chapter 11

Wh-movement

0. INTRODUCTION

In chapter 10, we looked at DPs that were appearing in positions where they didn't get theta roles. Instead, the DP surfaced in a derived position. That is, they were moved from the position where they got a theta role to a position where they could get Case. The trigger for this movement was the requirement that DPs check their Case feature, as Case can only be assigned in specific structural positions. In this chapter, we turn to another kind of phrasal movement, one where DPs already have Case. DPs (and other phrases) can move for a different reason to form what are called **wh-*questions.***

There are several different kinds of questions, only two of which we are concerned with in this book. The first kind is the familiar ***yes/no question*** that we looked at in the chapter on head movement:

1) a) Are you going to eat that bagel?
   b) Do you drink whisky?
   c) Have you seen the spectrograph for that phoneme?

The answers to these questions cannot be other than *yes*, *no*, *maybe* or *I don't know*. Any other response sounds strange:

1') a') #Pizza/ ✓yes
b') #Scotch/ ✓no
c') #Syntactic tree/ ✓no

The other kind of question is called a *wh*-question. These questions take their name from the fact that the words that introduce them (mostly) begin with the letters <*wh*> in English: *who*/*whom*, *what*, *when*, *where*, *why*, *which*, and *how*. The responses to these kind of questions cannot be *yes* or *no*. Instead they must be informative phrases.

2) a) When did you do your syntax homework? #yes / ✓yesterday
b) What are you eating? #no/ ✓a bagel
c) How is Louise feeling? #yes/✓much better

How these questions are formed is the focus of this chapter.

Who* and *Whom

In traditional prescriptive grammar, there are two *wh*-phrases that refer to people: *who* and *whom*. *Who* is used when the *wh*-phrase originates in subject position and gets nominative Case. *Whom* is the accusative version. In most spoken dialects of Canadian and American English this distinction no longer exists, and *who* is used in all environments. For the sake of clarity, I use *who(m)* to indicate that the *wh*-phrase originated in object position, but you should note that from a descriptive point of view *who* is perfectly acceptable in object position for most speakers today.

1. MOVEMENT IN *WH*-QUESTIONS

If you look closely at a statement and a related *wh*-question, you'll see that the *wh*-phrase appears in a position far away from the position where its theta role is assigned. Take for example:

3) a) Becky bought the syntax book.
b) What did Becky buy?

The verb *buy* in English takes two theta roles, an external agent and an internal theme. In sentence (3a), *Becky* is the agent, and *the syntax book* is the theme. In sentence (3b) *Becky* is the agent and *what* is the theme. In the first sentence, the theme is the object of the verb, in the second the theme is at the beginning of the clause. The situation becomes even more mysterious when we look at sentences like (4):

4) What did Stacy say Becky bought?

In this sentence *what* is still the theme of *bought*, yet it appears way up at the beginning of the main clause. This would appear to be a violation of the locality constraint on theta role assignment introduced in chapter 9.

The situation becomes murkier still when we look at Case. Recall that accusative Case is assigned when a DP is the sister to a V:

5) Matt [$_{VP}$ kissed her$_{ACC}$].

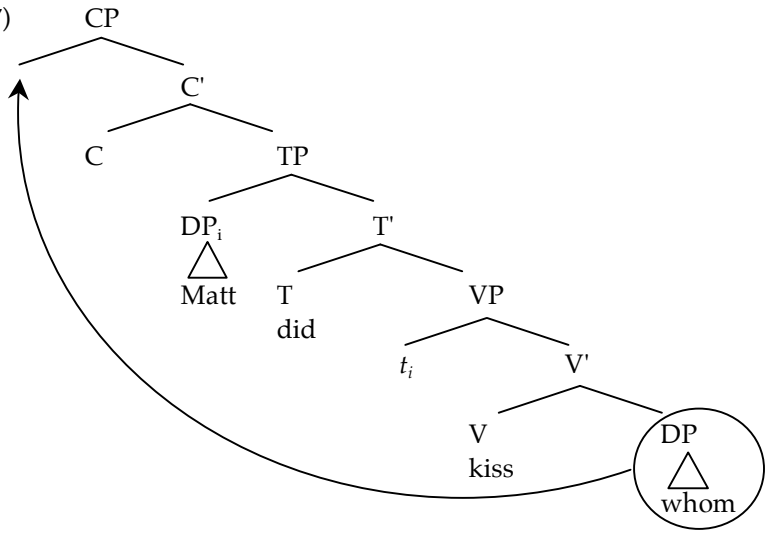
But in *wh*-questions the accusative form (like *whom*) is not a sister to V:

6) Whom$_{ACC}$ did Matt kiss?

So it appears as if not only are these *wh*-phrases not in their theta positions, but they aren't in their Case positions either.

Given what we've seen in the previous two chapters, this looks like another case of movement – this one with different triggers again. Let's start with the issue of where *wh*-phrases move to. One position that we've had for a while, but have not yet used, is the specifier of CP. This is the place *wh*-phrases move to:

7)



Notice that what moves here is an entire phrase. You can see this if you look at slightly more complex *wh*-questions:

8) a) [To whom] did Michael give the book?
   b) [Which book] did Michael give to Millie?

When you move an entire phrase, it cannot be an instance of head-to-head movement (by definition), so this must be movement to a position other than

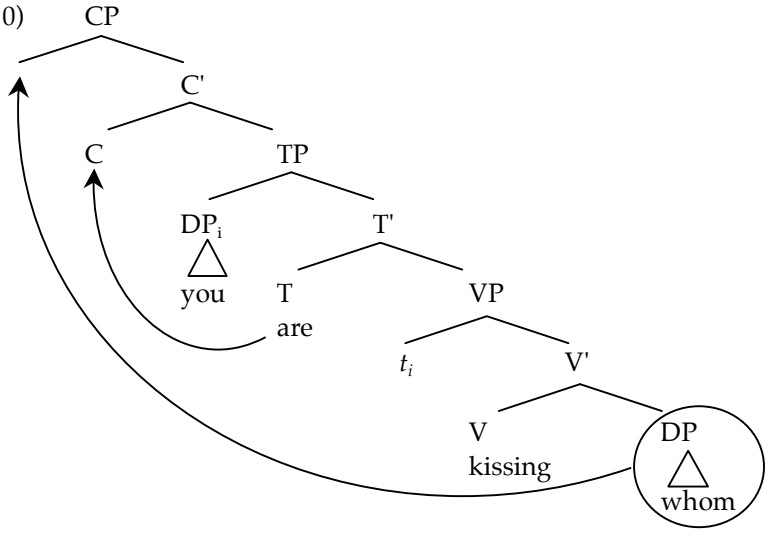
a head, in this case we have the empty specifier of CP. The element that can be moved is either a DP, a PP, or an AdvP.

The movement to the specifier of CP accounts for another fact about the word order of *wh*-questions: they also involve T → C movement (in main clauses):

9) a) Who(m) are you meeting?
   b) *Who(m) you are meeting?

The *wh*-phrase appears to the left of the auxiliary in C. This means that the *wh*-phrase must raise to a position higher than C. The only position available to us is the specifier of CP:

10)



The fact that *wh*-movement is to the CP specifier position can also be seen in languages that allow both a *wh*-phrase and an overt complementizer, such as Irish:

11) Cad ***a*^{L}** tá sa seomra?
    What C-*wh* is in-the room
    "What is in the room?"

In Irish, the *wh*-phrase *cad* "what" appears to the left of the complementizer *a*^{L}, supporting the idea that the *wh*-phrase is in the specifier of CP, the only position available to it. A similar fact is seen in Bavarian German (Bayer 1984):

12) I woass ned wann dass da Xavea kummt.
    I know not when that the Xavea comes
    "I don't know when Xavea is coming."

In English the only thing allowed to appear in C is an inverted auxiliary, other complementizers are not:

13) a) *I asked what that she kissed?
b) *I asked what whether she kissed?

This follows simply from the assumption that the only complementizer that is compatible with *wh*-movement in English is null. In other languages this complementizer has phonological content (e.g., Irish a^L or Bavarian German *dass*).

Let's now consider the possible motivations for *wh*-movement. In chapter 9, we triggered T → C movement with a [+Q] feature that was part of the complementizer. DP movement, in chapter 10, was triggered by a Case feature. We can do the same thing, here, for *wh*-questions, by proposing a feature that triggers *wh*-movement. Let's call this feature [+WH]. It resides in the C of a *wh*-sentence. In some languages (such as Irish), there are special forms of complementizers that represent these features:

14) [–Q, –WH] *go*
[+Q, –WH] *an*
[+Q, +WH] a^L

You get the *go* complementizer when the sentence is not a *yes/no* or *wh*-question. You get the *an* complementizer in *yes/no* questions and a^L in *wh*-questions. The form of the complementizer is dependent upon the features it contains (McCloskey 1979).

A *wh*-phrase moves to the specifier of CP to be near the [+WH] feature. Another way to phrase this is to say that *wh*-phrases move into the specifier of CP to check the *wh*-feature, just like we moved DPs to the specifier of TP to check a [NOM] Case feature in chapter 10. We can formalize *wh*-movement the following way:

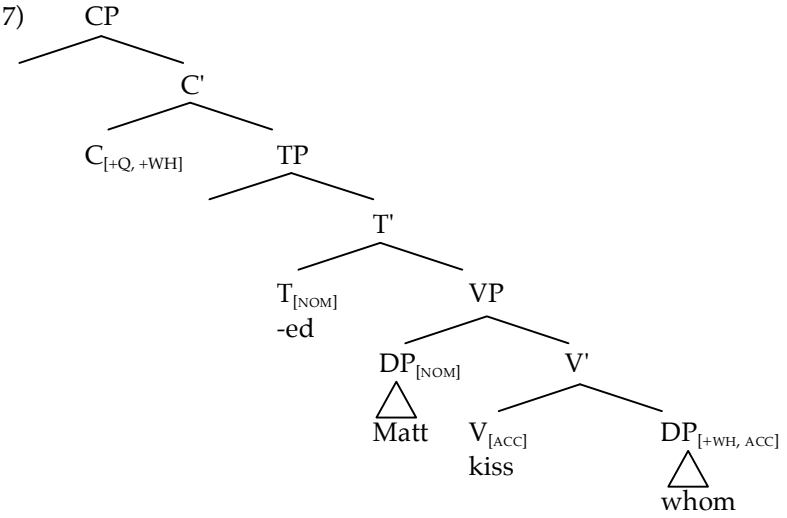
15) *Wh-movement*
Move a *wh*-phrase to the specifier of CP to check a [+WH] feature in C.

