Since Fin has not yet completed its checking operations, it is still possible to provide new checking features to Fin to address any problems. It is not yet possible to perform operations like adjunction to FinP which rely on the phase being complete. So the first tactic which can be considered to resolve the focus problem is addition of an attracting feature to Fin. Since [MD] can be added to Fin, and since the phrase can be attracted with this feature, the problem is resolved at the earliest point possible.

Now compare (42) with the situation in (43), the first FinP structure of (40):

(43)  $[_{FinP} \text{Fin} [_{TP} \text{Sam had pitched THIS TENT before} ]]$   
 $\begin{array}{ccccccc} [\phi] & & [\phi] & & [\phi] & & [+focus] \end{array}$

In (43), the focal phrase problem will not be resolved by adding [MD] to Fin, because the phrase *this tent* cannot be attracted by [MD]. The problem cannot be resolved at all until Fin has completed its checking operations (by checking  $\phi$  on Sam) and the phase is complete. Only then does adjunction become a possibility, and since the problem has not yet been resolved, this possibility is activated.<sup>9</sup>

<sup>9</sup>Since movement to Spec-FinP is preferred to adjunction, one might expect subject-aux inversion to be required in embedded questions, contrary to fact. This raises the question why sentences like (i) are excluded:

i. We wondered  $[_{CP} \text{which tent } C [_{FinP} t \text{ had-Fin} [_{TP} \text{Sheila } e \text{ pitched } t ]]]]$

In Branigan (2004), I argue that sentences like (43) represent a *that*-trace violation, because movement from Spec-FinP

As is well known, the non-English Germanic languages generally exhibit verb-second word order in root clauses, as well as in some embedded clause contexts. Given the analysis of English ‘residual verb-second’<sup>10</sup> developed above, it should now be possible to say something about the general pan-Germanic pattern.

Consider the typical Dutch root clause paradigm in (44).

- (44) a. Wat heeft Hans gelezen?  
           *what has Hans read*  
       b. Dat boek heeft Hans gelezen.  
           *this book has Hans read*  
       c. Hans heeft dat boek gelezen.  
           Hans has read this book

As in English root questions, the *wh*-phrase in (44-a) must raise to Spec-FinP to reach a position where the silent root *C* can check its [*wh*] feature. The finite verb *heeft*, which presumably raises to *T* in all clauses, is then attracted to *Fin* to check its  $\phi$ /EPP feature. Root questions in English and elsewhere in Germanic appear to be essentially identical.

The (44-b) example has no English counterpart. As we have already seen, parallel sentences are impossible in English because when *Fin* is involved in triggering A-bar movement, it can only do so by taking on the [*MD*] feature, which checks only monotone decreasing quantificational elements. Clearly, in Dutch, and elsewhere in Germanic, the *Fin* head must be somewhat more versatile, because *Fin* *must* be able to attract other types of topics. Let us suppose, therefore, that there is a feature which is complementary to [*MD*], which can attract phrases which are not monotone decreasing. I will refer to this other feature as [*MI*] (monotone increasing). In Dutch, *Fin* can take on either [*MD*] or [*MI*] in order to attract topics and foci to the left edge of *FinP*. (Positive evidence must then be accessible in the linguistic environment of a Dutch child to allow her to learn this featural property of *Fin*.)

Now the topicalisation structure in (44-b) has the form it has because *Fin* in Dutch can take on the [*MI*] feature which allows it to attract a topic to Spec-*FinP* in order to make it accessible for checking by a higher Topic head. And again, the finite verb must then raise to *Fin* in order for *Fin* to check its [*Tense*] feature.

- (45) [<sub>CP</sub> *C* [<sub>TopP</sub> Top [<sub>FinP</sub> dat boek heeft-*Fin* [<sub>TP</sub> Hans *e t* gelezen ]]]]
- $\left[ \begin{smallmatrix} \text{topic} \\ \text{MI} \end{smallmatrix} \right]$ 
 $\left[ \begin{smallmatrix} \text{topic} \\ \text{MI} \end{smallmatrix} \right]$ 
 $[\phi]$ 
 $[\phi]$

Example (45-c) also has no analog in English syntax. In this case, the  $\phi$ /EPP feature of *Fin* is presumably checked by the subject, which raises to Spec-*FinP*. The finite verb is not therefore required to raise to *Fin* for reasons involving the [*Tense*] feature. Something else must be going on

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to Spec-CP is the same operation which is blocked in other *that*-trace contexts. In order to keep the present paper smaller, I refer the reader to that work for the elaboration of this point.

