CAS LX 522 Syntax I
Fall 2001   November 6, 2001
Paul Hagstrom   Week 9: *Wh-movement*

Preliminary tree to remind ourselves: *They will bake a cake*.

(1)
CP
DS

C′
C [–Q]   TP
T′
T *will*   VP
DP   V′
D′   V *bake*   DP
D *they*   D′
D *a*   NP
N′
N *cake*

• Verb *bake* needs to assign two θ-roles.
• Finite T needs to assign NOM Case
• Finite T needs its specifier to be filled (EPP)
• DP *they* needs NOM Case   • DP *a cake* needs ACC Case

Wh-movement

Wh-questions in English (*who*(*m*), *what*, *where*, *why*, *when*, …) involve:
• Inversion ([+Q] C forces T to move to C).
• Movement of a *wh*-word to SpecCP.
     ([+WH] C requires [+wh] phrase in its specifier).

(2)   *What will they bake?*   Object *wh*-question
• Question (so C is [+Q]).
• *Wh*-question (so C is [+WH]).
• *bake* still has 2 θ-roles to assign.
• *what* is a DP, distinguished by [+wh] (is a *wh*-word).
• DPs need case, arguments need θ-roles.

(3)
CP
C′
DS

C [+Q] [+WH]   TP
T′
T *will*   VP
DP   V′
D′   V *bake*   DP
D *they*   D′
D *what* [+wh]

---

(4)
CP
SS

DP_k   C′
D′   C   TP
D *what* [+wh]   C [+Q] [+WH]   T_j *will*   DP_i   T′
D′   t_j   VP
D *they*   t_i   V′
V *bake*   t_k

Embedded questions…   **English-specific***!*

(5)   I hope [CP that Bill will leave tomorrow].
(6)   a.   I know [CP what you will do next summer].
        b. * I know [CP what will you do next summer].
(7)   a.   I wonder [CP what they baked].
        b. * I wonder [CP what did they bake].
(8)   I wonder [CP if they will bake a cake].

Inversion. Where C is [+Q], T must move to C.
                 English: Only true for matrix C.

Wh*-movement. Where C is [+WH], a [+wh] phrase must move to
                 SpecCP.

Since T does *not* move to [+Q] C in embedded questions, why not:

(9)   a.   * I know [CP what that you will do next summer].
        b.   * I wonder [CP what that they baked].

Doubly-filled COMP filter: **English only***!*
     * [CP *wh*-phrase *that* / *if* / *whether* …]

(10)
CP
What was baked?

C′
DS

C [+Q] [+WH]   TP
T′
T [PAST]   VP
V′
V *be*   VP
V′
V *baked*   DP
D′
D *what* [+wh]

(11)

$$CP$$

DP$_k$ — C′ ... SS

D′ ... C — TP

D ... C = T$_j$ ... t'_k — T′

what ... [+Q] ... t_j — VP

[+wh] ... [+WH] T = V$_i$

... [PAST] *be*

V′

t_i — VP

V′

V — t_k

baked

Notice: *Wh*-movement applies to *wh*-phrases which already have Case.
- We can't move a DP for Case after it's already *got* Case.
- We *can* move a [+wh] DP in *wh*-movement after it's got Case.
- In fact, we *have* to—DPs need Case.

Terminology:
    Movement for Case/EPP is **A-movement**
        ("Argument" movement—things which got θ-roles)
    Movement not for Case is **A′-movement** (**A-bar movement**)
        (e.g., for [+WH] feature of C).

***Wh*-words can move quite far**—they can be moved out of an embedded CP. Where does *what* get its θ-role? What CP is it in?

(12)   What$_i$ did Bill buy t_i ?

(13)   What$_i$ did Mary say [CP that Bill bought t_i] ?

(14)   What$_i$ did Sue think [CP that I said [CP that Bill bought t_i]]?

NOTE! *Wh*-movement works just as well in embedded questions.

(15)   Mary knows [CP what$_i$ Sue thinks [CP that Bill bought t_i]].

However, there are certain situations in which *wh*-movement appears to be **blocked**.

(16)   Bill claimed [CP that he drew a pumpkin in the syntax book].
(17)   What$_i$ did Bill claim [CP that he drew t_i in the syntax book] ?

(18)
Bill denied
[DP the claim [CP that he drew a pumpkin in the syntax book]].

(19)
*What$_i$ did Bill deny
[DP the claim [CP that he drew t_i in the syntax book]] ?

What's wrong?

☞ You cannot move a *wh*-word out of a CP contained within a DP.

The DP is a "complex noun phrase" island…
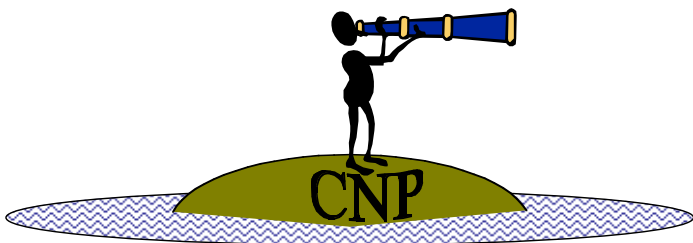
If a *wh*-word is in an *island* at DS, it cannot be moved off the island to an external SpecCP.