Let's do a derivation for the following sentence:

16) Who(m) did Matt kiss?

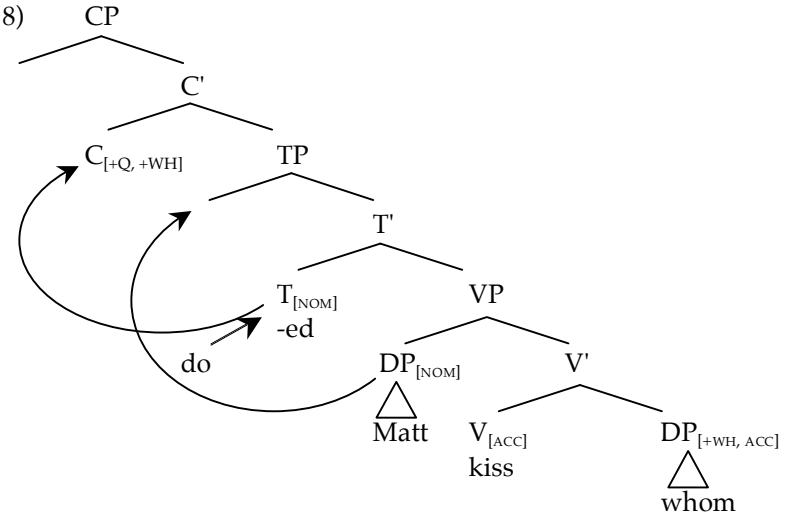
The D-structure of this sentence will look like (17):

17)



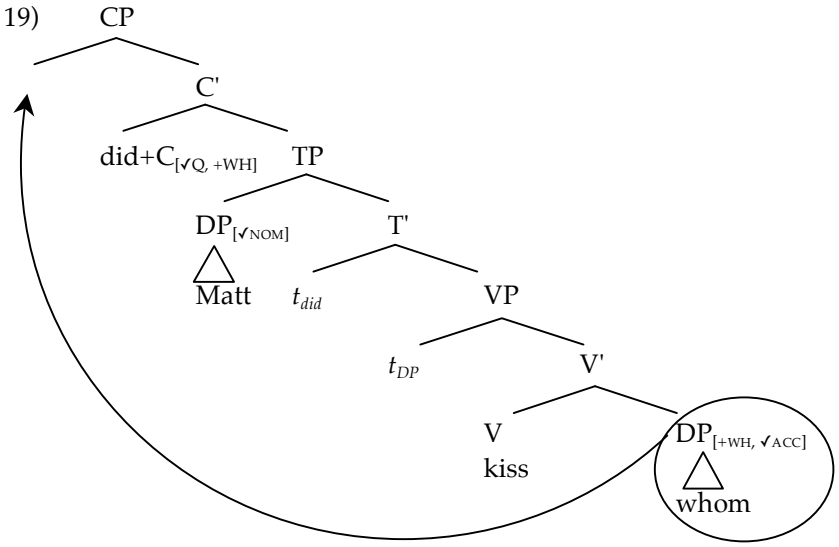
Matt and *whom* both get their theta roles in these D-structure positions. *Whom* also gets its Case in this base position. Three other operations apply: There is DP movement of *you* to the specifier of TP to check the [NOM] feature. There is insertion of *do* to support the *-ed* and we get T → C movement to fill the null [+Q] complementizer:

18)



Wh-movement applies to check the [+WH] feature:

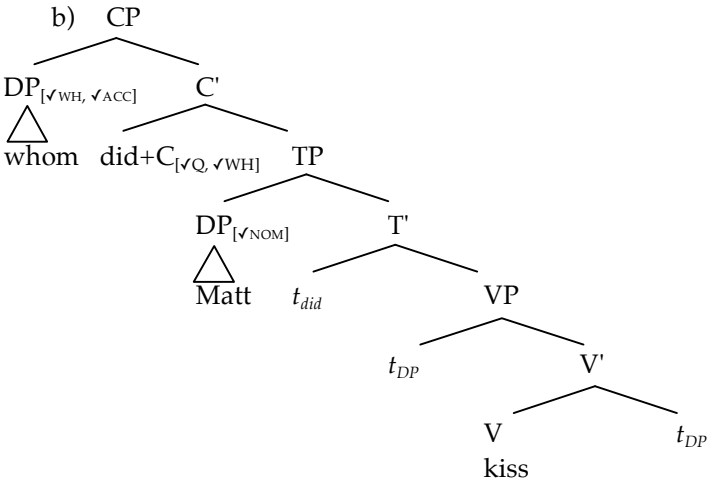
19)



This results in the surface string in (20a) and the tree in (20b).

20) a) Who(m) did Matt kiss?

b)



Traces and *Wanna*-contraction

You may have noticed that I have been marking the position that movement occurs from with a *t* (coindexed with the word it replaces). The *t* here stand for "trace." Later in this chapter we'll see that traces are required to block certain kinds of illicit movement. But an important question is whether there is any reality behind the notion "trace." This is especially important in a theory like Generative Grammar which claims psychological underpinnings. Finding evidence for something that isn't pronounced is remarkably difficult. However, there is some straightforward evidence for traces. First a little background: In spoken varieties of English (both standard and non-standard), function words often contract with nearby words. One such contraction takes non-finite T (*to*) and contracts it with a preceding verb like want:

i) I want to leave → I wanna leave.

This phenomenon is called **wanna-*contraction***. Now consider what happens when you have *wh*-movement and *wanna*-contraction going on at the same time. *Wanna*-contraction is permitted when the *wh*-movement applies to an object:

ii) Who(m)$_i$ do you wanna kiss t_i.

But look what happens when you try to do *wanna*-contraction, when *wh*-movement targets the subject:

iii) Who$_i$ do you want t_i to kiss the puppy?
iv) *Who do you wanna kiss the puppy?

English speakers have very strong judgments that *wanna*-contraction is impossible when the subject is *wh*-questioned. Why should this be the case? If we have traces, the explanation is simple: the trace intervenes between the *to* and the verb. It blocks the strict adjacency between the verb and the *to*, thus blocking contraction:

v) Who$_i$ do you want t$_i$ to kiss the puppy?

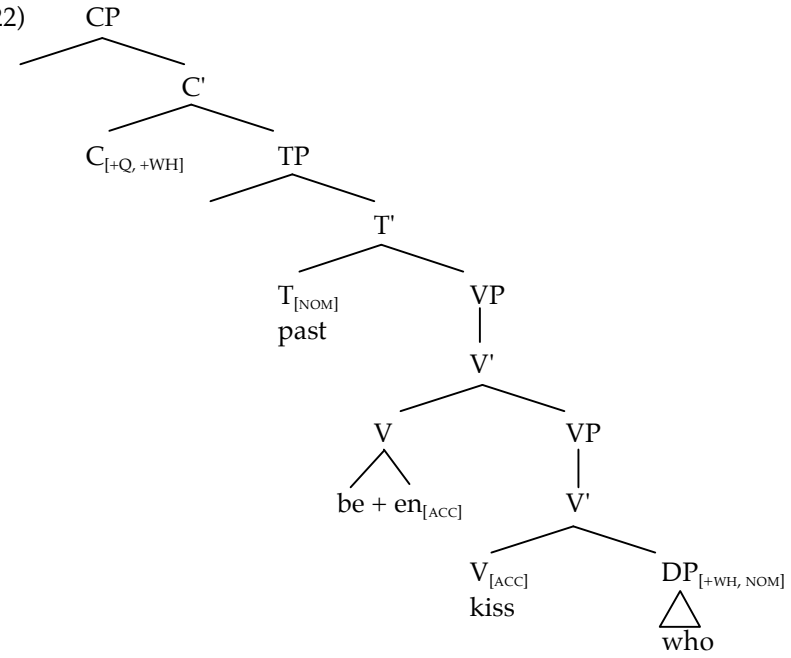
The theory of traces, provides a nice explanation for this fact. For an alternate view see Pullum (1997).

Now let's do a more complicated example. This one involves DP movement, *wh*-movement and T → C movement:

21) Who was kissed?

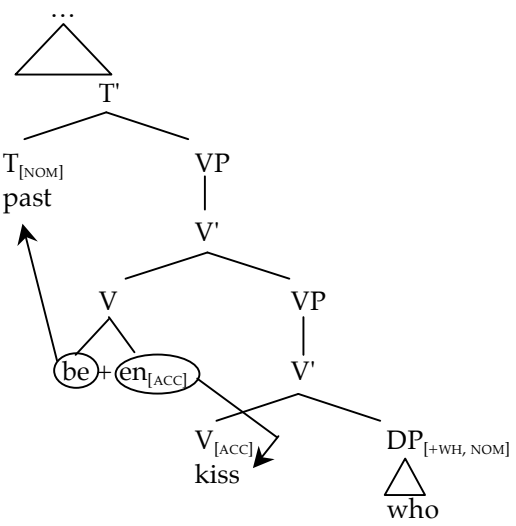
The D-structure of this sentence is given in (22). This sentence is a passive.

