WH-Movement

Ling 322
Read *Syntax*, Ch. 11
WH-expressions

DP
  | D'
  | D
   | who

DP
  | D'
  | D
   | what

DP
  | D'
  | D
   | what
   | book

DP
  | D'
  | D
   | which
   | book

AdvP
  | Adv'
  | Adv
   | when

AdvP
  | Adv'
  | Adv
   | where

AdvP
  | Adv'
  | Adv
   | how
What Kind of Projection are WH-questions?

● Indirect question introduced with *if* complementizer

(1) John wonders [if the committee liked his proposal].

Given that *if* is a complementizer in $C^0$, *if the committee liked his proposal* is a CP. So, the verb *wonder* subcategorizes for a CP complement.

● Indirect question introduced with a WH-phrase

(2) John wonders [which proposal the committee liked].

If *wonder* subcategorizes for a CP, an indirect WH-question is a CP.
Where is WH-phrase?

- Doubly-filled comp filter in indirect questions

(3)  
  a. * John wonders [if/that which proposal the committee liked].
  b. * John wonders [which proposal if/that the committee liked].

Does this mean that a WH-phrase and a complementizer compete for the same position?
Where is WH-phrase? (cont.)

- But the following set of data suggests that *that/if* and the WH-phrase do not compete for the same position.

(4) Middle English (Examples from PPCME, Kroch and Taylor 2000)
  a. First the behoueth to knowe *why that* suche a solitary lyf was ordeyned.
     ‘First, it behooves thee to know why such a solitary life was ordained.’
     (cmctmeli-s0.m3, 75)
  b. I wolde fayn knowe *how that* ye understonde thilke words.
     ‘I would like to know how you understand these words.’
     (cmctmeli-s0.m3, 408)
  c. I pray you tell me *what knyght that* ye be.
     ‘Please tell me what knight you are.’ (cmmalory-s0.m4, 4655)

(5) Belfast English (Henry 1995:107)
  a. I wonder *which dish that* they picked.
  b. They didn’t know *which model that* we had discussed.
Where is WH-phrase? (cont.)

(6) Naturally occurring speech of modern standard English
   a. Immediately, I saw which one that you wanted me to read.  
      (Beatrice Santorini, in conversation, Sept. 1998)
   b. Most of my colleagues were amazed how quickly that I recovered. 
      (Advertisement for Temple University Hospital, WRTI, 24 Nov. 1999)
   c. That tells you how many days that the car will be in the shop. 
      (Kroch 1989a:95,fn.4,(i))

(7) a. Bavarian
   I woass ned wer dass des toa hod.
   I know not who that that done has
   ‘I don’t know who did that.’ (Bayer 1983-4:212)

   b. Dutch
   … welk boek of hij wil lezen
   … which book if he wants read
   ‘... which book he wants to read’ (den Besten 1989:23)

We can make sense of all these data if the complementizer is in C₀, as we have assumed all along, and the WH-phrase is in [Spec, CP].
How does WH-phrase end up in [Spec,CP]?

(8) Susan wondered [which proposal the committee liked].

⇒ WH-movement to [Spec,CP]!
How does WH-phrase end up in [Spec,CP]? (cont.)

(9) Susan wondered [which proposal Kim thought that the committee liked].

⇒ Cyclic WH-movement to [Spec,CP]!
How does WH-movement Fit with the Theory?

• Theta-role assignment

(10) a. The committee liked Susan’s proposal
    b. Susan wondered [which proposal \( t_i \) the committee liked \( t_i \)].

By positing a trace of *which proposal* in the complement position of ‘liked’, we can maintain the locality in theta-role assignment.

• Case theory

(11) a. John wonders [who/whom \( t_i \) Sue believes [the president will invite \( t_i \) to the reception]].
    b. John wonders [who/*whom \( t_i \) Sue believes [\( t_i \) will invite the president]].

By positing a trace for the WH-phrase, we can say that case is checked in the trace position, again maintaining the locality of case checking.
How does WH-movement Fit with the Theory? (cont.)

• Agreement

(12) a. The chair thinks [the professors are/*is lousy at teaching].
    b. Mary wonders [which professors the chair thinks [t are/*is lousy at teaching]].

• Binding

(13) a. John believes [that Max talks to himself].
    b. I wonder [who believes [t talks to himself]].

• Ambiguity in WH-questions with an adjunct WH-phrase

(14) a. I wonder [when John said [that he would go to New York]].
    b. I wonder [when John said [that he would go to New York t]].

