# More types of $\overline{\text{A}}$-movement

## 1  Introduction

- ***Varieties of $\overline{\text{A}}$-movement***

  (1)  a.  **Wh-movement**
       [ Which country ] does Björk come from ___ ?

  b.  **Relative clauses**
      the person [ who [ Maria is teaching ___ ] ]

  c.  **Topicalization**[1]
      [ PHONETICS ], I will never enjoy ___ more than SYNTAX.

  d.  **Extraposition**
      [ The claim ___ ] was refuted [ that all languages are context-free ].

  e.  **Heavy NP Shift**
      I gave ___ to Maria [ a book about the Russian Revolution ].

  f.  **Clefts**
      It is clefting [ Op that [ this sentence illustrates ___ ] ].

  g.  **Quantifier Raising (QR)**[2]
      [ ~~every kohlrabi~~ ] some child ate [ every kohlrabi ].

- ***What moves in movement?***
  - Displacement can in principle be analyzed in one of two ways:
    * Movement of the displaced element itself, e.g. *wh*-movement.
    * Base-generation of the displaced element in its surface position and movement of a null operator to a position immediately below the displaced element, e.g. clefts.
  - The second option might seem odd, but sometimes the displaced element does not exhibit CONNECTIVITY EFFECTS with the gap position, e.g. case and scope. The second option can make sense of this discrepancy.

    (2)  **Hypothetical example**
         a.  [ **Who(\*m)** ] did Maria like ___ ?
         b.  { **She** / **\*her** }, Maria likes ___ .

  - Chomsky (1977) in fact analyses most cases of (what we now call) $\overline{\text{A}}$-movement essentially in terms of null operators. For him, they involve movement of *what* followed by subsequent deletion of *what*.

[1] There are at least two other movement types in English that front elements for information-structure purposes: focus movement (*Macadamia nuts, they're called*) and Y(iddish)-movement (*%A finger, I wouldn't lift for him!*). See Ross (1967); Prince (1981); Constant (2014).

[2] Traditionally, the covertness of QR was the result of it happening at LF. Under the Copy Theory of Movement though, QR can be analyzed as ordinary movement in the narrow syntax, where the higher copy is not pronounced (Bobaljik 2002).

# 2 Chomsky (1977)

- Chomsky (1977) brought together a bunch of movement types (i.e. transformations) into what we now recognize as $\overline{\text{A}}$-movement.[3]

* **Properties of $\overline{\text{A}}$-movement**
  He argued that $\overline{\text{A}}$-movement has the following characteristics:[4]

  (3) a. it leaves a gap

   b. where there is a bridge, there is an apparent violation of subjacency, the PIC (Propositional Island Condition), and the SSC (Specified Subject Condition)
   ⤳ i.e. it can occur long distance, across clause boundaries

   c. it observes the Complex NP Constraint

   d. it observes the *Wh*-island Condition

⇒ These characteristics are *still* used to diagnose a movement type as $\overline{\text{A}}$-movement—with the addition of the adjunct islands of Huang (1982).

- **Some historical background**

  – The *Propositional Island Condition* (also known as the *Tensed-S Condition*) blocked transformations across finite-clause boundaries:

   (4) **Propositional Island Condition (PIC)**
   No rule can involve X, Y in the structure $\ldots X \ldots [_\alpha \ldots Y \ldots]$, where $\alpha$ is a tensed sentence.                                          [Chomsky 1973]

   (5) **What the PIC accounted for**

   a. I believe [$_{\text{UNTENSED}}$ Alex to be reading the book ].

   b. I believe [$_{\text{TENSED}}$ Alex is reading the book ].

   c. Alex$_1$ was believed [$_{\text{UNTENSED}}$ ____$_1$ to be reading the book ].

   d. *Alex$_1$ was believed [$_{\text{TENSED}}$ ____$_1$ is reading the book ].

  – The *Specified Subject Condition* blocked transformations across embedded overt subjects:

   (6) **Specified Subject Condition (SSC)**
   No rule can involve X, Y in the structure $\ldots X \ldots [_\alpha \ldots Z \ldots -\text{WYV} \ldots]$, where Z is the specified [$\approx$ overt] subject of WYV in $\alpha$.                    [Chomsky 1973]

   (7) **What the SSC accounted for**

   a. The commanders$_1$ expected [ to hug each other$_1$ ].

   b. *The commanders$_1$ expected [ **the soldier** to hug each other$_1$ ].