22)



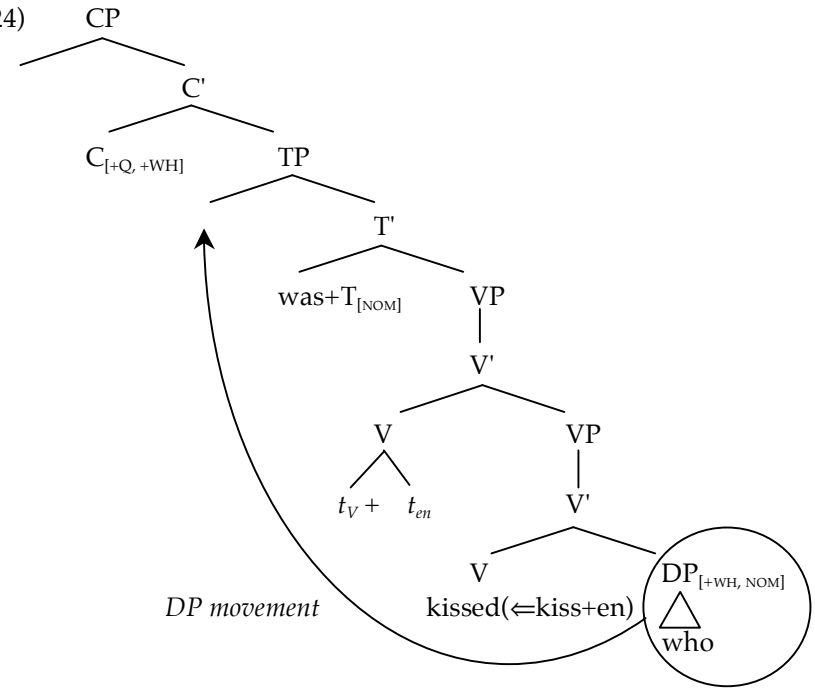
Who is the only argument in the sentence (a theme) and it starts out as a complement to the verb. The suffix *-en* lowers to the verb and absorbs both the agent theta role and the verb's accusative case. Also the auxiliary raises to T to support the tense:

23)



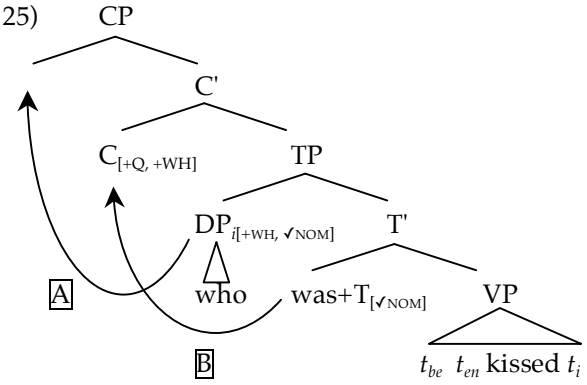
Since *-en* has taken the verb's [ACC] feature, *who* cannot get Case in its base position. It must move to the specifier of TP to check nominative Case:

24)



Once this DP has checked its Case features, it can move on to the specifier of CP for *wh*-feature checking (A). The auxiliary also undergoes T → C movement (B) for the [+Q] feature:

25)



These two movements are "vacuous" in that *who* and *was* are in the order *who was …* both before movements A and B and after them. However, the feature checking requirements force us to claim that both movements occur anyway.

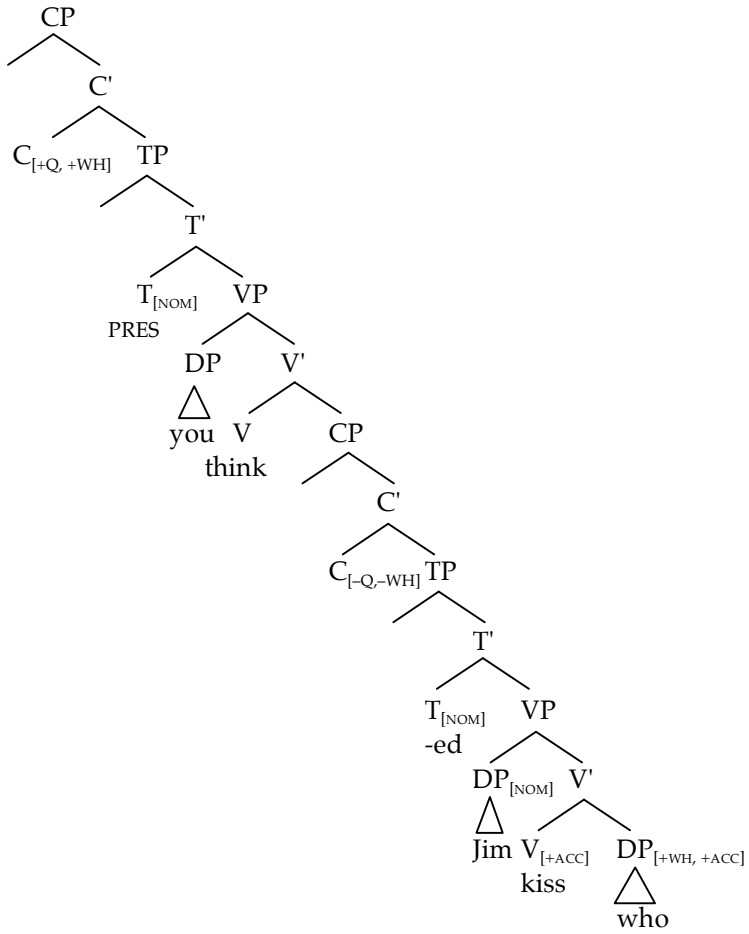
You now have enough information to try Challenge Problem Set 1

Wh-movement can also apply across clauses. Next, we'll do a derivation of a sentence where the *wh*-phrase moves from an embedded clause to the specifier of a main clause CP.

26) Who(m) do you think Jim kissed?

The D-structure of this sentence will look like (27). In this tree, *who(m)* is theta marked by the verb *kiss*, and gets its internal theme theta role in the object position of that verb:

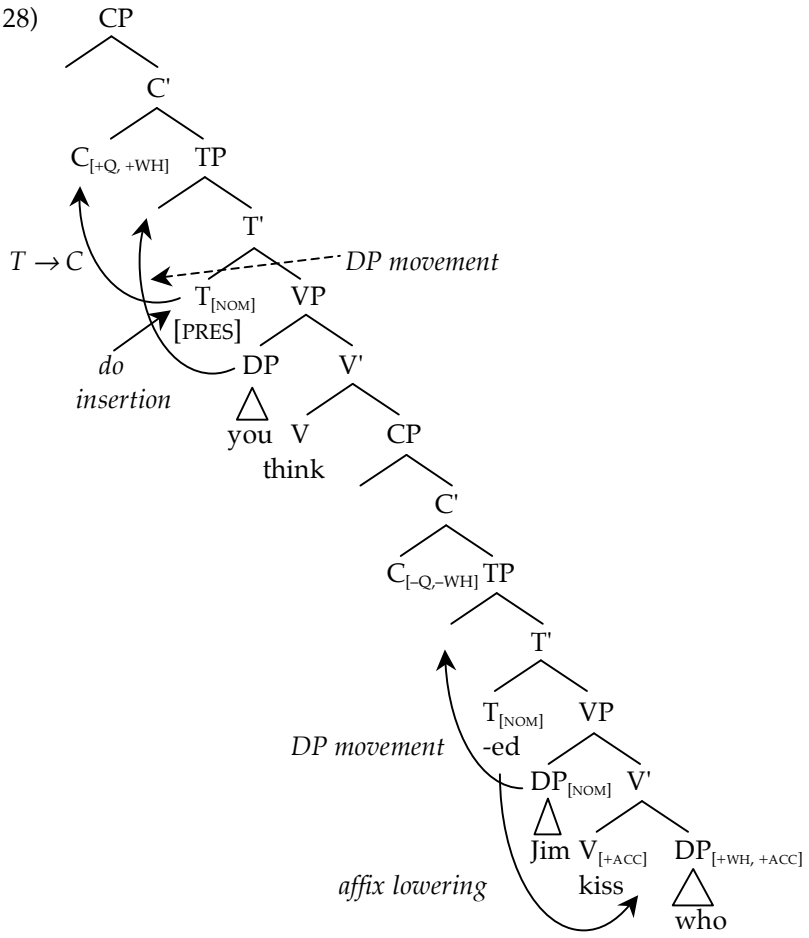
27)



The T suffix *-ed* needs support, so it undergoes affix lowering and the present tense feature on the higher T that requires *do*-insertion. The [+Q] feature on the C also triggers T → C movement. The DP *Jim* moves from the specifier

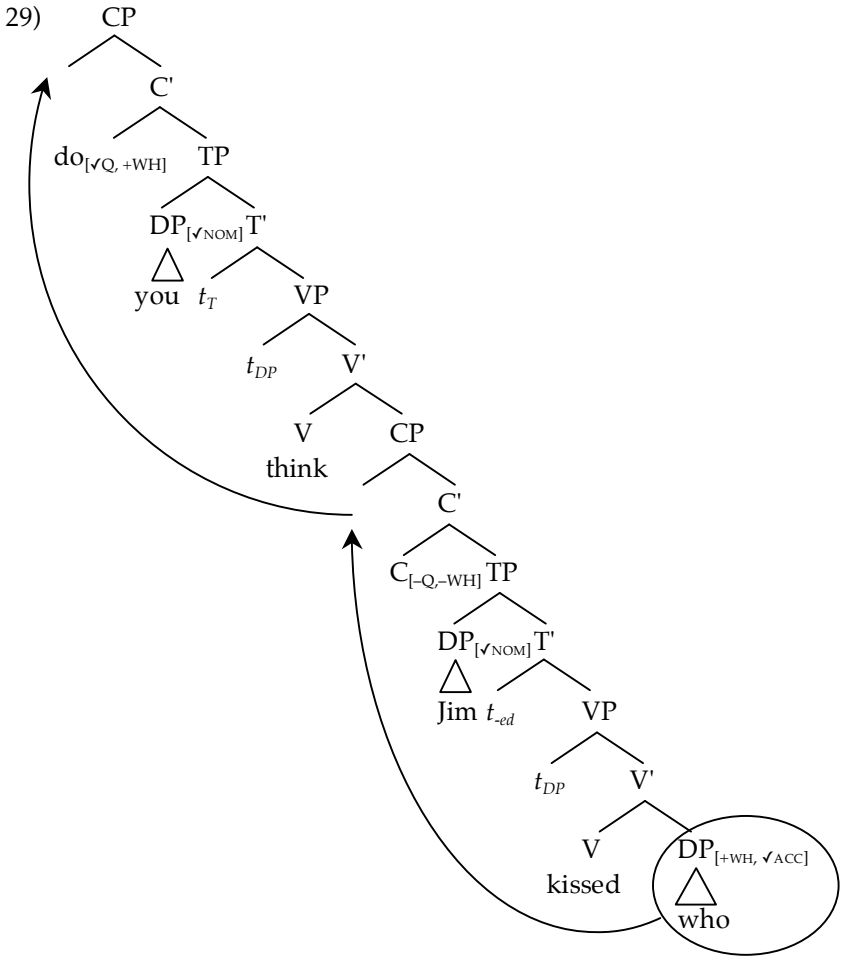
of the embedded VP to the specifier of the embedded TP for EPP and Case reasons. The DP *you* does the same in the higher clause.