<sup>10</sup>The term belongs to Rizzi (1990).

which triggers the verb movement in this case.

It is necessary to say that English and Dutch differ in some way simply in order to achieve descriptive adequacy with respect to sentences like (45-c). The difference should not, however, be a deep one. Basic principles governing derivations must be identical in both languages. Optimally, in fact, the difference should be quite shallow, involving some small variable property of a single functional category.

Zwart (1993) proposes that Agr<sub>S</sub> in Dutch is defective in that it must be attached to a head with lexical content. English, in contrast, has an Agr<sub>S</sub> which can stand alone. Adapting this proposal to the current model, we may say that English Fin may stand alone, while Dutch Fin must be attached to another head. In that case, the verb movement in (45-c) may reflect a repair strategy in which the finite verb raises to Fin simply in order to satisfy the latter's 'affixal' requirements. (And the same could then be true of T-to-Fin movement in subject-initial root clauses in other Germanic languages.) We may even suppose that the verb movement in (45-c) is a stylistic operation, which takes place after all core syntactic operations (within a phase) are finished. The difference between Dutch and English then is minimal, involving only the affixal status of Fin.<sup>11</sup>

In embedded clauses, verb-second word order is severely constrained in Germanic, except for Yiddish (Diesing, 1990) and Icelandic (Thrainsson 1987). In Dutch, for example, verb-second word order is possible only in the complement to bridge verbs, and in certain conjunction structures discussed below.

Leaving aside for the moment the restricted distribution of embedded verb-second clauses, consider how the affixal nature of Fin plays a role in Dutch embedded clause word order in general. In normal clauses, C will value its [finite] feature by checking Fin. The same is presumably true in a Dutch sentence like (46).

- (46) Piet zei [CP dat-Fin [FinP Hans *t* [ *t* deze boek gelezen heeft ]]]  
*Piet said that Hans this book read has*

In English, there is no reason to suppose that the relationship between C and Fin is any stronger than a checking operation. In Dutch, however, the [finite] checking operation also triggers a head-movement effect which raises Fin to C. As a fortuitous side-effect of the attraction of Fin by C, Fin will be attached to a head with lexical content, as it must be. In general, then, in non-verb-second embedded clauses, the lexical support for Fin may come from the higher C which attracts it. No stylistic verb movement to Fin is then motivated (and none occurs)

(In Dutch root clauses, of course, the complementiser is necessarily silent, and cannot attract Fin. In root clauses, the stylistic operation is the only way available to support affixal Fin.)

As with Zwart's theory, this approach to embedded clause structure provides an immediate account of the embedded v/2 structure found in Dutch 'assymetric coordination' (Hoekstra, 1994). (The data in (47) comes from Hoekstra, p. 288, 295.)

<sup>11</sup> It is significant that the affixal requirements of Fin are not sufficient to override the EPP preference for a specifier over a raised head. In effect, an uneconomical derivation is preferred to the economical alternative. This peculiarity may be taken as evidence that the verb movement seen in subject-initial verb-second clauses truly is a stylistic PF operation, and therefore excluded from considerations of derivational economy.



- (47) a. Het irriteert ons dat je te laat thuiskomt en je hebt geen sleutel bij je.  
*it irritates us that you too late home come and you have no money with you*  
 b. Als je te laat thuiskomt en je hebt geen geld bij je, dan ...  
*if you too late home come and you have no money with you, then*

In this construction, the first of two conjoined clauses is verb-final, while the second has the verb in second position. What makes this construction possible is the acceptability in Dutch (and German) of an apparent violation of the Coordinate Structure Constraint in which the first of two clausal conjuncts has a constituent extracted from it. In this construction, the dependent Fin head in the first clause is raised to the matrix C, leaving the second Fin inside its own clause, in a position where support can be found only if the verb raises to Fin.

- (48) Het irriteert ons [<sub>CP</sub> dat-Fin [<sub>FinP</sub> je e [<sub>TP</sub> t te laat thuiskomt ]] en  
 [<sub>FinP</sub> je hebt-Fin [<sub>TP</sub> t geen sleutel bij je e ]]]

What now can be said about the restricted embedded verb-second pattern in languages like Dutch, where the verb-second pattern is found once again.