  – Neither of these constraints lasted all that long, and the data are now handled in other ways (e.g. minimality, ban on hyperraising).

  – Unfortunately, the initials 'PIC' later got recycled for the *Phase Impenetrability Condition*!

[3] Note that Chomsky considered them all just "*wh*-movement".

[4] A-movement also obeys all of these conditions, but in English, largely only vacuously so because A-movement in English is subject to much more stringent locality constraints.

## 2.1 Topicalization

- As shown below, topicalization has the properties in (3):

  (8) a. **Leaves a gap**
      This book, I really like { ___ / *this magazine }.[5]

      b. **Can be long distance**
      This book, I asked Alex [ to get his students to read ___ ].

      c. **Obeys the Complex NP Constraint**
      *This book, I accept [$_{DP}$ the argument [$_{CP}$ that Alex should read ___ ]].

      d. **Obeys the *Wh*-island Condition**
      *This book, I wonder [$_{CP}$ who read ___ ].

[5] A pronoun is okay in the gap position: *This book, I really like it*. The prosody is different from topicalization, however. These cases with a pronoun are considered a separate movement type called LEFT DISLOCATION.

- *Chomsky's analysis*

  – Topicalization has the following derivation:[6]

    (9)  [ *this book* ] [$_{CP}$ **what** C$^0$ [ I asked Alex to get his students to read ___ ] ].

[6] Throughout this section, I have updated the labels and such to fit modern terminology.

  – The *what* gets deleted later by a general-purpose rule that deletes *wh*-phrases. Chomsky is not explicit about what conditions this deletion.

  – Under this analysis, topicalization is analogous to the following paraphrases:

    (10) a.  This book is what I asked Alex to read

         b.  It is this book that I asked Alex to read

- *Embedded topicalization*
  An upshot of analyzing topicalization as $\overline{\text{A}}$-movement is that it gives us a handle on the behavior of embedded topicalization.

  – Topicalization can occur within embedded clauses, like *that*-clauses:

    (11)  I informed the students [ that **this book**, they would definitely have to read ___ ].

  – However, topicalization is not possible within relative clauses and questions:

    (12)  John gave away [ the books ] [ to some friends ].
          a. **Question**
             *[ *To whom* ]$_1$ {did} [ **the books** ]$_2$ {did} did John give away ___$_2$ ___$_1$?
          b. **Question**
             *[ *Whom* ]$_1$ {did} [ **the books** ]$_2$ {did} John give away ___$_2$ to ___$_1$?
          c. **Relative clause**
             *the child [$_{CP}$ [ *to whom* ]$_1$ [ **the books** ]$_2$ John gave away ___$_2$ ___$_1$ ]
          d. **Relative clause**
             *the child [$_{CP}$ [ *whom* ]$_1$ [ **the books** ]$_2$ John gave away ___$_2$ to ___$_1$ ]

- Chomsky argues that embedded topicalization is ruled out in these cases because the $\overline{\text{A}}$-movement necessary for the question or the relative clause cannot cross the topicalized element without violating a locality constraint (PIC or SSC):

(13)   the child $[_{CP}$ ___ $C^0$ $[_{CP}$ [ **the books** $]_1$ $C^0$ [ John gave away ___$_1$ to **whom** $]]]$
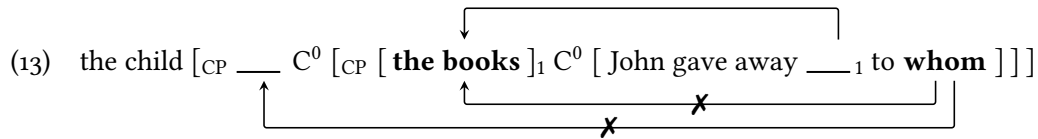
⇒ Essentially, because topicalization is just *wh*-movement, it can create the equivalent of a *wh*-island.

- NB: The facts concerning embedded topicalization are (perhaps predictably) more complex than what Chomsky (1977) makes them out to be:[7]
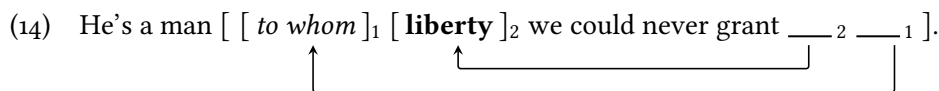
(14)   He's a man [ [ *to whom* $]_1$ [ **liberty** $]_2$ we could never grant ___$_2$ ___$_1$ ].

