Wh-movement and Locality Constraints

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After this lecture, you have mastered the following ideas and skills:

• Explain the motivation for wh-movement
• Draw the tree indicating wh-movement
• Identify various complementizer types
• Draw a tree for a relative clause
• Identify island types
Movement Rules

• We’ve seen that DPs move from the position where they got their theta role to a position where they could get Case.

• We saw that the trigger for this movement was the requirement that DPs check their Case feature.
Movement Rules

• Case, as we saw, can only be assigned in specific structural positions.

• In this lecture, we’re going to discuss another kind of phrasal movement, one where DPs already have Case.

• We will see that DPs can move for a different reason: to form what are called Wh-questions.
Types of Questions

• There are several different types of questions, but we’ll be concerned with only two of them: *Yes/no questions* and *wh-questions*. 
Yes/no Questions

• Yes/no questions include the following:

1) a) Are you going to eat the bagel?
   b) Do you drink whisky?
   c) Have you seen the spectrograph for the phoneme?
Yes/no Questions

• We saw that yes/no questions in English are formed by moving T to an empty [+Q] as shown in the tree below:
Yes/no questions
Yes/no questions

• The derivation of (1a) will be as follows.
• We will start with the D-structure in (2c):
3) CP
   C'
   C
   Ø[+Q] DP
   T
   TP
   T'
   VP
   Ø
   V
   have
   V'
   V
   VP
   have
   V
   VP
   V'
   V
   VP
   seen
   DP
   you
   seen
   the syntax book
Wh-questions

• Now, we will turn our attention to how wh-questions are formed.
• Consider the following statement and question pair:
  3) a. Becky bought the syntax book.
     b. What did Becky buy?
• The verb *buy* takes two theta roles, an external agent and an internal theme.
• In (3a) *Becky* is the agent and *the syntax book* is the theme.

• In (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 sentence the theme is at the beginning of the clause.
The situation becomes more complex when we look at sentences like (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.
• The situation becomes murkier still when consider Case.
• Remember that accusative Case is assigned when the DP is the sister to V:
• 5) Matt \([_{VP} \text{kissed her}_{ACC}]\)
• But in wh-questions the accusative form *whom* is not a sister to V:
• 6) Whom\textsubscript{ACC} did Matt kiss?
• So it appears as if not only are these wh-questions not in their theta positions, but they aren’t in their Case positions either.
• This looks like another case of movement, but this time with different triggers.
• First, let’s consider the issue of where wh-phrases move to.
• One position we have had for a while but have not yet used is the specifier of CP.
• This is where wh-phrases move to:
Notice that what moves here is the entire phrase. This can be seen in complex wh-questions like the following:

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, so this is movement to a position other than a head, in this case the empty specifier of CP.
• The element that is moved can be a DP, a PP, an AdjP or and AdvP.
• The movement to specifier of CP accounts for another fact about 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:
• The fact that wh-movement is to thespecifier of CP position can also be seen in languages that allow both wh-phrase and an overt complementizer, such as Irish:
• 1 1) Cad a\textsuperscript{1} ta sa seomra

What C-\textit{wh} is \textit{in.the room}

“What is in the room?”
• In Irish, the wh-phrase *cad* “what” appears to the left of the complementizer *aL*, supporting the idea that the wh-phrase is in specifier of CP, the only position available to it.
• In English the only thing allowed to appear in C is an inverted auxiliary; complementizers are not allowed:

• a. *I asked what that she kissed?
• b. *I asked what whether she kissed?
• This follows from the assumption that the only complementizer that is compatible with wh-movement in English is null.

• In other languages, the complementizer has phonological content (e.g. Irish $a^L$ or Bavarian German $dass$).
• What then, is the possible triggers/motivations for wh-movement?
• a) We have seen that T→C is triggered by the [+Q] feature that is part of the complementizer.
• b) DP movement was triggered by a Case feature.
• We can do the same for wh-questions, by proposing a feature that triggers wh-movement.
• We shall call this feature [+WH]. It resides in the C of a wh-sentence.
• In some languages like Irish, there are special forms of complementizers that represent these features:
  • [-Q, -WH] go
  • [+Q, -WH] an
  • [+Q, +WH] aL
• The *go* complementizer is used when the sentence is not a *yes/no* or *wh*-question.

• The *an* complementizer is found in *yes/no questions* and $a^L$ in *Wh*-questions.