(20)   "You know what I blame this on the breakdown of? Society."
          —Moe Szyslak (*The Simpsons*, 5F07 *Miracle on Evergreen Terrace*)

(21)   I wonder [CP what$_i$ Bill bought t_i].

(22)   *Who$_j$ do you wonder [CP what$_i$ t_j bought t_i]?

(23)   Bill ate lunch at 1:00pm at Taco Bell.
(24)   When$_i$ did Bill eat lunch t_i at Taco Bell.
(25)   Mary asked when$_i$ Bill ate lunch t_i at Taco Bell.
(26)   Mary asked where$_i$ Bill ate lunch at 1:00pm t_i .
(27)   *When$_j$ will Mary ask [CP where$_i$ Bill ate lunch t_j t_i]
(28)   *Where$_i$ will Mary ask [CP when$_i$ Bill ate lunch t_j t_i]

***wh*-island: A CP with a *wh*-word in SpecCP is an island.**

The idea here is that a *wh*-word can't move *too* far. We can got *both* kinds of island if we suppose:
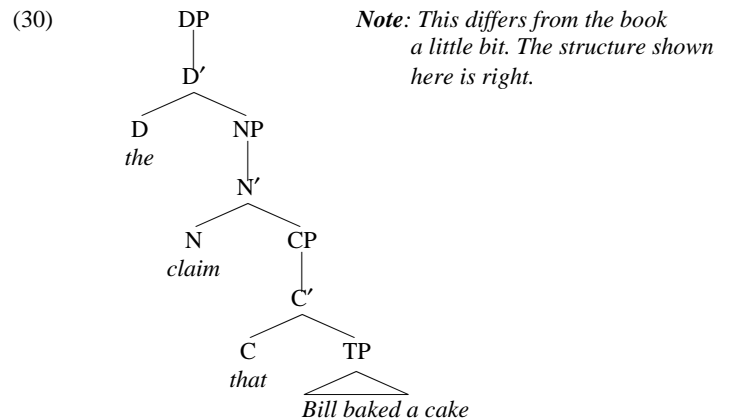

Subjacency condition:
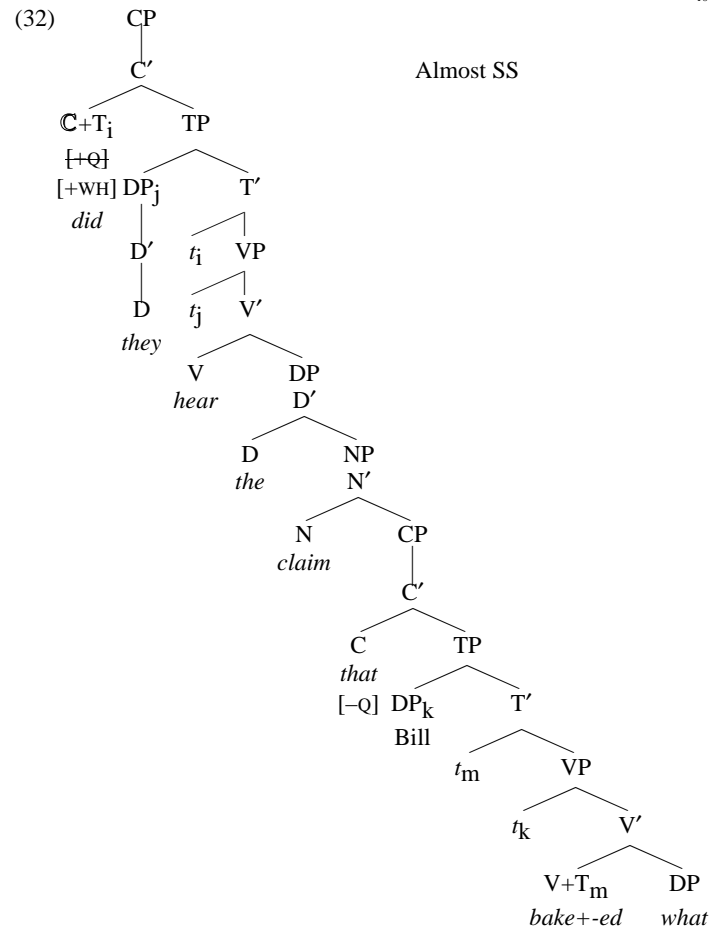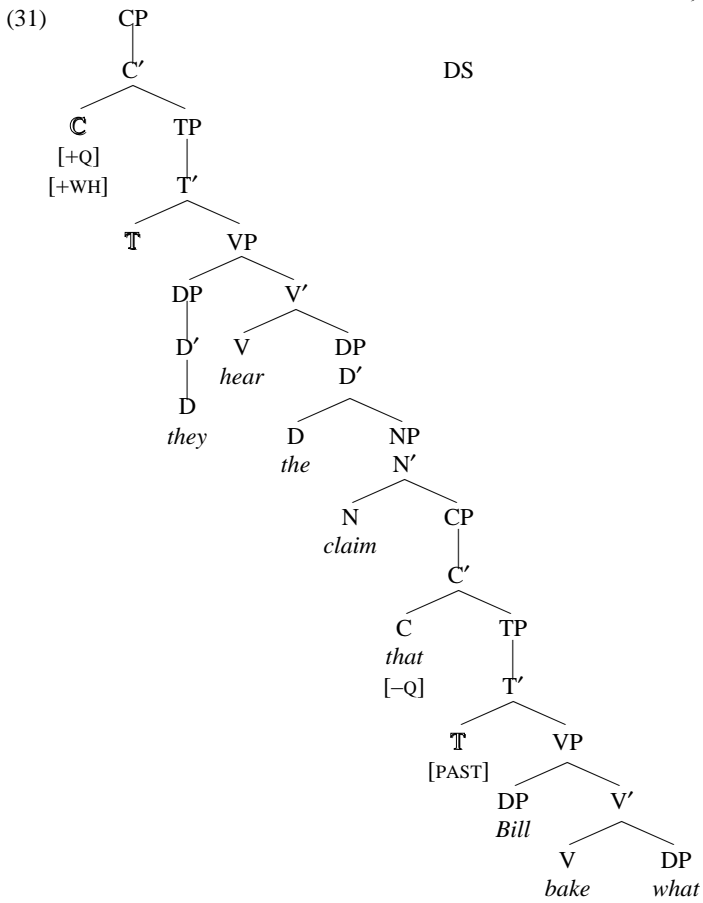*Wh*-movement may not cross more than one bounding node
    (but it may cross one)