## 2.2   Degree constructions

- At first glance, it is not obvious that comparative constructions and other degree constructions involve movement at all:

(15)   a.   John is taller than Mary (is).

   b.   John is the same as Mary (is).

   c.   John is as tall as Mary (is).

(16)   a.   This bank is too big to fail.

   b.   This bank is big enough to break up.

- However, Chomsky observes that they in fact have the properties in (3):

(17)   a.   **Leaves a gap**
      Mary isn't the same as [ she was { ___ / *tall } five years ago ].

   b.   **Can be long distance**
      Mary isn't the same as [ John believes [ that Bill claimed [ that she was ___ five years ago ] ] ].

   c.   **Obeys the Complex NP Constraint**
      *Mary isn't the same as [ John believes [$_{DP}$ Bill's claim [$_{CP}$ that she was ___ five years ago ] ] ].

   d.   **Obeys the *Wh*-island Condition**
      *Mary isn't the same as [ I wonder [$_{CP}$ whether she was ___ five years ago ] ].

(18)   a.   **Leaves a gap**[8].
      This bank is big enough [ to break up ___ ].

   b.   **Can be long distance**
      This bank is big enough [ for us to petition the government [ to break up ___ ] ].

c. **Obeys the Complex NP Constraint**
     *This bank is big enough [ to make [$_{DP}$ the demand [$_{CP}$ that the government should break up ___ ] ] ].

  d. **Obeys the *Wh*-island Condition**
     *This bank is big enough [ to wonder [$_{CP}$ whether the government should break up ___ ] ].

- Accordingly, Chomsky argues that these degree constructions should be analyzed in terms of *wh*-movement followed by deletion of the *wh*-phrase:

(19)  Mary isn't the same as [ **what** [ she was ___ five years ago ] ].

# 3 Relative clauses

⇒ Relative clauses (RCs) are dependent clauses that modify a noun, which is called the HEAD of the RC. Within the RC itself, there is $\overline{\text{A}}$-movement to the edge (i.e. [Spec, CP]).

- In English, RCs come in various forms, so let us take the canonical types in turn.

(20)  a. **With a relative pronoun**
         the person [$_{RC}$ who I know ___ ]

      b. **Contact relative**
         the person [$_{RC}$ I know___ ]

      c. **With a complementizer**
         the person [$_{RC}$ that I know ___ ]

## 3.1 Relative pronouns

- RCs are canonically introduced by a RELATIVE PRONOUN, e.g. *who* and *which*, which refers to the head noun:

(21)  a. I know a *cat* [ **who** likes lasagna ].

      b. Can you think of *things* [ **which** she might need ]?

      c. Is there *anybody* [ **whose car** I can borrow ]?

- *Relative pronouns ≠ wh-pronouns*
  Relative pronouns are the same as the *wh*-pronouns in English, but this does not hold crosslinguistically, as show below. Therefore, we will treat them as formally distinct in our analysis.[9]

(22)  **Finnish: Distinct relative pronouns**

      a. **Relative clause**
         Minä  tunne-n   kissa-n, [$_{RC}$ **joka**     pitä-ä    lasagne-sta ]
         I.NOM know-1SG cat-ACC      REL.NOM like-3SG lasagna-ELA
         'I know a cat that likes lasagna'

[9] ACC = accusative (object)
ELA = elative ('from')
NOM = nominative (subject)

5

b.  **Constituent question**
    **Kuka**      pitä-ä    lasagne-sta?
    who.NOM   like-3SG   lasagna-ELA
    'Who likes lasagna?'

(23)  **German: Relative pronouns homophonous with definite determiners**

a.  **Relative clause**
    Ich  kenne  eine  Katze,  [RC **die**      Lasagne  mag  ]
    I    know   a     cat            REL.NOM  lasagna  likes
    'I know a cat that likes lasagna'

b.  **Constituent question**
    **Wer**  mag   Lasagne?
    who   likes  lasagna
    'Who likes lasagna?'