- (49) Piet zei dat dat boek kende hij niet.  
*Pete said that that book knows he not*

Given the structure proposed for root topicalisation structures, the embedded clause in (49) will have the form (50):

- (50) Piet zei [<sub>CP</sub> dat [<sub>TopP</sub> Top [<sub>FinP</sub> dat boek kende-Fin [<sub>TP</sub> hij t t niet ]]]]

The Top head once again checks the [topic] feature on the phrase in Spec-FinP. The topic itself has been attracted to Spec-FinP by an [MI] feature on Fin, so that the finite verb raises to Fin to check its [Tense]feature.

Since the finite verb raises to Fin, Fin in (50) has no need for additional morphological support. As far as the requirements of Fin are concerned, the structure of the embedded clause in (50) is entirely satisfactory. But the [finite] feature of C is not checked in the usual way in this structure. If neither Fin or a [Tense]-bearing subject raise to C, then we would expect the derivation to crash. What then makes this type of structure possible?

The general answer for Dutch embedded clauses is that this structure is not possible. Recall that embedded verb-second structures in this language are restricted to complements of bridge verbs. A reasonable conclusion to draw is that there is something special about bridge verbs which somehow exempts the complementiser in (50) from satisfying its checking requirements in the usual way. In fact, the simplest conclusion to draw is that C does not need to check [finite] at all in this context. But outside of this unique context, C will have no way to check its [finite] feature in an embedded verb-second structure, and the derivation will then crash.

As for the specific property of bridge verbs which allow C to avoid checking a [finite] feature, I can only speculate. Bridge verbs in general allow for complement clauses with a range of

‘defective’ properties. ECM complements, for example, lack CP structure entirely, which is otherwise not permitted. The same is true of small clauses, which are normally permitted only as complements to bridge verbs. This might coincide with some sort of abstract incorporation of the defective C by the bridge verb, as in Pesetsky (1992).<sup>12</sup>

In fact, there is clear evidence in mainland Scandinavian that the complementiser found with embedded verb-second clauses has properties distinct from those of other declarative complementisers, despite their phonetic identity. First, the *att* complementiser which appears in verb-second constructions does not behave like the *att* we find with other types of embedded declaratives. When not associated with a v/2 clause, *att* may be omitted in complement clauses. But omission of *att* with verb-second clauses is impossible (Holmberg, 1986).

- (51) \*Per sa han köpte inte boken.  
*Per said he bought not book-the*

The second difference between the *att* used in v/2 complements and the default *att* is cofound in conjoined complement clauses, where it is peculiarly constrained. When two such clauses are conjoined, the *att* complementiser appears only before the first clause. (Thanks to Anders Holmberg for the data.)

- (52) Jag tror att Per äter inte kött och (\*att) Anna dricker inte öl.  
*I believe that Per eats not meat and that Anna drinks not ale*

There is no obvious explanation for why the defective complementisers should have these particular properties, but these facts do show the necessity for a distinction between the two classes of declarative complementisers.

Whatever the precise mechanism which makes bridge verbs complements special is, it also appears to allow complementisers to be entirely absent in German. In this language, embedded verb-second complements appear both as bare TopP, as in (53-a), and as bare FinP, as in (53-b).

- (53) a. Anna glaubt, das Buch habe Hans-Peter gelesen. (German)  
*Anna believes the book has Hans-Peter read*  
 b. Anna glaubt, Hans-Peter habe das Buch gelesen. (German)  
*Anna believes Hans-Peter has the book read*

Given a Top head which checks the [Topic] feature on *das Buch*, the structure of (53-a) will be:

- (54) ...glaubt [<sub>TopP</sub> Top [<sub>FinP</sub> das Buch V-T-Fin [<sub>TP</sub> Hans-Peter ...*t* ... ]]]

As in Dutch or Swedish, FinP will attract the topic with its [MI] feature and the finite verb with its  $\phi$ /EPP feature. Since there is no higher complementiser in the complement clause, the issue of C attracting Fin is moot. And the affixal requirements of Fin are satisfied by the position of the finite

<sup>12</sup>See also Bošković and Lasnik (2003) for an updated model of C incorporation which is largely compatible with the analysis developed in the text.

verb.

In (54-b), the structure of the complement clause is reduced still further: (55).

- (55) ... glaubt [<sub>FinP</sub> Hans-Peter V-T-Fin [<sub>TP</sub> *t* das Buch ... *t* ... ]]

Here, the subject raises to check [Tense], and no TopP projection need be present at all. Notice that the verb raises to Fin, as in a root clause, to satisfy Fin's affixal needs.