28)



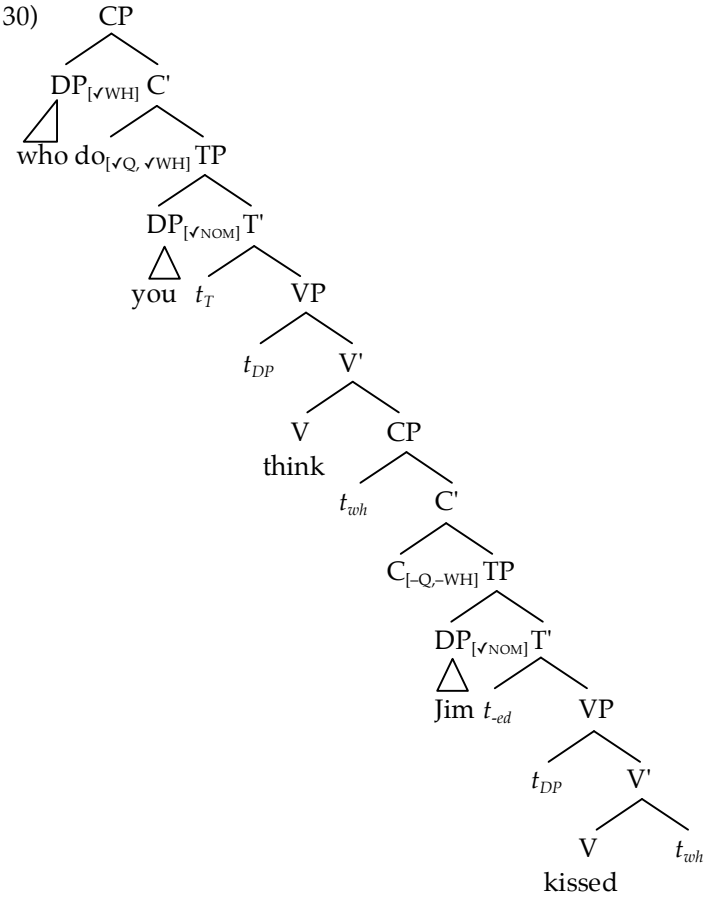
Finally we have *wh*-movement. For reasons that will become clear towards the end of this chapter, we do this movement in two hops, moving first to the specifier of the embedded CP, then on to the higher CP to check that C's [+WH] feature.

29)



This derives the correct S-structure, where the *wh*-phrase is in initial position:

30)



Let's do one more derivation, this time a sentence like the one above, but where the *wh*-phrase stops in the specifier position of the embedded CP:

31) I wonder who Jim kissed.

The main difference between this sentence and (26) lies in the nature of the main verb. In (26) the verb was *think*, that subcategorizes for a CP headed by $C_{[-Q, -WH]}$ (32a). The verb *wonder*[1] differs in that it subcategorizes for a CP headed by $C_{[-Q, +WH]}$, that is the embedded clause has *wh*-movement in it (32b):

[1] We have to assume that there is another verb *wonder*, found in sentences such as *I wonder if Bill left* that selects for a CP headed by $C_{[+Q,-WH]}$.

32) a) *think*

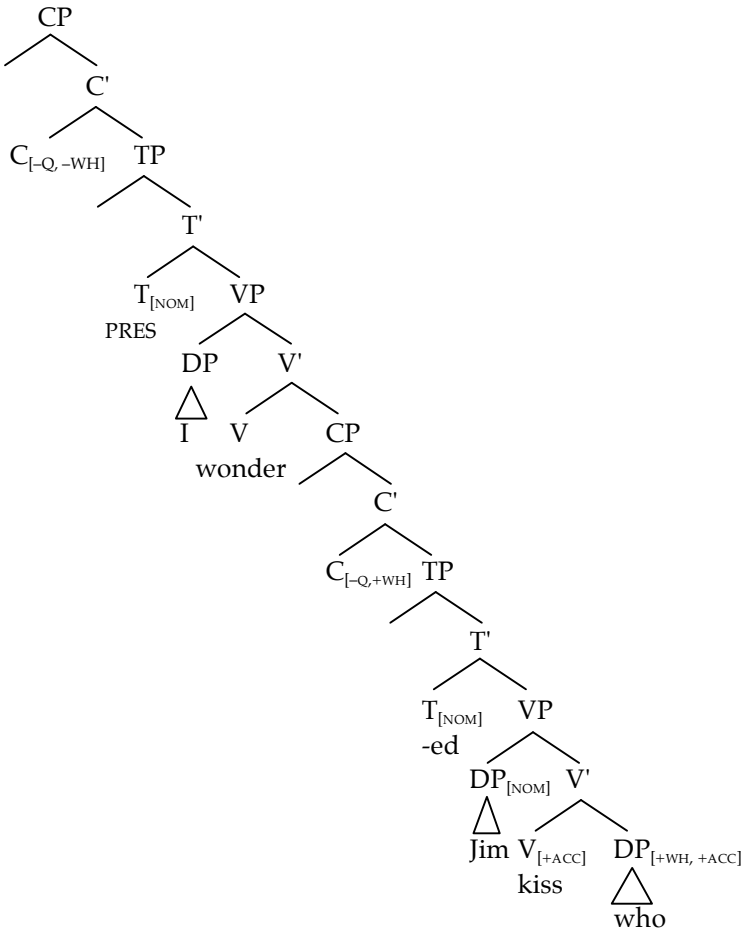
Agent DP	Proposition $CP_{[-Q, -WH]}$

b) *wonder*

Agent DP	Proposition $CP_{[-Q, +WH]}$

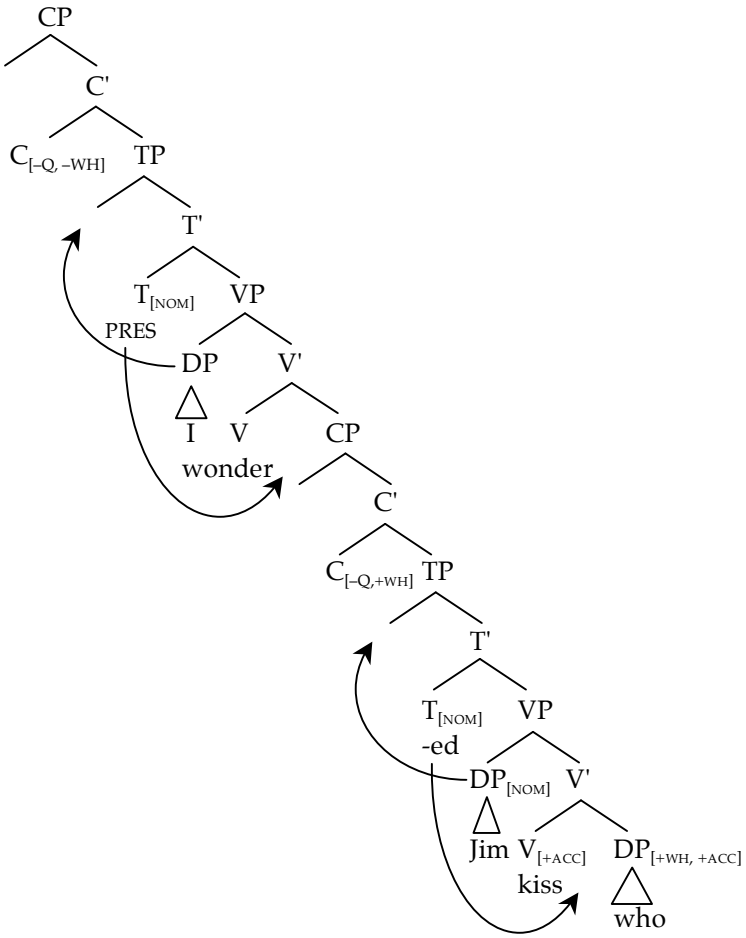
The D-structure for (31) is given in (33); it differs minimally from (27) only in the main verb and the feature structures of the two complementizers. The DPs all get their theta roles in these D-structure positions.

33)



Just as in the previous example, *who* gets its case in its base position; the *-ed* and null PRES affixes lower to the Vs and the two agent DPs (*you* and *Jim*) move to their respective specifiers of TP to get case.