- As shown below, RCs with relative pronouns have the properties in (3):

(24)  a.  **Leaves a gap**
          That's the man [ who I met { ___ / *him } last week ].

      b.  **Can be long distance**
          That's the man [ who Maria believed [ that I had met ___ last week ] ].

      c.  **Obeys the Complex NP Constraint**
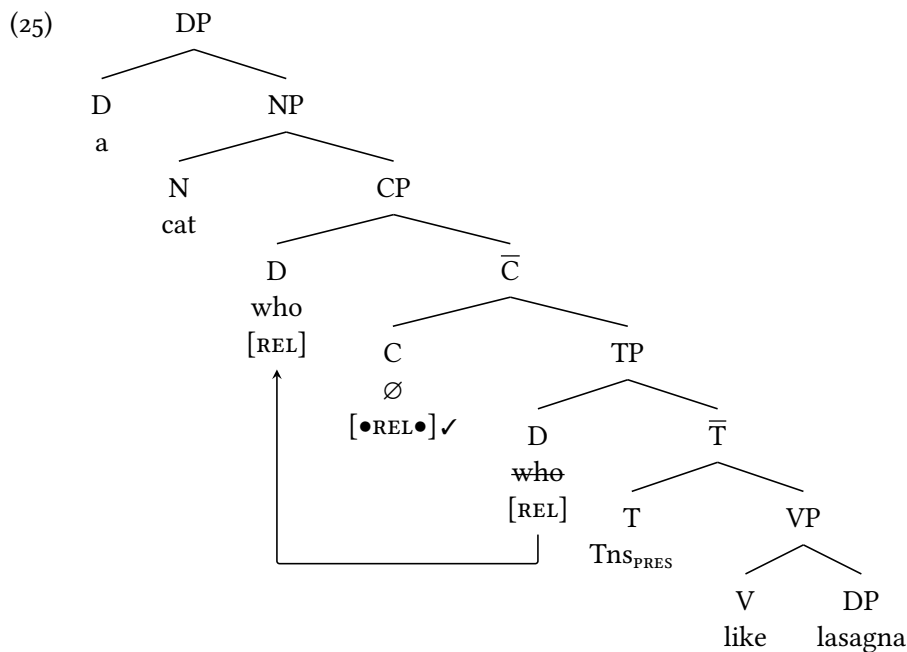          *That's the man [ who Maria had [DP the belief [CP that I had met ___ last week ] ] ].

      d.  **Obeys the *Wh*-island Condition**
          *That's the man [ who Maria wondered [CP whether I had met ___ last week ] ].

∗ *Derivation of an RC*
  The relative pronoun A̅-moves to the edge of the RC, i.e. [Spec, CP]:[10]

[10] The feature that attracts the relative pronoun to [Spec, CP] is [•REL•].

(25)

## 3.2 Contact relatives

- It is also possible in English for the relative pronoun to be given a null spellout. These are called CONTACT RELATIVES:

  (26) a. I know a place [ **(where)** you can stay ].

  b. That's the reason [ **(why)** I was late ].

  c. I remember the time [ **(when)** we first met ].

- Contact relatives are only possible with non-subject relatives and when no material would have been pied-piped.

- We know that there is a silent relative pronoun because the RC dependency displays all the properties of $\overline{\text{A}}$-movement, and therefore *something* must be moving:

  (27) a. **Leaves a gap**
      That's the man [ **(who)** I met { ___ / *him } last week ].

  b. **Can be long distance**
      That's the man [ **(who)** Maria believed [ that I had met ___ last week ] ].

  c. **Obeys the Complex NP Constraint**
      *That's the man [ **(who)** Maria had [$_{\text{DP}}$ the belief [$_{\text{CP}}$ that I had met ___ last week ] ] ].

  d. **Obeys the *Wh*-island Condition**
      *That's the man [ **(who)** Maria wondered [$_{\text{CP}}$ whether I had met ___ last week ] ].

## 3.3 *That*-relatives

- It is also possible in English for RCs to be formed with the complementizer *that*, but then no overt relative pronoun is allowed:

  (28) a. I know a place [ *(\*where)* **that** you can stay ].

  b. That's the reason [ *(\*why)* **that** I was late ].

  c. I remember the time [ *(\*when)* **that** we first met ].