Bounding nodes: DP, TP.

That's the answer, let's see how it works…

(29)   They heard the claim that Bill baked a cake.

(30)

$$DP$$

D′

D — NP

the

N′

N — CP

claim

C′

C — TP

that

Bill baked a cake

Note: This differs from the book a little bit. The structure shown here is right.

Now, let's try **What did they hear the claim that Bill baked?*

(31)   DS

[Tree diagram for (31), DS:
CP
  C'
    ℂ [+Q] [+WH]
    TP
      T'
        𝕋
        VP
          DP
            D'
              D
              they
          V'
            V *hear*
            DP
              D'
                D *the*
                NP
                  N'
                    N *claim*
                    CP
                      C'
                        C *that* [–Q]
                        TP
                          T'
                            𝕋 [PAST]
                            VP
                              DP *Bill*
                              V'
                                V *bake*
                                DP *what*]

(32)   Almost SS

[Tree diagram for (32), Almost SS:
CP
  C'
    ℂ+T_i [+Q] [+WH] *did*
    TP
      DP_j
        D'
          D *they*
      T'
        t_i
        VP
          t_j
          V'
            V *hear*
            DP
              D'
                D *the*
                NP
                  N'
                    N *claim*
                    CP
                      C'
                        C *that* [–Q]
                        TP
                          DP_k *Bill*
                          T'
                            t_m
                            VP
                              t_k
                              V'
                                V+T_m *bake+-ed*
                                DP *what*]

How about *What do you think that Mary baked?* then—?

(33)   What$_i$ do [$_{TP}$ you think that [$_{TP}$ Mary baked t_i]]?

Why isn't this out?

Successive-cyclic *wh*-movement:
When moving a *wh*-word out of a CP, it will move *first* to SpecCP and *then* out of the CP, in order to satisfy Subjacency.

McCloskey (2000). Quantifier float and *wh*-movement in an Irish English. *Linguistic Inquiry* 31(1):57-84. —fn. cf. *What do you want exactly?*

(34)   What all did you get *t* for Christmas?
(35)   What did you get all for Christmas?   (West Ulster)

(36)   All the students have left.
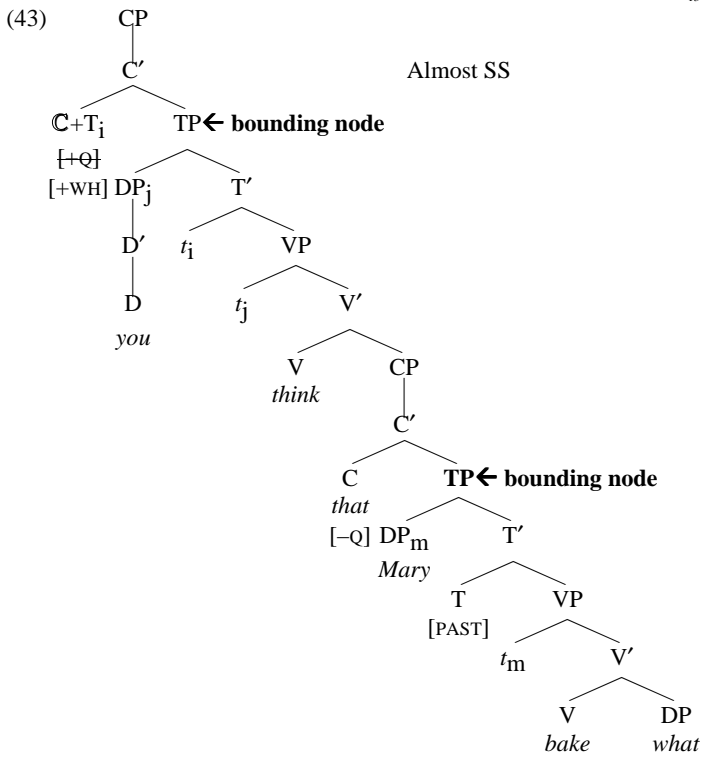(37)   The students have all left.