34)



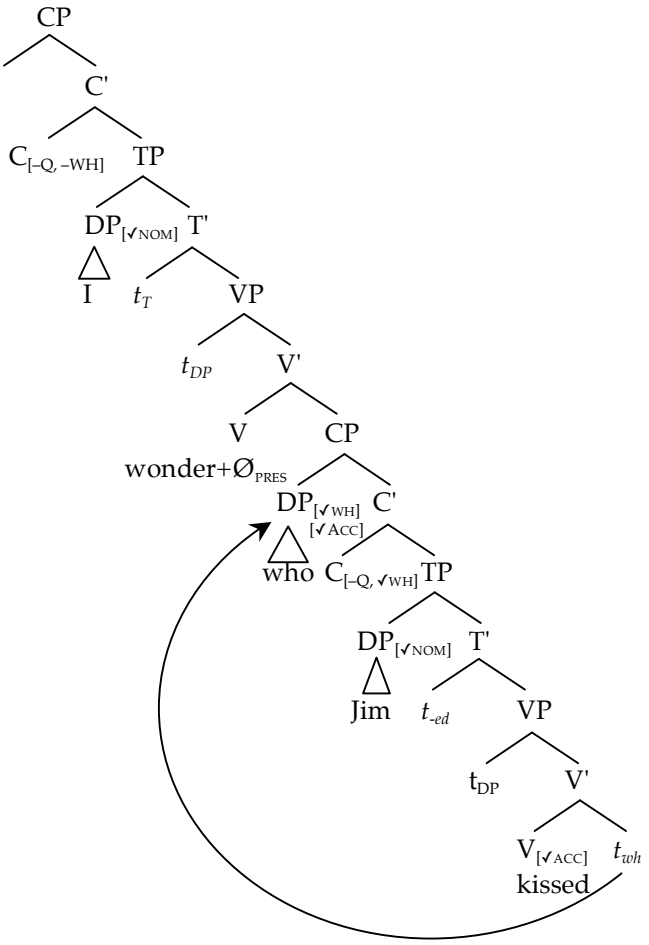
Finally we have movement of the *wh*-phrase. Notice that it only goes to the specifier of the embedded CP. This is because of the featural content of the Cs. The embedded CP is [+WH], the main clause CP is [–WH].

No T → C Movement in Embedded Clauses.
In the main text, we've noticed that *wh*-movement and T → C movement often go hand in hand. One surprising fact about English is that this is not true of embedded *wh*-questions. When a *wh*-question is embedded the subject does not invert with the auxiliary (i.e., no T → C movement):

i) I wonder what he has done?
ii) *I wonder what has he done?

In other words, in embedded clauses there is no $C_{[+Q, +WH]}$. One simple explanation for this is that theta grids simply can't contain $C_{[+Q]}$.

35)



You now have enough information to try General Problem Sets 1–3

2. ISLANDS

Wh-movement isn't entirely free. There are constraints on what categories you can move *out* of (the categories that contain the *wh*-phrase). Compare the following two sentences, one of which has *wh*-movement out of a simple complement CP (36a). The other (36b) moves a *wh*-phrase out of a clause that is contained *inside a DP*:

36) a) What$_i$ did Bill claim [$_{CP}$ that he read t_i in the syntax book]?
b) *What$_i$ did Bill make [$_{DP}$ the claim [$_{CP}$ that he read t_i in the syntax book]]?

In sentence (36a), we see that *wh*-movement ***out*** of a complement clause is grammatical, but movement out of a CP that is dominated by a DP is horrible (36b). This phenomenon, first observed by Ross (1967), has come to be known as the ***Complex DP Island*** phenomenon. The word ***island*** here is meant to be iconic. Islands are places you can't get off of (without special means like a plane), they are surrounded by water, so you are limited in where you can move: You can only move about within the confines of the island. Islands in syntax are the same. You cannot move *out* of an island, but you can move around within it. DPs are islands.

37) *What$_i$ did Bill make [$_{DP}$ the claim [$_{CP}$ that he read t_i in the syntax book]]?

Complex DP Island

The example in (37) involves a CP that is a complement to the N head. The same effect is found when the CP is a relative clause (i.e., an adjunct to the N):

38) *[Which cake]$_i$ did you see [$_{DP}$ the man [$_{CP}$ who baked t_i]] ?

We can characterize this phenomenon with the following descriptive statement:

39) *The Complex DP constraint*
* wh$_i$ [… [$_{DP}$ … t_i …] …]

You now have enough information to try General Problem Set 4

There are many other kinds of islands. One of the most important is called a **wh-*island***. First, observe that it is possible to move a *wh*-phrase to the specifier of an embedded CP, when the C is [+WH]:

40) I wonder [$_{CP}$ what$_i$ C$_{[-Q, +WH]}$ [$_{TP}$ John bought t_i with the $20 bill]].

It is also possible to move (another) *wh*-phrase to the specifier of the main CP:

41) [$_{CP}$ How$_k$ do [$_{TP}$ you think [John bought the sweater t_k]]]?

However, look at what happens when you try to do both (move one *wh*-phrase to the embedded specifier, and the other to the main CP specifier):

42) *[$_{CP}$ How$_k$ do [$_{TP}$ you wonder [$_{CP}$ what$_i$ [$_{TP}$ John bought t_i t_k]]]]?

This sentence is wildly ungrammatical – even though we have only done two otherwise legitimate transformations. Now this isn't a constraint on having two *wh*-phrases in a sentence. Two *wh*-phrases are perfectly acceptable in other contexts:[2]

43) a) How do you think John bought what?
b) I wonder what John bought how.

It seems then to be a constraint on *moving* both of them. The same kind of example is seen in (44a) and (44b):

44) a) I wonder [$_{CP}$ what$_i$ [$_{TP}$ John kissed t_i]].
b) [$_{CP}$ Who$_k$ did [$_{TP}$ you think [$_{TP}$ t_k kissed the gorilla]]]]?

Movement of either the subject (44b) or the object (44a) to the specifiers of the CPs is acceptable. However, movement of both results in terrible ungrammaticality:

45) *[$_{CP1}$ Who$_k$ did [$_{TP}$ you wonder [$_{CP2}$ what$_i$ [$_{TP}$ t_k kissed t_i]]]]?

The central intuition underlying an account of these facts is that once you move a *wh*-phrase into the specifier of a CP, then that CP becomes an island for further extraction:

46) I asked $\boxed{\text{[}_{CP}\text{ what}_i\text{ John kissed }t_i\text{]}}$ *wh*-island

Movement out of this *wh*-island results in ungrammaticality. We can express this with the following descriptive statement:

47) *Wh-island Constraint*
* wh$_i$ [… [$_{CP}$ wh$_k$ [… t_i …] …] …]

This constraint simply says that you cannot do *wh*-movement (in the schematic in (47) this is represented by the wh$_i$ and the coindexed t_i) and skip around a CP that has another *wh*-phrase (wh$_k$) in its specifier. We're going to discuss this particular island in much greater detail in the next section.

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[2] If you have trouble with this judgment, try stressing the word *what* in (41) and *how* in (42).

Subjects are another kind of island. Consider the following sentence; it has a CP in its subject position (48a). When you try to *wh*-move the *wh*-equivalent to *several rioters* (*who* in 48b), the sentence becomes ungrammatical.

48) a) [$_{TP}$ [$_{CP}$ That the police would arrest several rioters] was a certainty].
b) *Who$_i$ was [$_{TP}$ [$_{CP}$ that the police would arrest t_i] t_{was} a certainty]?

This is called the ***subject condition***:

49) *The Subject Condition*.
*wh$_i$ … [$_{TP}$ [$_{CP}$ … t$_i$ …] T …]

We have one final island to consider. Consider a conjunction like that in (50a). Here we have two DPs conjoined with each other. *Wh*-moving either of these DPs results in ungrammaticality (50 b and c).

50) a) I liked Mary and John.
b) *Who$_i$ did you like Mary and t_i?
c) *Who$_i$ did you like t_i and John?

The same is true if you try to do *wh*-movement from within another structure that is conjoined, such as a conjoined VP in (51):

51) a) I [$_{VP}$ ate some popcorn] and [$_{VP}$ drank some soda].
b) *What$_i$ did you eat t_i and drink some soda?
c) *What$_i$ did you eat some popcorn and drink t_i?

The island condition that governs these situations is called the ***Coordinate Structure Constraint***:

52) *Coordinate Structure Constraint*:
*wh$_i$ … [$_{XP}$ [$_{XP}$ … t_i …] conj [$_{XP}$ …]] …
or *wh$_i$ … [$_{XP}$ [$_{XP}$ …] conj [$_{XP}$ … t_i …]] …
or *wh$_i$ … [$_{XP}$ [$_{XP}$ …] conj t_i] …
or *wh$_i$ … [$_{XP}$ t_i conj [$_{XP}$ …]] …

We thus have four environments out of which *wh*-movement cannot occur: Complex DPs, Subjects, CPs with a *wh*-word in their specifier and out of a conjunct in a coordination. These environments are the subject of much research in syntactic theory right now. In the next section, we will look at one possible explanation for some of these island effects (although the account does not account for all of them by any means). This account refers to a constraint known as the Minimal Link Condition.

3. THE MINIMAL LINK CONDITION

3.1 Wh-*islands and the Minimal Link Condition*

Island phenomena beg for explanation. Let's consider *wh*-islands in some detail. As we noticed above, in questions with multiple *wh*-phrases, the movement of each *wh*-phrase is allowed independently of each other:

53) a) I wonder [$_{CP}$ what$_i$ [$_{TP}$ John kissed t_i]].
b) [$_{CP}$ Who$_k$ did [$_{TP}$ you think [$_{TP}$ t_k kissed the gorilla]]]]?

However, when you combine the movements the sentence becomes nearly incomprehensible:

54) *[$_{CP1}$ Who$_k$ did [$_{TP}$ you wonder [$_{CP2}$ what$_i$ [$_{TP}$ t_k kissed t_i]]]]?