- *That*-relatives also display all the properties of phrasal movement:

  (29) a. **Leaves a gap**
      That's the man [ **that** I met { ___ / *him } last week ].

  b. **Can be long distance**
      That's the man [ **that** Maria believed [ that I had met ___ last week ] ].

  c. **Obeys the Complex NP Constraint**
      *That's the man [ **that** Maria had [$_{\text{DP}}$ the belief [$_{\text{CP}}$ that I had met ___ last week ] ] ].

  d. **Obeys the *Wh*-island Condition**
      *That's the man [ **that** Maria wondered [$_{\text{CP}}$ whether I had met ___ last week ] ].

- Chomsky and Lasnik (1977) proposed that *that*-relatives contain a relative pronoun, but there is a constraint against having that relative pronoun be overt in the presence of *that*:

7

(30) **Multiply Filled COMP Filter**
Any CP containing an overt complementizer with an overt specifier is un-grammatical.

(31) a. **Obeys the Multiply Filled COMP Filter**
I know a *cat* [$_{CP}$ ~~who~~ that$_{[\bullet REL \bullet]}$ [$_{TP}$ ~~who~~ likes lasagna ] ].

b. **Violates the Multiply Filled COMP Filter**
*I know a *cat* [$_{CP}$ **who** that$_{[\bullet REL \bullet]}$ [$_{TP}$ ~~who~~ likes lasagna ] ].

- *Anti-that-trace effect*
Interestingly, a subject RC without an overt relative pronoun *requires* the complementizer *that*, which is the opposite pattern that we saw for *wh*-movement:

(32) a. ***Wh*-movement**
Who did Dorothy think [ **(*that)** ___ saw Blanche ]?

b. **Relative clause**
Rose is the woman [ ~~who~~ *(**that**) [ ~~who~~ saw Blanche ] ].

## 3.4 Raising vs. matching

- An active question in the syntactic literature is the relationship between the head noun and the relative-clause gap.

- In addition to the completely head-external analysis that we saw above, there are two other analyses: a raising analysis and a matching analysis.[11] For now, it is only important that you know that such analyses exist and how they work.

[11] Sauerland (1998), Bhatt (2002, 2006), and Hulsey and Sauerland (2006) argue that RCs are actually ambiguous between a raising and a matching derivation.

- ✳ *Raising analysis*
Under the raising analysis, the head starts out in the RC, merging with the relative pronoun to form a DP. The relative-pronoun DP moves to [Spec, CP], and then the head undergoes a short step of movement out of the RC:

(33)
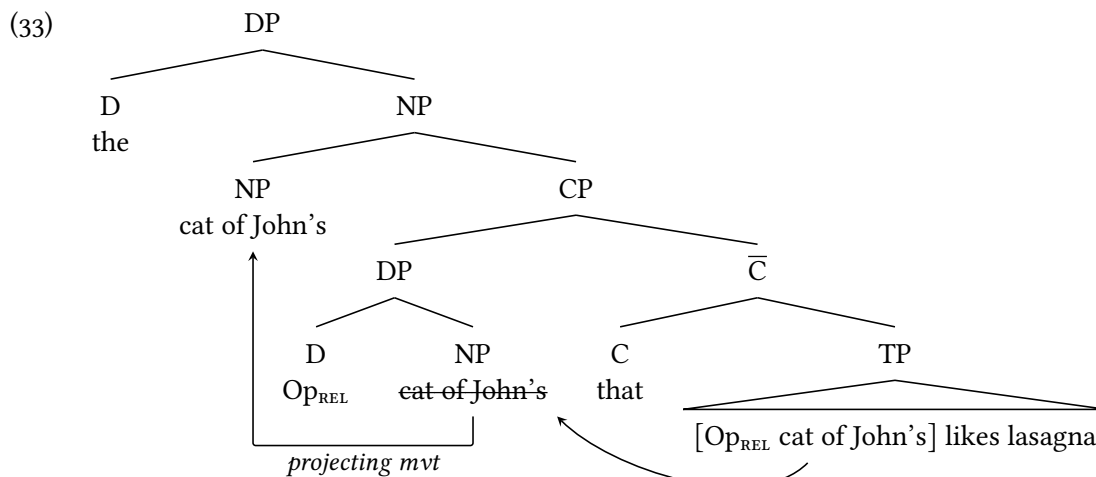


- Note that the movement of the head NP out of the RC must create its own landing site. This is known as PROJECTING MOVEMENT.