(38)   I don't remember [$_{CP}$ what I said all].

(39)   What all did he say (that) he wanted ?
(40)   What did he say (that) he wanted all ?
(41)   What did he say all (that) he wanted ?

(42)   DS

[Tree diagram for (42), DS:
CP
  C'
    ℂ [+Q] [+WH]
    TP ← **bounding node**
      T'
        𝕋
        VP
          DP
            D'
              D *you*
          V'
            V *think*
            CP
              C'
                C *that* [–Q]
                TP ← **bounding node**
                  T'
                    𝕋 [PAST]
                    VP
                      DP *Mary*
                      V'
                        V *bake*
                        DP *what*]

(43)

Almost SS

```
CP
 |
 C′
 /  \
C+Tᵢ    TP ← bounding node
[+Q]    /  \
[+WH] DPⱼ    T′
      |     /  \
      D′   tᵢ   VP
      |        / \
      D       tⱼ  V′
     you         / \
                V   CP
              think  |
                    C′
                   /  \
                  C    TP ← bounding node
                that   /  \
                [–Q] DPₘ   T′
                    Mary   / \
                          T   VP
                        [PAST] / \
                              tₘ  V′
                                 / \
                                V   DP
                              bake  what
```
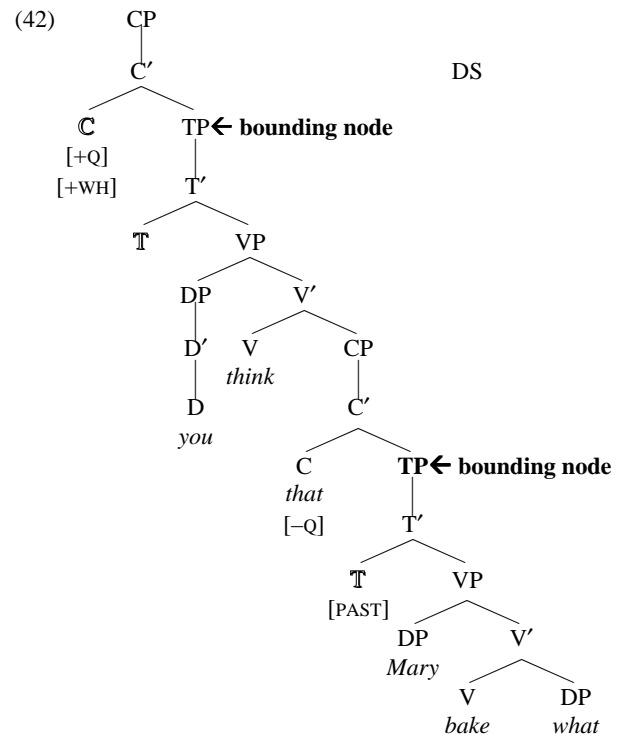
(44)   *Italian*

Tuo fratello ('your brother'),
[CP a cuiᵢ [TP mi domando [CP che storieⱼ [TP abbiano raccontato tᵢ tⱼ ...
   to whom   I wonder   which stories   they-have   told
era molto preoccupato ('was very worried').

(45)

* Tuo fratello,
[CP a cuiᵢ   'to whom'

   [TP temo [DP la possibilità [CP che [TP abbiano raccontato tutto tᵢ]] ...
    I-fear   the possibility   that   they-have   told   everything, ...

CNP islands are respected, *wh*-islands aren't?

(46)   Mi sto domandando [CP a chiᵢ
        I am wondering   to whom

potrei chiedere tᵢ [CP quandoⱼ dovrò parlare di questo argomento tⱼ]]
 I-may   ask   when   I'll-have-to speak about this   topic

(47)
* Questo argomento, [CP di cuiₖ mi sto domandando
   This   topic   of which I am wondering

[CP a chi potrei chiedere [CP quando dovrò parlare tₖ]]]
   to whom I-may ask   when I'll-have-to speak

mi sembra sempre più complicato
to-me seems ever more complicated

Italian bounding nodes: **CP** and **DP**. (Rizzi 1982)

Subject *wh*-questions: Who moved my cheese?
                                  Who will eat this sandwich?