Recall from earlier discussion that syntactic operations like to either be local (for example, anaphors must be bound within their clause – a local relation; similarly theta-roles are assigned within their VP – another local relation) or create localities (for example, DPs move to get close or local to their case assigner; affixes move to get close or adjacent to their host; and *wh*-phrases move to get near a [+WH]). In the next chapter, we will consider a unified approach to movement that tries to capture at least the last set of cases. What is important here is that our grammars seem to like relations that are close. With this intuition in mind, think about *wh*-islands. *Wh*-phrases move to get in the specifier of a C$_{[+WH]}$ so let's hypothesize that there is a further restriction, movement must always target the nearest *potential* position. This is another locality condition: the Minimal Link Condition (MLC):

55) *Minimal Link Condition (MLC) (intuitive version)*
Move to the closest potential landing site.

In (54) there are two CPs, but both the *wh*-phrases start in the embedded clause. This means that for both *wh*-phrases the embedded CP (CP2) is the closest potential landing site. Here's an abbreviated D-structure of (54), the potential landing sites for the wh-phrase are underlined:

56) [$_{CP1}$ __ C$_{[+WH]}$ [$_{TP}$ you Ø$_{[PRES]}$ wonder [$_{CP2}$ __ C$_{[+wh]}$ [$_{TP}$ who -ed kiss what]]]]?

If we start by moving *what* to this position, we can check off *what*'s *wh*-feature, and this move meets the minimal link condition because the movement has targeted the closest potential landing site:

57) [$_{CP1}$ __ C$_{[+WH]}$ [$_{TP}$ you Ø$_{[PRES]}$ wonder [$_{CP2}$ what$_k$ C$_{[\checkmark wh]}$ [$_{TP}$ who -ed kiss t_k]]]]?

Now the other *wh*-phrase in this sentence has to check[3] its *wh*-features, but the closest potential position is filled by *what*. While movement to the specifier of CP1 would allow it to check its [+WH] feature, this would be a violation of the MLC, as the movement skips the first potential position:

58) [$_{CP1}$ __ $C_{[+WH]}$ [$_{TP}$ you $Ø_{[PRES]}$ wonder [$_{CP2}$ what$_k$ $C_{[✓wh]}$ [$_{TP}$ who -ed kiss t_k]]]]?

**first potential position*

Even though the specifier of CP2 is filled with *what*, it still counts as the closest position. But since it is occupied, *who* can't move there, so there is no way for the [+WH] feature to be checked. Notice that it doesn't matter what order we apply the operations in. If we move *who* first, stopping off in the specifier of CP2 (thus meeting the MLC), then that specifier is occupied by the trace, so there is no place for the what to move to:

59) [$_{CP1}$ who$_i$ $C_{[+WH]}$ [$_{TP}$ you $Ø_{[PRES]}$ wonder [$_{CP2}$ t_i $C_{[✓wh]}$ [$_{TP}$ t_i -ed kiss what]]]]?

?

The MLC thus explains the ungrammaticality of *wh*-islands: When you have multiple *wh*-phrases that require movement, movement of at least one of them will be blocked by the MLC because the closest potential landing site will be occupied by the other.

Before moving on to look at the utility of the MLC in other domains, it's worth noting how the grammaticality of a sentence like (60) is derived when we have a constraint like the MLC. This sentence looks like we have non-local movement. The word *who* gets its theta role in the embedded clause yet ends up in the specifier of the higher CP:

60) [$_{CP}$ Who$_i$ do you think [$_{CP2}$ [$_{TP}$ t_i kissed the gorilla]]]?

This should be a violation of the MLC, since the wh-phrase ends up in the specifier of a CP that is higher up in the tree. You will recall from the tree in (29) that we said that *wh*-movement that crosses clause boundaries does so in two hops: First to the specifier of the lower CP, then on to the higher CP.

61) [$_{CP}$ Who$_i$ do you think [$_{CP2}$ t_i [$_{TP}$ t_i kissed the gorilla]]]?

[3] We return to sentences like *I wonder who loves what* where there appears to be no movement in section 4.

We now have an explanation for why this is the case: The MLC requires that all movement be local. In order to maintain this locality the movement happens in two hops. This phenomenon is called *successive cyclic movement*. In the problem sets section of this chapter there is a question on Irish (General Problem Set 6) that shows a morphological correspondence to successive cyclic movement.

You now have enough information to try General Problem Sets 5 & 6 and Challenge Problem Sets 2 & 3

It should be noted before we go on that the MLC does not explain all island effects, only the *wh*-islands, but this is a hot topic of research in syntax today.

3.2 The MLC in DP Movement and Head Movement

The MLC has usage above and beyond that of *wh*-islands. We can use it to account for a variety of other locality effects with DP and head movement too.

The verbs *is likely* and *seem* both have empty subject positions and allow the subject-to-subject raising variant of DP movement.

62) a) Mark_i is likely [t_i to have left].
    b) Mark_i seems [t_i to have left].

Consider now what happens when you embed one of these in the other. It is only possible for DP movement to occur to the *lower* of the two case positions. (63a) shows the D-structure. (63b) shows the grammatical S-structure where the DP shifts to the lower position, and expletive insertion applies at the higher position. (63c) and (63d) show ungrammatical forms, where the DP has shifted to the higher of the two positions. This kind of movement is ungrammatical, whether or not (63d vs. 63c) expletive insertion applies in the lower specifier of TP.

63) a) __ seems [that ___ is likely [Mark to have left]].
    b) It seems [that Mark_i is likely [t_i to have left]].
    c) *Mark_i seems that is likely [t_i to have left].
    d) *Mark_i seems that it is likely [t_i to have left].

When two Case positions are available movement has to target the closer (lower) one. The MLC condition explains these facts as well.

64) *[$_{TP}$ Mark$_i$ seems that [$_{TP}$ it is likely [t$_i$ to have left]]].

first potential nominative position

Sentences (63 c and d) are ungrammatical because the movement goes beyond the closest potential position, which is occupied by an expletive into a higher position. It is as if the expletive creates a "case-island" for the purposes of DP movement.

A similar effect is seen in head-movement. Recall from chapter 9 that in French we have both T → C movement and V → T movement. These two operations had to happen in tandem if we have a yes/no question with a main verb and no auxiliary:

65) a) [$_{CP}$ C$_{[+Q]}$ [$_{TP}$ vous T$_{[pres]}$ [$_{VP}$ *t$_{vous}$* mangez des pommes]]]
you eat of.the apples

b) [$_{CP}$ C$_{[+Q]}$ [$_{TP}$ vous T$_{[pres]}$ [$_{VP}$ *t$_{vous}$* mangez des pommes]]]
T → C V → T

c) Mangez vous des pommes?
"Do you eat apples?"

(65a) is roughly the D-structure of the sentence (with the subject DP moved from the specifier of TP for case). We have two instances of head-movement (65b). First V → T applies, then T → C to give the C content, this results in the surface string in (65c). Consider what would happen if the intermediate T position were occupied by an auxiliary (66a) and we tried to do head-movement of the verb around it (66b), this would give us the ungrammatical string in (66c):[4]

66) a) [$_{CP}$ C$_{[+Q]}$ [$_{TP}$ vous avez [$_{VP}$ *t$_{vous}$* mangé des pommes]]]
you have eaten of.the apples

b) [$_{CP}$ C$_{[+Q]}$ [$_{TP}$ vous avez [$_{VP}$ *t$_{vous}$* mangé des pommes]]]

first potential position

[4] For ease of reading these diagrams I'm leaving out the stacked verb analysis of auxiliary constructions and just generating auxiliaries in T; this does not change the MLC effect.

c) *Mangé vous avez des pommes
eaten you have

The ungrammaticality of (66c) follows easily, the V → C movement has skipped the intermediate T (occupied by *avez*). This T position is the first potential landing site for the verb. This is thus a violation of the Minimal Link Condition.[5]

You now have enough information to try Challenge Problem Set 4

The MLC then doesn't only explain *wh*-islands, it also extends to other locality restrictions on movement, such as the requirement that DP movement always target the closest case position and the requirement that head-movement not skip intervening heads. Notice that in each of these cases what counts as a "potential landing site" is different. The same basic constraint holds, but the conditions for each type of movement are different. This discovery was made by Luigi Rizzi in his famous book *Relativized Minimality* (1990). There are two things that are vague about our preliminary definition of the MLC above: the precise definition of "closest" and the precise definition of "potential landing site." Nevertheless for most people our preliminary definition should be intuitive and sufficient. For people who prefer more precision here is a definition that is more formal and defines closest in terms of c-command and relativizes the landing site to the type of movement:

67) *The Minimal Link Condition (formal)*
Movement of some item β can target some position α of type δ if and only if
i) α c-commands β
ii) there is no γ, also of type δ, such that α c-commands γ, and γ c-commands β.
iii) δ is defined as:
(a) a head if β = a head.
(b) The specifier of TP if β = a DP with an unchecked [NOM].
(c) The complement of the V if β = a DP with an unchecked [ACC].
(d) The specifier of CP if β = *wh*-phrase with an unchecked [+WH] feature.

Conditions (i) and (ii) of this version of the MLC firm up what is meant by "closest." Here closeness is defined in terms of c-command, where there can

[5] This instance of the MLC is sometimes known by an older name: The Head Movement Constraint (HMC), which was invented by Travis (1984); the HMC was the inspiration behind the MLC.

be no intermediate c-commanding landing site of the relevant type intervening between the item that's moving and it's landing site. The way that this is defined is actually nearly identical to the definition of ***government*** given way back in chapter 4. In fact, the MLC is often assumed to be the successor to the government relation[6]. Condition (iii) defines the kind or type of landing site relative to each type of movement.

4. ECHO QUESTIONS (*WH*-IN-SITU) IN ENGLISH

You may have noticed in the previous section that the MLC, when applied to *wh*-movement, in essence prevents any clause from having two moved *wh*-phrases. Does this mean that a clause can't have two *wh*-phrases at all? Obviously not:

68) Who loves who(m)?

This sentence is grammatical, even though the second *wh*-phrase does not move. This is a phenomenon called *wh*-in-situ (from the Latin *in situ* "in place"). We also see *wh*-in-situ in sentences with only one *wh*-phrase:

69) Shelly loves who? (If this is not grammatical for you, stress *who*.)