The situation is quite different for Yiddish and Icelandic. In both cases, embedded verb-second clauses are found in a wider set of syntactic contexts, as illustrated in (56)–(57), taken from Vikner (1991).

- (56) a. John tsveyfelt az morgen vet Miriam fri oyfshteyn. (Yiddish)  
*John doubts that tomorrow will Mary early get up*  
b. Ikh veys nit far vos in tsimer iz di ku geshtanen.  
*I know not for what in kitchen is the cow stood*
- (57) a. Jón efast um að á morgun fari María snemma á fætur. (Icelandic)  
*John doubts that tomorrow will Mary get up early*

In both languages, embedded verb-second order is found in the complements to non-bridge verbs. In Yiddish, as already discussed in section 3, verb-second order is also sometimes possible inside an indirect question.

The same is true of English, to some extent. For some speakers, negative inversion is possible both in complement clauses and in other embedded contexts, although the interpretation of such structures will often be unfelicitous.

In these languages, the distribution of embedded verb-second structures cannot be based on licensing conditions for a defective C, because defective C should not be licensed so freely. Instead, we must suppose that C is able to check its [finite] feature freely in these languages, despite the presence of a Top or Foc head between T and Fin. There are two ways that this could be possible. It could be the case that the intervening heads themselves bear [finite] features, so that C can check Top or Foc directly. Otherwise, the intervening heads must be transparent to the checking operation involving C and Fin. In either case, the verb-second word order will still reflect the movement of T to Fin to satisfy Fin's affixal requirements.

In English, as already discussed, topicalisation or focus movement is often achieved by adjunction of the topic/focus to FinP. A similar pattern arises in some Germanic languages, where the interaction between inversion and adjunction structures is slightly richer than in English. In Swedish, for example, sentential adverbs can be found before the subject in embedded clauses, but not in root clauses.<sup>13</sup> Vikner (1991) provides the data in (58)).

- (58) \*(Hon sa att) tyvärr Johan inte har läst denna boken.  
*(She said that) unfortunately Johan not has read this book*

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<sup>13</sup>Thanks to Anders Holmberg for pointing this out to me.

The root/embedded clause asymmetry here makes sense if the Merged adjunction site for the adverb is outside the domain of application of Spell-Out in a root clause, i.e. outside FinP. Since the adverb is to the right of the complementiser *att* in (58), the adjunction site must be a category between C and FinP. TopicP seems the most natural candidate in this case. If the adverb *tyvärr* is adjoined to a Topic head, then it will not be accessible for Spell-Out in a root clause, but Spell-Out will interpret it when it interprets the complementiser in the embedded clause.

There is actually no reason to suppose that the Swedish embedded clause structures are absent in English. Consider (59), for example.

- (59) a. She said that unfortunately John won't walk the dog.  
 b. Unfortunately John won't walk the dog.

In principle, the adverb *unfortunately* might be adjoined to any head in the region between *that* and *John* in (59-a). If no TopP is present, then the adverb must be adjoined to Fin. But if TopP is included in the clause, then the adverb may well be adjoined to TopP instead. In (59-b), of course, the adverb must always be adjoined to FinP, since TopP cannot be Spelled-Out.

Why should adjunction be restricted to Topic heads in Swedish, but allowed for FinP in English? One might suppose that this is a simple matter of parametric variation. Perhaps there could be a parameter associated with different functional heads which determines whether each head permits something else to adjoin to it, or to its projections. It is likely, however, that such an account would be far too powerful, and would lead us to expect much more language variation than we actually find. (The burden placed on a child learning her language in such a model would also be commensurately large.)

Fortunately, a less powerful, and more interesting account of the Swedish/English difference is at hand. Topicalisation in Swedish follows the general pan-Germanic pattern, with topics raised to clause-initial position and verb-second word order an obligatory side-effect.

- (60) Denna boken har han inte läst.  
*this book has he not read*

Since topics can now always be raised into Spec-FinP by using either [MD] or [MI] features, it follows that they never need to adjoin to FinP. In other words, the existence of regular Swedish verb-second topicalisation structures is what blocks adjunction to FinP.

## 7 Conclusions

The general issue of cyclicity in grammar never goes away. Phase theory is in some senses nothing other than a new version of subjacency theory, or the Strict Cycle condition. But the delight is in the details. What I hope to have shown here is that the specific implementation of Spell-Out operations in phase theory is important because it leads directly to a principled explanation of some long-standing problems.

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