• Because the subject *is* the *wh*-word, no inversion is detectible.
• Nor is there any *do* support   *(*Who did move my cheese?)*

Nevertheless, in the interest of simplicity and theory-internal
consistency, we assume nothing is really different...
            (but cf. *Vacuous Movement Hypothesis*, Chomsky 1986 *inter alia*)
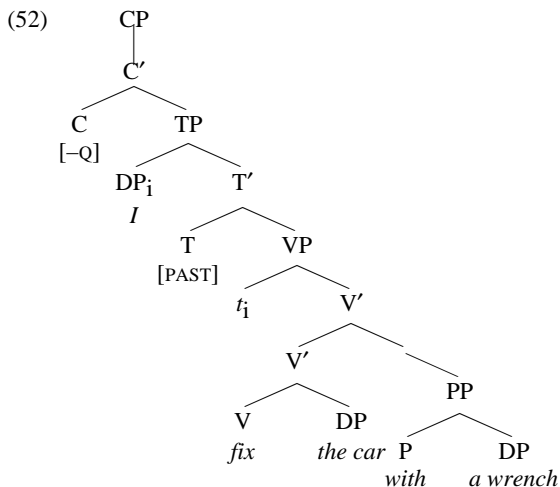
(48)

DS

```
        CP
         |
         C′
        /  \
       C    TP
      [+Q]  /  \
      [+WH] T′
            /  \
           T    VP
         [PAST] / \
          -ed  DP   V′
              / \   / \
             D′  V   DP
             |  eat  |
             D       D′
            who      |
           [+wh]     D
                     it
```

(49)

SS?

```
              CP
             /  \
           DPᵢ    C′
            |    /  \
            D′  C     TP
            |   ‖    /  \
            D  C  Tⱼ  t′ᵢ   T′
          who [+Q][PAST]   / \
         [+wh] [+WH] -ed  tⱼ  VP
                            / \
                           tᵢ  V′
                              / \
                             V   DP
                            eat  |
                                 D′
                                 |
                                 D
                                 it
```

Wait!—*what is
going on with affix hopping
and do-support here?*

(50)

```
affix hopping
do-support →
```
```
        DS   ← θ-criterion
         |
         |   ← movement, expletive insertion
         |
         SS  ← Case filter, EPP
        /  \
       /    \
     PF      LF  ← interpretation
                    (next week)
```
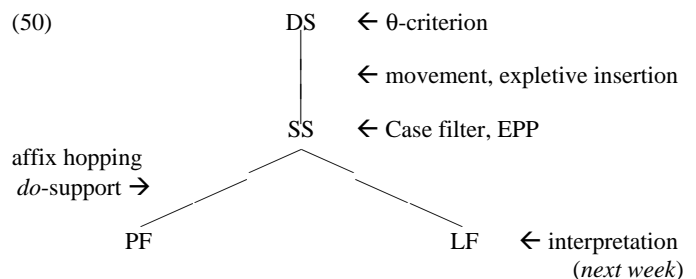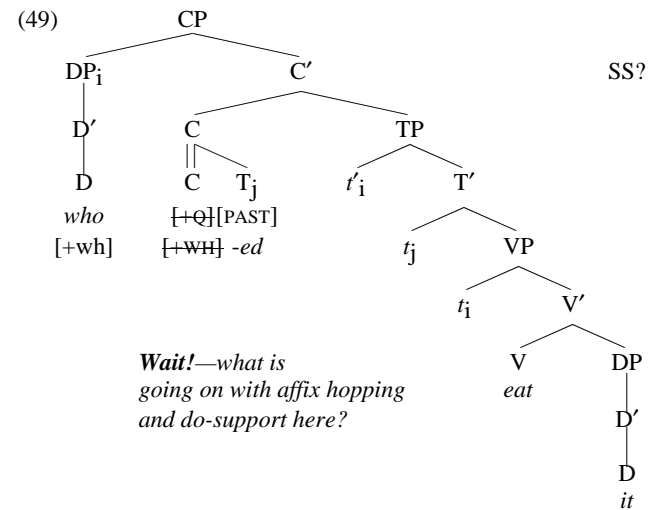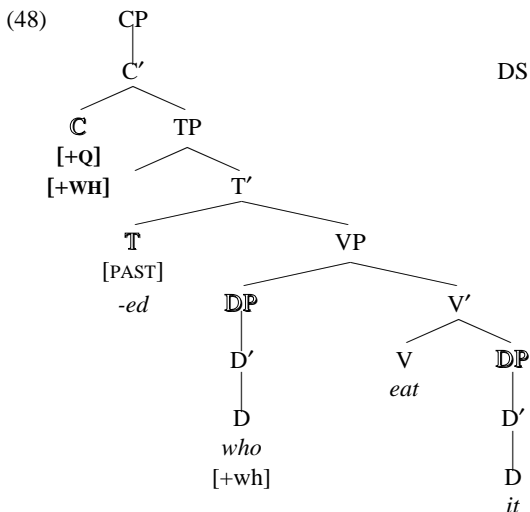
**Movement before SS is *always* upwards, to a c-commanding pos'n.
"Movement" on the PF branch doesn't really act like movement.**