• The form of the complementizer is dependent upon the features it contains (McCloskey 1979).
• We will assume that a wh-phrase moves to specifier of CP to be near the [+WH] feature.

• Another way to put it is 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.
• 15) *Wh-movement*

• Move a wh-phrase to the specifier of CP to check a [+WH] feature in C.

• Here is the derivation of a sentence like:

• 16) Who(m) did Matt kiss?
• The D-structure of this sentence will look like (17). *Matt* and *whom* both get their theta roles in these D-structure positions.

• *Who(m)* also gets its Case in this base position.
17)
• Three other operations apply to derive the sentence:
  • DP movement of *Matt* to the specifier of TP to check the [NOM] feature.
  • Insertion of *do* to support the past tense, and
  • T→C movement to fill the null [+Q] complementizer.
• Finally, Wh-movement applies to check the [+WH] feature as shown in (18):
• Let’s consider a more complicated example:
• 19) Who was kissed?
• *Who* is the only argument in the sentence (a theme) and it starts out as a complement of the verb. But because this is a passive construction, the participle *kissed* cannot check accusative Case.
• So the DP has to move to the specifier of TP to check nominative Case as in (20):
• Once the DP has checked its Case features, it can move on to the specifier of CP for the wh-feature checking as in ([A]) in (21).
• The auxiliary undergoes T→C movement ([B]) for the [+Q] feature:
• 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.
• Wh-movement can apply across clauses.
• Consider the following sentence:
  22) Who(m) do you think Jim kissed?
• Whom is theta marked by the verb kiss, and gets its internal theme theta role in the object position of that verb.
• The present tense feature on the higher T requires do-support.
• The [+Q] feature on the C triggers T→C movement.
• The DP *Jim* moves from 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.
• Finally, wh-movement takes place. The movement is done in two hops for reasons we shall discuss later.
• Let us do a derivation in which the wh-phrase stops in the specifier position of the embedded CP rather than moving all the way up:

• 24) I wonder who Jim kissed.
The main difference between this sentence and (23) lies in the nature of the main verb. In (23) the verb was *think*, that subcategorizes for a CP headed by $C_{[-Q, -WH]}$ as in (25a).

The verb *wonder* is different in that it subcategorizes for a CP headed by a $C_{[-Q, +WH]}$, that is, the embedded clause has wh-movement in it as in (25b):
25) a) *think*

<table>
<thead>
<tr>
<th>Agent</th>
<th>Proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP</td>
<td>CP([-Q, -WH])</td>
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b) *wonder*

<table>
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<tr>
<th>Agent</th>
<th>Proposition</th>
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</thead>
<tbody>
<tr>
<td>DP</td>
<td>CP([-Q, +WH])</td>
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</tbody>
</table>
• The tree for (24) is given in (26). It differs minimally from (24) 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.
• *Who* gets its Case in its base position; the two agent DPs move to their respective specifiers of TP to get Case.
• Finally, there is movement of the wh-phrase.
• 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].
Relative Clauses

• Relative clauses are closely related to wh-questions because they involve a kind of wh-movement.
• In such constructions, a CP with a wh-element in it modifies a noun/DP.
• The tree for the DP like *several people who she kissed is given* (30):
30)
• The *wh*-phrase here doesn’t serve to mark a question, but instead it links the head noun to the gap.
Islands
• Wh-movement is not entirely free. There are constraints on what categories you can move out of (the categories that contain the wh-phrase).

• Compare the two sentences in (37)?
37) a) What did Bill claim [CP that he read \( t_i \) in the syntax book]?

b) *What did Bill make [DP the claim [CP that he read \( t_i \) in the syntax book]]?
• In (37a), we see that wh-movement out of a complement clause is grammatical, but the movement out of a CP dominated by a DP is ungrammatical as in (37b).