By positing a trace in different positions, ambiguity in interpretation can straightforwardly be represented as structural ambiguity.
What Triggers WH-Movement?

- It cannot be to check Case features.

  WH-phrases already originate in Case positions.

  The moved WH-phrases can be AdjP, PPs or AdvP as well as DPs.

(15)  
  a. I wonder \([AdjP \text{ how happy}]\) they should be. 
  b. I wonder \([AdvP \text{ how quickly}]\) John will finish the race. 
  c. I wonder \([PP \text{ in which city}]\) the meeting will take place.
What Triggers WH-Movement? (cont.)

- We will say that $C^0$ of WH-questions have [+WH] feature, and that WH-phrases must move to check this feature in Spec-Head configuration.

![Diagram showing a syntactic analysis of a sentence with WH-movement.]
Direct WH-questions

• Unlike indirect WH-questions, direct WH-questions have subject-aux inversion, in addition to WH-movement.

(16)  a. Which proposal did the committee like?
    b. How experienced should they be?
    c. How quickly will John finish the race?
    d. In which city will the meeting take place?

⇒ We need to put together T-to-C movement and WH-movement.
QUESTION: Under the account that $C^0$ contains a [+Q] and [+WH] features that drive T-to-C movement and WH-movement respectively, how can we make sense of the fact that subject-aux inversion is not allowed in indirect WH-questions?
The original position and the moved position of a WH-phrase can be far away from each other. WH-phrase move to its final destination cyclically, from [Spec,CP] to [Spec,CP]. But WH-movement is not totally unrestricted.
Islands

• *Wh*-complement

  (18)  a. John knows [which car \(i\) he should fix \(t_i\) with a wrench].
        b. * How \(i\) does John know [which car \(j\) he should fix \(t_j\) \(t_i\)]?

• Noun complement clause

  (19)  a. John made \([DP\) the claim [that the police caught the murderer of Smith]].
        b. * Who \(i\) did John make \([DP\) the claim [that the police caught \(t_i\)]?}

• Relative clause

  (20)  a. John saw \([DP\) a man [who was wearing a red hat]].
        b. * What \(i\) did John see \([DP\) a man [who was wearing \(t_i\)]?}
Islands (cont.)

- Sentential subject

  (21) a. \([CP \text{ That Katie married Tom}]\) is unbelievable.
  
  b. * \(\text{Who}_i \text{ is } [CP \text{ that Katie married } t_i] \text{ unbelievable?}\)

- Coordinate structure

  (22) a. You liked \([DP [DP \text{ Mary}]] \text{ and } [DP \text{ John}]]\).
  
  b. * \(\text{Who}_i \text{ did you like } [DP \text{ Mary and } t_i]?\)

  (23) a. You \([VP [VP \text{ ate some popcorn}]] \text{ and } [VP \text{ drank some soda}]]\).
  
  b. * \(\text{What}_i \text{ did you } [VP \text{ eat } t_i \text{ and drink some soda}]?\)
Relative Clause Formation

Relative clauses introduced with a WH-relative pronoun and WH-questions are very similar.

(24)  a.  I wonder [who lives next door].
       b.  The people [who live next door]

(25)  a.  I wonder [whom John met last night].
       b.  The woman [whom John met last night]

(26)  a.  I wonder [where John lives].
       b.  The place [where John lives]

(27)  a.  I wonder [why John left so early].
       b.  The reason [why John left so early]

(28)  a.  I wonder [when John fixed the car].
       b.  The time [when John fixed the car]
Relative Clause Formation (cont.)

- This similarity suggests that in relative clauses, the WH-relative pronoun undergoes movement to [Spec,CP] as well.

- Prediction:

  In relative clauses, WH-relative pronouns should be able to undergo long distance movement, but should not be able to move out of islands.

  If this prediction is borne out, we can conclude that WH-relative pronouns move, just like WH-phrases in WH-questions.
Long Distance Movement in Relative Clauses

(29)  a. The letter [which he was writing]
     b. The letter [which he said [that he was writing]]
     c. The letter [which she believes [that he said [that he was writing]]]
     d. The letter [which they are claiming [that she believes [that he said [that he was writing]]]]
     e. The letter [which you think [that they are claiming [that she believes [that he said [that he was writing]]]]]
Relative Clauses and Islands

• WH-relative pronoun movement out of WH-complement

(30)  

a. John knows which car he should fix with a wrench.

b. * How does John know which car he should fix?

c. __ The wrench with which ________________________________

• WH-relative pronoun movement out of noun complement clause

(31)  

a. John made the claim that the police caught the murderer of Smith.

b. * Who did John make the claim that the police caught?

c. __ The person who ________________________________

• WH-relative pronoun movement out of relative clause

(32)  

a. John saw a man who was wearing a red hat.

b. * What did John see a man who was wearing?

c. __ The hat which ________________________________
Relative Clauses and Islands (cont.)