We might ask why the *wh*-phrase in (69) and the second *who* in (68) don't move to check their [+WH] features. The answer is simple, these are not *wh*-questions and these apparent *wh*-phrases are [–WH]. These are ***echo-questions***. Echo questions are not requests for new information; instead they are requests for confirmation of something someone has heard. Consider sentence (68) in a conversational context:

70) *Daniel*: Hey, I just heard that Shelly loves Ferdinand.
Andrew: Shelly loves who?
Daniel: You heard me, Shelly loves Ferdinand.

It's clear from this snippet of discussion that Andrew is incredulous about Shelly loving Ferdinand and was asking for confirmation of what he heard. This is very different from a request for information. There are two relevant properties of echo-questions (i) they don't involve movement, but (ii) they do involve a special intonation, where the in-situ *wh*-phrase is stressed. Since echo questions don't involve movement, they aren't going to be subject to

[6] The term "govern" had two usages in the 1980s and early 1990s: one as a structural relation (as defined in chapter 4); the other was as a constraint on the grammar. It is this latter usage that the MLC replaces.

the MLC (explaining the grammaticality of (68) and other examples like it). While yes/no questions and *wh*-questions have some kind of syntactic licensing echo questions seem to be licensed by intonation and stress. In this regard they are similar to intonational questions that don't have subject/aux inversion such as (71) (where the rising curve is meant to indicate raised intonation and the italics represent stress on the words):

71)

Fred saw a spaceship in *the linguistics lounge*?

Note that this question again has a subtly different meaning from the one with subject/aux inversion and *do*-support (*Did Fred see a space ship in the linguistics lounge?*). The sentence with subject/aux inversion is a request for information. (71) is an expression of doubt and a request for confirmation.[7] How such phonological licensing is encoded into the syntactic tree is very controversial. One solution is that, like *wh*-questions and yes/no questions, echo questions and intonational questions involve a special complementizer. We can indicate this as $C_{[+INT]}$. The [+INT] feature doesn't trigger any movements, but it instructs the phonology to put a rising intonation curve on the clause that follows the C. The stress has to do with contrastive focus. In English contrastively focused material is stressed.

Wh-in-situ in English (and in closely related languages) seems to be largely limited to echo-question contexts.[8] However, *wh*-in-situ is the norm for real *wh*-questions in languages such as Chinese and Japanese. These languages appear to have no *wh*-movement at all. This will be a major topic of the next chapter.

5. CONCLUSION

In this chapter, we looked at a third kind of movement transformation: *Wh*-movement. This process targets *wh*-phrases and moves them to the specifier

[7] In fact, many people distinguish these using special punctuation in emails and informal writing. A yes/no question is indicated with a simple question mark (?), but an echo or intonational question is usually indicated with a combination of two (or more) question marks with an exclamation mark in between (?!?).

[8] There are contexts however, which involve a multiple wh-question interpretation. For example, a police officer might ask a suspect *"When did you convince your accomplice to hide the money where?"* or a parent might ask a teenager *"Who were you with where?"*. These kinds of in-situ questions will receive the same treatment as in-situ *wh*-questions in languages such as Japanese and Chinese to be discussed in the next chapter.

of CPs. This movement is triggered by the presence of a [+WH] feature in C. Movement is always from a Case position to the specifier of CP. *Wh*-movement is not totally unrestricted; there is a locality constraint on the movement: the MLC. Movement must be local, where local is defined in terms of closest potential landing site. We saw further that the MLC might be extended to other types of movement.

In the next chapter, we're going to continue this trend and look at movement processes in general and the similarities between them, as well as briefly delve into the interaction between the syntax and the formal interpretation (semantics) of the sentence.

IDEAS, RULES, AND CONSTRAINTS INTRODUCED IN THIS CHAPTER

i) **Wh-*movement***: Move a *wh*-phrase to the specifier of CP to check a *wh*-feature in C.

ii) **That-*trace Filter*** *(English only)*: * *That* trace_{wh}

iii) ***Island***: A phrase that contains (dominates) the *wh*-phrase, and that you may not move out of.

iv) ***The Complex DP Constraint***: *wh_i [… [$_{DP}$ … t_i …] …]

v) ***Wh-island Constraint***: * wh_i [… [$_{CP}$ wh_k [… t_i …] …] …]

vi) ***The Subject Condition***: *wh_i … [$_{TP}$ [$_{CP}$ … t_i …] T …]

vii) ***Coordinate Structure Constraint***:
*wh_i … [$_{XP}$ [$_{XP}$ … t_i …] conj [$_{XP}$ …]] …
or *wh_i … [$_{XP}$ [$_{XP}$ …] conj [$_{XP}$ … t_i …]] …
or *wh_i … [$_{XP}$ [$_{XP}$ …] conj t_i] …
or *wh_i … [$_{XP}$ t_i conj [$_{XP}$ …]] …

viii) ***Minimal Link Condition (MLC)*** *(intuitive version)*: Move to the closest potential landing site.

ix) ***The Minimal Link Condition (formal)***:
Movement of some item β can target some position α of type δ if and only if
i) α c-commands β
ii) there is no γ, also of type δ, such that α c-commands γ, and γ c-commands β.
iii) δ is defined as

(a) a head if β = a head
(b) The specifier of TP if β = a DP with an unchecked [NOM].
(c) The complement of the V if β = a DP with an unchecked [ACC].
(d) The specifier of CP if β = *wh*-phrase with an unchecked [+WH] feature.

x) **Wh-*in-situ***: when a *wh*-phrase does not move.

xi) ***Echo-Questions and Intonational Questions***: Question forms that are licensed by the phonology (intonation and stress) and not by the syntax, although they may involve a special C.

FURTHER READING

Baltin, Mark (1981) Strict bounding. In C. L. Baker and John McCarthy (eds.) *The Logical Problem of Language Acquisition*. Cambridge: MIT Press. pp. 257–95.

Cheng, Lisa (1997) *On the Typology of Wh-Questions*. New York: Garland Press.

Chomsky, Noam (1977) On *wh*-movement. In Peter Culicover, Thomas Wasow, and Adrian Akmajian (eds.), *Formal Syntax*. New York: Academic Press. pp. 71–132.

Chomsky, Noam (1986a) *Barriers*. Cambridge: MIT Press.

Chomsky, Noam and Howard Lasnik (1978) A remark on contraction. *Linguistic Inquiry* 9, 268–74.

Cinque, Guglielmo (1981) *Types of A' Dependencies*. Cambridge: MIT Press.

Koopman, Hilda (1984) *The Syntax of Verbs*. Dordrecht: Foris.

Lasnik, Howard and Mamoru Saito (1984) On the nature of proper government. *Linguistic Inquiry* 15, 235–89.

Lightfoot, David (1976) Trace theory and twice moved NPs. *Linguistic Inquiry* 7, 559–82.

Manzini, Maria Rita (1992) *Locality: A Theory and Some of its Empirical Consequences*. Cambridge: MIT Press.

Richards, Norvin (1997) What Moves Where When in Which Language? Ph.D. dissertation, MIT.

Rizzi, Luigi (1990) *Relativized Minimality*. Cambridge: MIT Press.

Ross, J. R. (Haj) (1967) Constraints on Variables in Syntax. Ph.D. dissertation, MIT.

Travis, Lisa deMena (1984) Parameters and Effects of Word Order Variation. Ph.D. Dissertation, MIT.

GENERAL PROBLEM SETS

1. ENGLISH MOVEMENT SENTENCES

[Application of Skills; Basic to Advanced]

For each of the following sentences, give the D-structure tree and annotate it with arrows indicating what transformations have applied. The sentences may have head-to-head movement, *do*-insertion, expletive insertion, DP movement and *wh*-movement.

a) What is bothering you?
b) Who has seen my snorkel?
c) How was the plot discovered by the authorities?
d) Which animals appear to have lost their collars?
e) What did Jean think was likely to have been stolen?
f) Car sales have surprised the stockbrokers.
g) Have you seen my model airplane collection?
h) Can you find the lightbulb store?
i) John was bitten by an advertising executive.
j) It is likely that Tami will leave New York.
k) Tami is likely to leave New York.
l) It seems that Susy was mugged.
m) Susy seems to have been mugged.
n) What did you buy at the supermarket?
o) I asked what Beth bought at the supermarket.
p) What is it likely for Beth to have bought at the supermarket?
(Treat the PP *for Beth* as appearing the specifier of the embedded TP.)
q) What is likely to have been bought at the supermarket?

2. BINDING THEORY

[Critical Thinking; Basic]

In chapter 5, you were asked why the sentence below causes a problem for the binding theory. Remind yourself of your answer, and then explain how the model of grammar we have proposed in this chapter accounts for this fact.

Which pictures of himself does John despise?

3. BINDING AND SCRAMBLING[9]

[Critical Thinking; Intermediate/Advanced]

You should complete Problem Set 2 before attempting this problem set.

Modern Persian has a kind of movement often called ***scrambling***. Your task in this problem set is to figure out whether scrambling is DP movement, head-to-head movement or *wh*-movement. The Persian word *hamdiga* means "each other" and is an anaphor. Assume that anaphors are subject to the binding theory of chapter 4, and that they must be in argument positions to be bound. Sentence (a) shows the basic order. Sentences (b) and (c) show the surface word order after scrambling has applied. The scrambled sentences mean almost exactly the same thing as (a). HAB stands for "habitual." Recall that $_{i/*k}$ means that the sentence is okay with the DP having the index $_i$ but not with the index $_k$.

a) Mo'allem-â$_k$ fekr mi-kon-an [$_{CP}$ ke [$_{T'}$ [$_{vP}$ bachche-hâ$_i$
teacher-PL thought HAB-do-3PL that child-PL

[$_{VP}$ aks - â -ye hamdiga$_{i/*k}$ - ro be modir neshun dâd-an]]]].
picture-PL-EZ each other - RÂ to principal sign gave-3PL

"The teachers$_k$ think that the children$_i$ showed [each other's]$_{i/*k}$ pictures to the principal."

b) Mo'allem-â$_k$ [aks-â-ye hamdiga$_{i/*k}$-ro]$_m$ fekr mi-kon-an [$_{CP}$ ke [$_{T'}$ [$_{vP}$ [bachche-hâ$_i$] [$_{VP}$ t$_m$ be modir neshun dâd-an]]]].

c) [Aks-â-ye hamdiga$_{i/*k}$-ro]$_m$ mo'allem-â$_j$ fekr mi-kon-an [$_{CP}$ ke [$_{T'}$ [$_{vP}$ bachche-hâ$_i$ [$_{VP}$ t$_m$ be modir neshun dâd-an]]]].