• 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.
• Island are places you can’t get out of (without special means like a boat or a plane).
• Islands in syntax are the same. You cannot move out of an island, but you can move around within it.
• DPs are islands.
38) *What$_i$ did Bill make

$\begin{array}{l}
\text{[DP the claim [CP that he read } t_i \text{ in the syntax book]]]]?}
\end{array}$


**Complex DP Island**
• If we try to move a wh-element from a relative clause as in (39), we get the following result:

• 39) :
39) *[Which cake] did you see [DP the man [CP who baked t]] ?
• We can characterize the phenomenon with the following descriptive statement:

40) *The Complex DP Constraint:*

\*wh_i [ ... [DP ... t_i ... ] ... ]
• Another important island is the *wh-island*.
• It is possible to move a wh-phrase to the specifier of an embedded CP, if the C is [+WH] as in (41):

41) I wonder [CP what_i C[-Q, +WH] [TP John bought t_i with the $20 bill]].
• It is also possible to move a wh-phrase to the specifier of a main CP as in (42):

• 42) \([_{CP} \text{How}_k \ do \ [_{TP} \text{you \ wonder} \ [_{CP} \text{what}_i \ [_{TP} \text{John \ bought \ } t_i \ t_k]]]]\]?
• However, when we move one wh-phrase to the embedded specifier and the other to the main CP specifier, we get an ungrammatical result:

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

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• This is not a constraint on having two wh-phrases in a sentence. Two wh-phrases are perfectly acceptable in other contexts as in (44):
  
  a. How do you think John bought what?
  b. I wonder what John bought how?
• It seems that the constraint is on moving both of them.

• Movement of either the subject (45b) or the object (45a) to the specifiers of the CPs is acceptable:
45) a) I wonder \([_{CP} \text{ what}_i \mid_{TP} \text{ John kissed } t_i]\).

b) \([_{CP} \text{ Who}_k \mid_{TP} \text{ did } \mid_{TP} \text{ you think } \mid_{TP} t_k \text{ kissed the gorilla}]]\)?
• But movement of both results a terrible ungrammaticality:
46) *[CP₁ Whoₖ did [TP you wonder [CP₂ whatᵢ [TP tᵦ kissed tᵢ ]]]]]?
• The intuition underlying this account is that once you move a wh-phrase to the specifier of a CP, then that CP becomes an island for further extraction:
I asked \([_{cp \text{what}, \text{John kissed } t_i]}\)
• Movement out of this island result in ungrammaticality.

• We can express this with the following descriptive statement:

• 48) *Wh-island Constraint

• \*wh_i [CP wh_k [... t_i ...] ...] ...]
• This constraint simply says that you cannot do wh-movement (in the schematic in (48) 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.
• Subjects are another kind of island. We cannot move a wh-phrase from CP that is in subject position as shown in (49b):

49)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 called the *subject condition.*

50) *The Subject Condition*

*whi ... [TP [CP ... ti ...] T ...]
• Another island constraint is the one that prohibits the movement of a wh-phrase from a conjoined structure.
• Consider the examples in (51):
51) a) I liked Mary and John.
   b) *Who did you like Mary and $t_i$?
   c) *Who did you like $t_i$ and John?
• (51b,c) show that if we try to wh-move either of the conjoined DPs, the result is ungrammatical.

• Again if we try to do wh-movement from within another structure that is conjoined, such as a conjoined VP, the result will be ungrammatical as in *52b,c):
52) a) I [VP ate some popcorn] and [VP drank some soda].

   b) *What did you eat $t_i$ and drink some soda?

   c) *What did you eat some popcorn and drink $t_i$?
• The island constraint that governs these situations is called the *Coordinate Structure Constraint.*
Coordinate Structure Constraint:

53) Coordinate Structure Constraint:

\[ \text{wh}_i \ldots [\text{XP} [\text{XP} \ldots t_i \ldots] \text{conj} [\text{XP} \ldots]] \ldots \]

or \[ \text{wh}_i \ldots [\text{XP} [\text{XP} \ldots] \text{conj} [\text{XP} \ldots t_i \ldots]] \ldots \]

or \[ \text{wh}_i \ldots [\text{XP} [\text{XP} \ldots \text{conj} t_i] \ldots \]

or \[ \text{wh}_i \ldots [\text{XP} t_i \text{conj} [\text{XP} \ldots]] \ldots \]
• We have considered four environments out of which wh-movement cannot occur:
  • a) Complex DPs
  • b) Subjects
  • c) CPs with wh-words in their specifier
  • d) Conjuncts in coordinated structures.
Conclusion

In this lecture, we have looked at wh-movement.

It is a process that targets wh-phrases and moves them to the specifier of CPs.

This movement is triggered by the presence of a [+WH] feature in C.

Wh-movement of a DP is always from a Case position to the specifier of CP.
Acknowledgement:

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