✱ *Matching analysis*

Under the matching analysis, the head is external to the RC. The relative pronoun merges with an NP that matches the head. The relative-pronoun DP moves to [Spec, CP], and its NP undergoes deletion under matching:

(34)
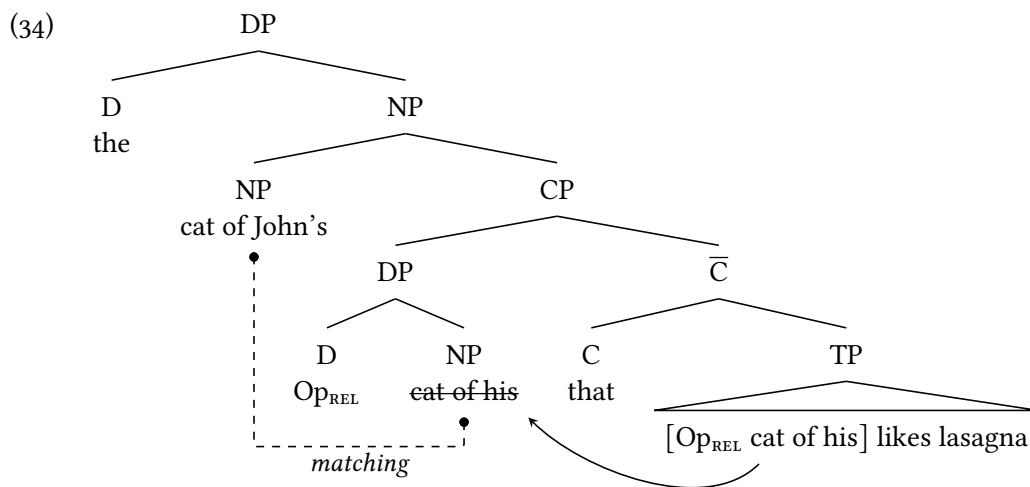


- Note that the head and the RC-internal NP may have slight mismatches (as in the above example).

# 4 Pied-piping

- *Question*

[•wh•] attracts the closest *wh*-phrase. On this simplistic view, the following pair is not accounted for:

(35) a. [ **Where** ] did she walk to ___ ?

b. [ **To where** ] did she walk ___ ?

⇒ In formal registers of English, the preposition must be dragged along with the *wh*-pronoun so that the entire PP moves to [Spec, CP]. This is called PIED-PIPING.[12]

- However, not all instances of pied-piping are restricted to Formal English:

(36) a. [ **Which movie** ] did she watch ___ ?

b. [ **Whose movie** ] did she watch ___ ?

c. [ **How tall** ] is Alex ___ ?

d. [ **How long a book** ] did Alex read ___ ?

✱ *Chomsky's (1995) analysis*[13]
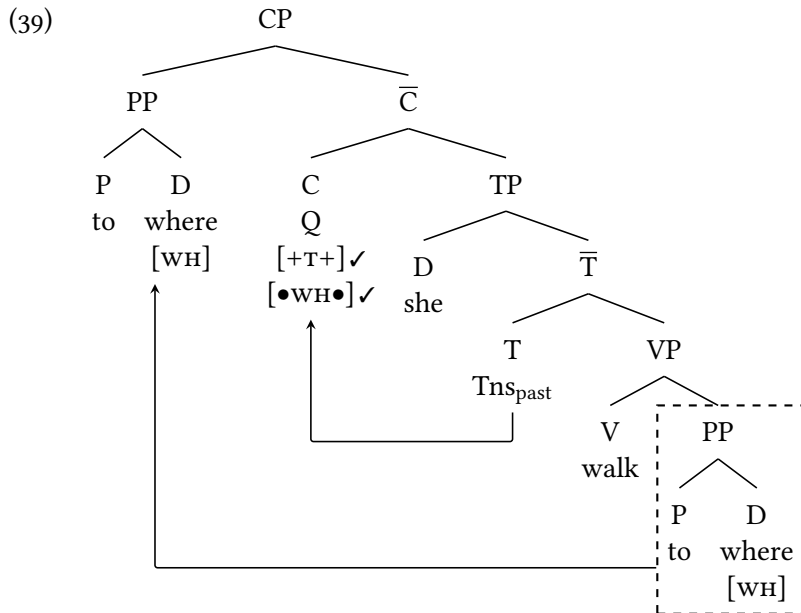
(37) **Convergence Principle**

A head which attracts a constituent containing a feature [F] attracts movement of the smallest accessible constituent containing [F] which will lead to a convergent derivation.