4. PICTURE DPS

[Critical Thinking; Intermediate/Advanced]

Why is the grammaticality of the following sentence surprising? Does the theory we have presented in this chapter predict this to be acceptable? What constraint should this sentence violate.

Who(m) did you see a picture of?

5. LOCALITY

[Data Analysis; Basic]

Why is the following sentence ungrammatical?

*Who$_j$ did [$_{TP}$ George try to find out [$_{CP}$ what$_i$ [$_{TP}$ t$_j$ wanted t$_i$]]]?

[9] This problem set was contributed by Simin Karimi.

Draw a tree showing the exact problem with this sentence. Be precise about what constraint rules it out.

6. IRISH[10]

[Data Analysis; Advanced]

Irish has a number of different complementizer forms. In declarative clauses (statements), it uses the complementizer *go/gur*. As discussed in the text above, when there is a question, this complementizer switches to the *wh* form a^L. (The idea behind this problem set is taken from McCloskey 1979.)

a) Ceapann tú go bhuailfidh an píobaire an t-amhrán
think you that play.FUT the piper the song
"You think that the piper will play the song."

b) Caidé a^L cheapann tú a^L bhuailfidh an píobaire?
What WH think you WH play.FUT the piper
"What do you think the piper will play?"

Note carefully the number of a^L complementizers in sentence (b). (b) provides evidence that *wh*-phrases stop off in intermediate specifiers of CP (for MLC reasons). Explain why. You need to make the assumption that the complementizer a^L only shows up when a *wh*-phrase has at one point shown up in its specifier.

CHALLENGE PROBLEM SETS

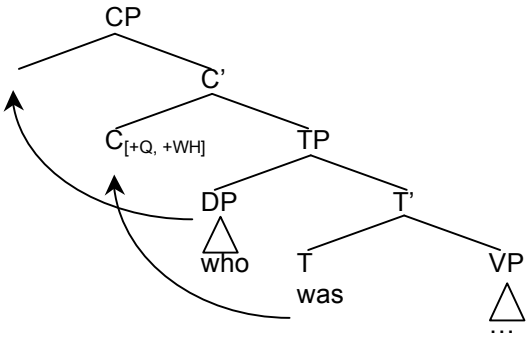
CHALLENGE PROBLEM SET 1: WHO ATE THE PIZZA?

[Critical Thinking; Challenge]

In the text we suggested that subject questions involving an auxiliary have vacuous movement of both the *wh*-phrase (to the specifier of CP) and the auxiliary (to $C_{[+Q,\ +WH]}$), even though that leaves the subject *wh*-phrase and auxiliary in the same order they'd be in if they'd stayed in the TP:

[10] This problem set was suggested by an anonymous Blackwell reviewer.

a)



We suggested this was the case so that we could maintain the feature checking requirements hold here too.

Consider however the following sentence. Notice that the tense morphology is not realized as *did*, but on the main verb *ate*.

b) Who ate the pizza?

Question 1: Explain why this is an argument against the vacuous movement shown in (a).

Question 2: If there is no vacuous movement, what then are we to make of the complementizer in subject questions? Is it [+Q, +WH]? Is there some way to explain why the complementizers with subject *wh*-questions are different than complementizers with object and adjunct wh-questions (which do show both *wh*-movement and T → C movement)?

CHALLENGE PROBLEM SET 2: IRISH

[Data Analysis; Challenge]

Some dialects of English allow a kind of *wh*-construction, where the base position of the *wh*-phrase is filled by a ***resumptive pronoun*** (the idea behind this problem set is taken from McCloskey 1991):

This is the book$_i$ that the police are arresting everyone who reads it$_i$.

In Modern Irish, this kind of construction is very common. Modern Irish has two different *wh*-complementizers (notice that these are <u>*not*</u> *wh*-phrases, which go in the specifier of CP, these are complementizers): a^L, a^N. The complementizer a^L is found in sentences like (a). Sentence (i) shows a simple sentence without *wh*-movement using the non-*wh*-complementizer *go*. Sentences (ii) and (iii) show two possible forms of the question. (ii) has the question moved only to an intermediate CP specifier. (iii) has the *wh*-phrase moved to the topmost specifier.

a) i) Bíonn fios agat i gconaí [$_{CP}$ **go** bhuailfidh an píobaire an t-amhrán].
be.HAB know at.2.S always that play.FUT the piper the song
"You always know that the bagpiper will play the song."

ii) Bíonn fios agat i gconaí [$_{CP}$ caidé$_i$ **a^L** bhuailfidh an píobaire t_i].
be.HAB know at.2.S always what$_i$ COMP play.FUT the piper t_i
"You always know what the bagpiper will play."

iii) [$_{CP}$ Cáidé$_i$ **a^L** [$_{TP}$ bhíonn fios agat i gconaí [$_{CP}$ t_i **a^L** bhuailfidh an píobaire t_i]]]?
What COMP be.HAB know at.2.S always t_j COMP play.FUT the piper t_i
"What do you always know the piper will play?"

Now the distribution of the complementizer a^N seems to be linked to the presence of a resumptive pronoun. Consider the (ii) sentences in (b) and (c). Both show resumptive pronouns and the complementizer a^N:

b) i) Bíonn fios agat i gconaí [$_{CP}$ caidé$_i$ **a^L** bhuailfidh an píobaire t_i].
be.HAB know at.2.S always what$_i$ COMP play.FUT the piper t_i
"You always know what the bagpiper will play."

ii) [$_{CP}$Cén Píobaire$_j$ ***a^N*** [$_{TP}$ mbíonn fios agat i gconaí [$_{CP}$caidé$_i$ **a^L** bhuailfidh ***sé$_j$*** t$_i$]]]?
Which piper COMP be.HAB know at.2.S always what$_i$ COMP play.FUT he
"Which bagpiper do you always know what he will play?"

c) i) Tá máthair an fhir san otharlann.
Be.PRES mother the man.GEN in.the hospital
"The man's mother is in the hospital."

ii) Cé$_i$ ***a^N*** bhfuil ***a$_i$*** mháthair san otharlann?
who COMP be.PRES his mother in.the hospital
"Who is (his) mother in the hospital?"

The a^N complementizer and the resumptive pronouns are boldfaced in the above examples. Where precisely does the a^N-resumptive strategy appear? In what syntactic environment do you get this construction?

CHALLENGE PROBLEM SET 3: SERBIAN/CROATIAN/BOSNIAN[11]

[Critical Thinking; Challenge]

In this chapter, we have proposed that a *wh*-phrase appears in the specifier of CP, to check a [WH] feature. Our analysis of locality conditions requires that only one *wh*-phrase can appear in the specifier of CP. Consider the following data from Serbian/Croatian/Bosnian. Assume that this language is SVO at D-structure. (Data from Bošković 1997 as cited in Lasnik 1999a.)

a) Ko šta gdje kupuje?
   who what where buys
   "Who buys what where?"
b) *Ko kupuje šta gdje?
c) *Ko šta kupuje gdje?
d) *Ko gdje kupuje šta?

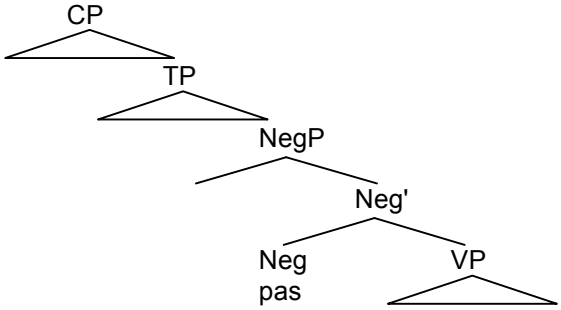
What problems does this data raise for our analysis? Can you see a way around these problems?

CHALLENGE PROBLEM SET 4: FRENCH NEGATION

[Critical Thinking; Challenge]

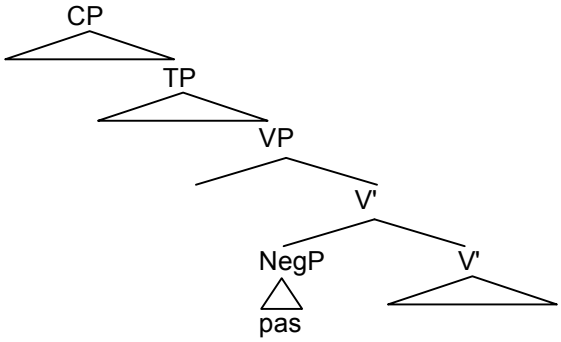
We've argued that in French the verb raises to T, and that T raises to C in yes/no questions. Further in this chapter, we've argued that head movement is subject to the Minimal Link Condition. In previous chapters we've treated the French word *pas* as the head of NegP as in (a). Consider an alternative where *pas* isn't the specifier of NegP but is an adjunct to the VP as in (b):

a)



[11] This problem set was contributed by Simin Karimi.

b)



Keep in mind the restriction in the MLC that the moving element can't skip potential landing sites that c-command it. Recall that V → T movement jumps over the word *pas*:

c) Je n'aime pas t_V des pommes.
I like not of.the apples.
"I don't like apples"

Does this argue for the analysis in (a) or the analysis in (b)? Explain your answer.