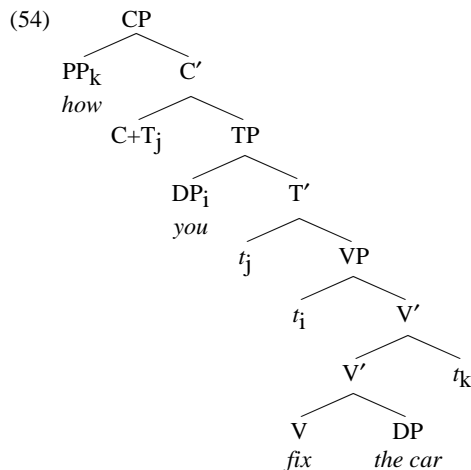**Argument** *wh*-questions vs. **adjunct** *wh*-questions...

Argument *wh*-questions are subject *wh*-questions, object *wh*-questions.
    Who bought the book? What did Bill buy? What was eaten?

Adjunct *wh*-questions are those which question constituents which in a declarative would be adjuncts.

(51) I fixed the car *with a wrench*.

(52)
```
CP
 └ C′
   ├ C          TP
   │ [–Q]     ├ DP_i   T′
   │          │  I    ├ T        VP
   │          │       │ [PAST]  ├ t_i    V′
   │          │       │         │      ├ V′            PP
   │          │       │         │      │ ├ V    DP   ├ P     DP
   │          │       │         │      │ │ fix  the car with  a wrench
```
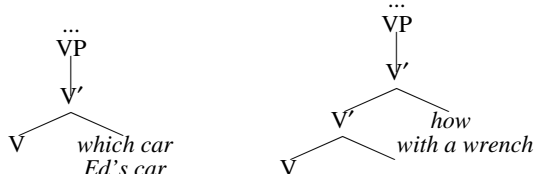
(53) How_i did you fix the car t_i ?

(54)
```
CP
 ├ PP_k        C′
 │  how      ├ C+T_j     TP
 │           │         ├ DP_i    T′
 │           │         │  you  ├ t_j    VP
 │           │         │       │      ├ t_i    V′
 │           │         │       │      │      ├ V′        t_k
 │           │         │       │      │      │ ├ V    DP
 │           │         │       │      │      │ │ fix  the car
```

Adjunct *wh*-questions are more delicate than argument *wh*-questions.

(55) ?Whose car_i were you wondering how to fix t_i?
    (Ed's car...I was wondering how to fix Ed's car.)

(56) *How_i were you wondering whose car to fix t_i?
    (With a wrench...
        I was wondering whose car to fix with a wrench.)

What makes these different?

(57)
```
    ...VP                          ...VP
     └ V′                           └ V′
       ├ V   which car               ├ V′        how
       │     Ed's car                │ └ V       with a wrench
```

(58) *How_i were [TP you wondering [CP whose car [TP to fix t_i]]]?
    (With a wrench...
        I was wondering whose car to fix with a wrench.)

(59) How_i did [TP you fix the car t_i]?
(60) How_i did [TP Bill say [CP t_i′ that [TP you fixed the car t_i]]]?

It appears that adjuncts are hyper-sensitive to Subjacency violations, but it possible to move an adjunct *wh*-word as long as it doesn't go too far.

Interestingly, *subjects* generally act like adjuncts—

(61) ? [Which car]_i do you know [CP how Bill fixed t_i]?
(62) * How_i do you know [CP which car Bill fixed t_i]?
(63) * Who_i do you know [CP which car t_i fixed (with a hammer)]?
(64) * Who_i do you know [CP how t_i fixed (the Pacer)]?

Usually...

(65) [Which chair]_i do you find [t_i will roll most smoothly]?
(66) [Which taxi service]_i do you consider [t_i most reliable]?

It kind of looks like "traces which get accusative Case" are safe.

Nailing down the precise formulation of this restriction is *very* complicated... (see Chomsky 1986, Rizzi 1990)

Here is a close approximation:

Empty Category Principle (ECP)	*Lexical*: N, V, A, P
Traces must be properly governed	*Functional*: C, T, D

Proper Government
α properly governs β iff
        (i) α governs β and α is a lexical head
or   (ii) α antecedent-governs β.

Idea: (i) *accounts for* ?What_i did you say knew how Bill fixed t_i ?
        (ii) *allows for* How_i did you fix the car t_i ?
            "antecedent governs" means *How* and its trace are close.

Antecedent Government (first attempt)
α, a moved category, antecedent-governs β iff
        i) α binds β (c-commands & co-indexed)
        ii) no more than one bounding node
            dominates β but not α.

        '…if moving from β to α would not
            violate Subjacency'

(67) ? Which song_i were [TP you wondering
        [CP whether [TP the band will play t_i]]?