• Relative-WH pronoun movement out of sentential subject

(33)  a. That Katie married Tom is unbelievable.
       b. * Who is that Katie married unbelievable?
       c. ___ The celebrity who ____________________________

• WH-relative pronoun movement out of coordinate structure

(34)  a. You liked Mary and John.
       b. * Who did you like Mary and t_j?
       c. ___ The person who ____________________________

(35)  a. You ate some popcorn and drank some soda.
       b. * What did you eat t_i and drink some soda?
       c. ___ The snack which ____________________________
WH-relative Pronouns Undergo WH-movement!

The diagram illustrates the syntactic structure of a sentence where a WH-relative pronoun is under WH-movement. The structure shows how the relative pronoun "whom" moves from its position in the relative clause to an earlier point in the sentence, indicating a change in subjecthood. The diagram uses standard symbols for syntactic categories: DP for determiner phrase, NP for noun phrase, CP for wh-clause, TP for temporal phrase, and VP for verb phrase. The tree representation helps in understanding the movement of the WH-element and its effects on the sentence structure.
Constraints on WH-movement

• Structure preserving

Head categories can only move to a head position, and a maximal projection can only move to a maximal projection position.

In other words, movements must be consistent with the principles of X’-theory.

(36) * Will which car John fix?
Constraints on WH-movement (cont.)

- *that*-trace filter

A \textit{wh}-phrase cannot be extracted from a subject position that is followed by an overt complementizer.

(37) a. * \([CP \ \text{Who}_i \ \text{do you think} \ [CP \ t_i \ \text{that} \ [TP \ t_i \ \text{will win the game}]]]?)$

b. \([CP \ \text{Who}_i \ \text{do you think} \ [CP \ t_i \ [TP \ t_i \ \text{will win the game}]]]?)$
Constraints on WH-movement (cont.)

- Successive cyclicity

(38)  a.  \(* \left[ TP \ \text{John}_{i} \text{ is likely that} \left[ TP \ \text{it will appear} \left[ TP \ t_{i} \text{ to be ill} \right] \right] \right]\).

b.  \(* \left[ CP \ \text{How}_{i} \text{ does John know} \left[ CP \ \text{which car}_{j} \text{ he should fix} \right] t_{j} t_{i} \right] \)?
Minimal Link Condition (MLC)

Intuitive definition of MLC: Move to the closest potential landing site.

Violation of MLC results in ungrammaticality.

- MLC in DP movement: Move to the closest c-commanding [Spec,TP] position.

  \[(39) \quad \ast [_{TP} \text{John}_i \text{ is likely that } _{TP} \text{it will appear } _{TP} \text{t}_i \text{ to be ill}]]]]] \]


  \[(40) \quad \ast [_{CP} \text{How}_i \text{ does John know } _{CP} \text{which car}_j \text{ he should fix } _j \text{t}_i]]] \]

- MLC in head-to-head movement: Move to the closest c-commanding head position.

  \[(41) \quad \ast [_{CP} \text{Have } _{TP} \text{John should } _i \text{t}_i \text{eaten the pie}]]] \]
Echo Questions

(42) a. Sue loves who?
    b. John read what?

- Echo questions have different meaning from regular WH-questions. While WH-questions are requests for new information, echo questions request that the word which the WH-word stands for in the sentence be repeated, and often express surprise or amazement.

- Requires a particular intonational contour, with a stress on the in-situ WH-word.

- No WH-movement and no subj-aux inversion. The syntax of echo questions is similar to declaratives. C does not have [+WH] or [+Q].

- Since there is no movement involved, echo questions are not subject to MLC or island constraints.

(43) a. John knows who loves whom?
    b. John made the claim that the police caught whom?
    c. That Katie married whom is unbelievable?
Echo Questions (cont.)

CP
  └── C'
     ├── C
     │   ├── TP
     │   │   └── [Past]
     │   │       └── DP
     │   │           └── t_i
     │   └── T
     │       └── VP
     │           └── V
     │               └── read
     │                   └── DP
     └── [Past]

John

what