(68) * Which band_i were [TP you wondering
        [CP whether [TP t_i will play that song]]]?

(69) ? Which car$_i$ do you know how to fix t_i?

(70) * Who$_i$ do you know how t_i will fix the car?

(71) Which band$_i$ did you consider [t_i to be the best]?

That-trace effect

(72) What$_i$ did you say (that) Bill would fix t_i ?

(73) *Who$_i$ did you say (*that) t_i would fix the car ?

This differentiates subjects and objects—it looks like a job for the ECP. When the trace must rely on antecedent government, *that* blocks it.
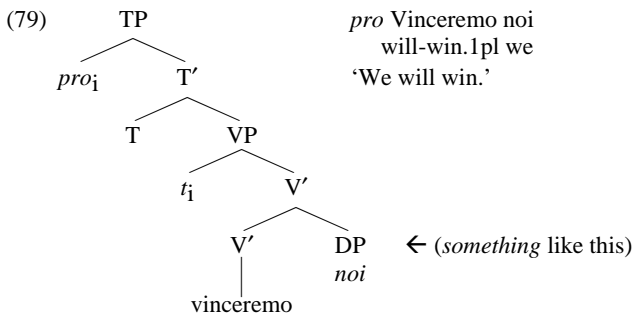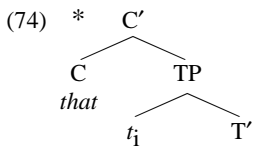
Empty Category Principle (ECP)
Traces must be properly governed

α **properly governs** β iff
    (i) α governs β and α is a lexical head
or (ii) α antecedent-governs β.

    α **antecedent-governs** β iff
    (i) α binds β
    (ii) no more than one bounding
         node dominates β but not α.
    (iii) there is no filled C governing β.

(74) * [C' [C that] [TP t_i [T']]]

That-trace effects aren't universal, though...

(75) *Italian*
Chi hai   detto **che** ha scritto questo libro?
who have-you said **that** has written this book
'Who did you say wrote this book?'
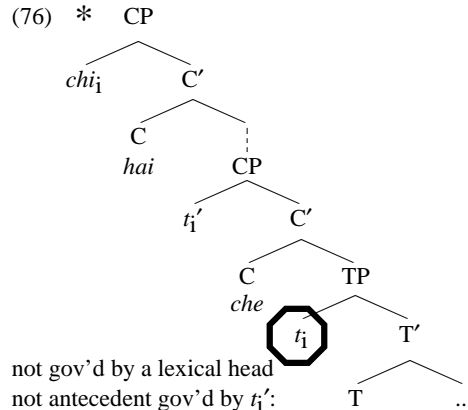
(76) * [CP chi$_i$ [C' [C hai] [CP t_i' [C' [C che] [TP t_i [T' T ...]]]]]]
not gov'd by a lexical head
not antecedent gov'd by t_i':
    • t_i' binds t_i
    • no bounding nodes intervene
but • there *is* a filled C (*che*) governing t_i.

(77) Hanno telefonato molti studenti
have.3pl phoned many students
'Many students have phoned.'

(78) Vinceremo noi
will-win.1pl we
'We will win.'

(79) [TP pro$_i$ [T' T [VP t_i [V' [V' vinceremo] [DP noi]]]]] ← (*something* like this)
pro Vinceremo noi
will-win.1pl we
'We will win.'

Can this help?

(80)
How$_i$ did you say (that) he will fix your car t_i ?

(81) ...
[CP t_i' [C' [C (that)] [**TP** he$_j$ [T' [T will] [VP t_j [V' [V' fix your car] t_i]]]]]]

(82) *Italian*
Chi hai   detto **che** ha scritto questo libro?
who have-you said **that** has written this book
'Who did you say wrote this book?'

(83)
[CP Chi$_i$ [TP *pro* hai detto [CP t_i' che [TP *pro* ha [VP scritto question libro] t_i]]]]

(84) [CP chi$_i$ [C' [C hai] [CP t_i' [C' [C che] [TP pro$_j$ [T' T [VP t_j [V' [V' scritto question libro] t_i]]]]]]]]
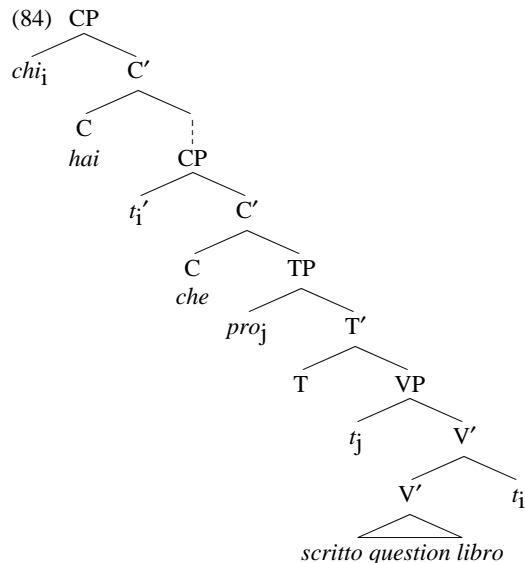
(85) Mario ᴇ parla   *Florentine It.*
Mario SCL speaks
'Mario speaks.'

(86) ᴇ parla
SCL speaks
'He speaks'

(87) * Parla

(88) gl   'ha telefonato della ragazze
SCL(M.SG) has phoned some girls(F.PL)
'Some girls telephoned.'

(89)
Quante ragazze tu credi che gli abbia parlato?
how.many girls you think that M.SG has.3SG spoken
'How many girls do you think have spoken?'

(90)
* Quante ragazze tu credi che le abbiano parlato?
how.many girls you think that F.PL have.3PL spoken
('How many girls do you think have spoken?')

The category of *wh*-words:

(91)

(92)

(93)
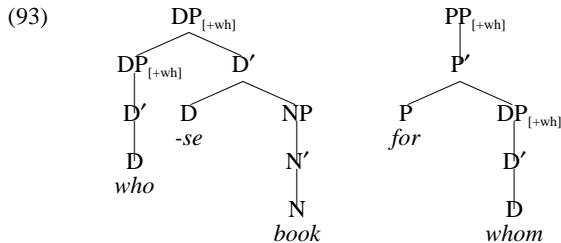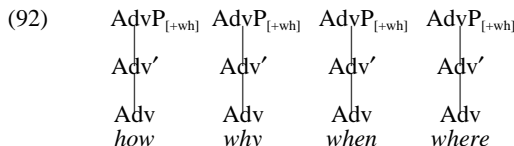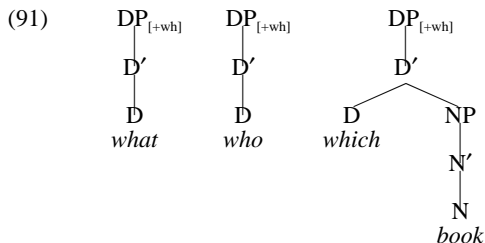
Pied-piping: [For whom]$_i$ did you buy that bagel t_i ?
P-stranding: Who(m)$_i$ did you buy that bagel for t_i ?

Relative clauses

(94) Bill heard [$_{DP}$ the speech$_i$ [$_{CP}$ which$_i$ [$_{TP}$ Mary made t_i]]].

Restrictive relatives restrict the reference of the *head noun*.
Semantically, we refer to something which is both:
• a speech
and   • (something) which Mary made.

*Appositive relatives* don't restrict the reference, but provide additional information

(95) a.   Mary, who you met yesterday, just bought a house.
b.   Mary, [$_{CP}$ who$_i$ [$_{CP}$ you met t_i yesterday]], ...

Free relatives involve *-ever* and don't modify a head noun

(96) a.   I will buy [whatever$_i$ you sell t_i].
b.   Whoever just arrived unplugged my lamp.

(97) a.   Bill heard the speech [which Mary made].
b.   Bill heard the speech [that Mary made].
c.   Bill heard the speech [Mary made].

(98) Bill heard [$_{DP}$ the speech [$_{CP}$ Op$_i$ (that) [$_{TP}$ Mary made t_i]]].

(99)
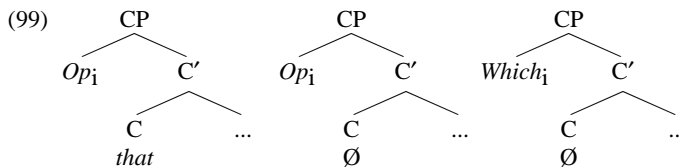
Is it really *wh*-movement? What do we know about *wh*-movement?

(100)
* I know the way which$_i$ John wonders [$_{wh}$-island why Bill went t_i].

(101)
* I know the way which$_i$ John made [$_{CNP}$ the claim that Bill went t_i].

(102)
*I know the way Op$_i$ (that) John wonders [$_{wh}$-island why Bill went t_i].

(103)
*I know the way Op$_i$ that John made [$_{CNP}$ the claim that Bill went t_i].

So: • If relative clauses allow an *Op*, why can't *wh*-questions?
• Why can you have *that* with *Op* but not with *which*?
*I heard the speech which$_i$ that Mary made t_i .

Recoverability Condition
The content of a null category must be recoverable (from a co-indexed overt category in the sentence).

(104) a.   When did Mary buy the book?
b.   Where did Mary buy the book?
c.   How did Mary buy the book?
d. * Op$_i$ did Mary buy the book?

(105)   a.   * *Op*$_i$ did Mary buy *t*$_i$?

  b.   * *Op*$_i$ did Mary give a book *t*$_i$?

(106)   Bill heard the speech$_i$ [$_{CP}$ *Op*$_i$ that [$_{TP}$ Mary made *t*$_i$]].

Doubly Filled Comp Filter
  *[$_{CP}$ *wh*-XP *that / if / whether…*], if *wh*-XP is overt (non-null).

(107)   Sample relative clause:
       The student Bill will meet.