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[12] The term pied-piping comes from the folktale the *Pied Piper of Hamelin*, where a piper is hired to lure the rats out of the town with his magic pipe. When the villagers refuse to pay him, he uses his magic pipe to lure away all the children, never to be seen again.

[13] This analysis requires comparing derivations and picking the best one, a property which is called TRANS-DERIVATIONALITY. As far as I know, only OT really has a way of implementing transderivationality...

(38) **Stranding Constraint**                    *(only in Formal English)*
    Prepositions cannot be stranded.

(39)

```
                        CP
              ┌──────────┴──────────┐
             PP                     C̄
           ┌──┴──┐          ┌────────┴────────┐
          P     D          C                  TP
          to   where       Q              ┌───┴───┐
              [wh]        [+T+]✓          D        T̄
                          [•wh•]✓        she    ┌──┴──┐
                                                T      VP
                                             Tns_past ┌──┴──┐
                                                     V      PP
                                                   walk   ┌─┴─┐
                                                         P     D
                                                         to   where
                                                             [wh]
```
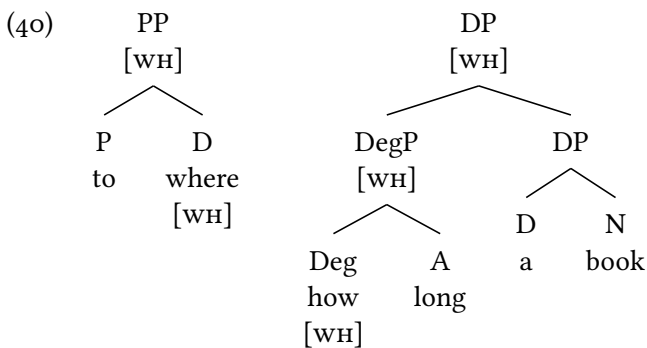
- **Application**
  The [•wh•] feature on C attracts a matching [wh] constituent that does not violate
  the Convergence Principle.

  – In (35), the entire PP must be *wh*-moved to satisfy the Stranding Constraint.

  – In (36), the entire DP must be *wh*-moved to satisfy whatever constraint blocks
    nonmaximal projections from undergoing phrasal movement.

* **Feature percolation**
  – Another common analysis of pied-piping is that there is some mechanism of
    FEATURE PERCOLATION that places features of a head H onto nodes outside the
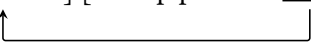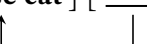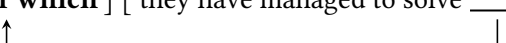    maximal projection of H:[14]

[14] Chomsky (1973); Cowper (1987); Webelhuth (1992); Grimshaw (2000).

(40)

```
        PP                          DP
       [wh]                        [wh]
      ┌──┴──┐              ┌─────────┴─────────┐
     P     D             DegP                  DP
     to   where          [wh]              ┌───┴───┐
         [wh]          ┌──┴──┐            D       N
                      Deg    A            a      book
                      how   long
                      [wh]
```
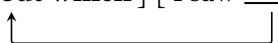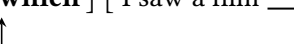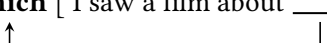
  – This is generally problematic: how far up can a feature percolate? See Heck (2004,
    2008, 2009) for discussion.

- ***Relative clauses***

  – Relative pronouns can also pied-pipe material along with them:

  (41)  a.  a box [$_{CP}$ [ **in which** ] [ I keep pictures ___ ] ]

  b.  a man [$_{CP}$ [ **whose cat** ] [ ___ likes lasagna ] ]

  c.  problems, [$_{CP}$ [ **none of which** ] [ they have managed to solve ___ ] ]

  d.  the inhabitants, [$_{CP}$ [ **pictures of whom** ] [ Maria had painted ___ ] ]

  – Interestingly, pied-piping in relative clauses is subject to optionality that cannot be reduced to different registers. For example, the first two of the following are both allowed in Formal English:

  (42)  a.  the Russian Revolution, [$_{CP}$ [ **a film about which** ] [ I saw ___ ] ]

  b.  the Russian Revolution, [$_{CP}$ [ **about which** ] [ I saw a film ___ ] ]

  c.  the Russian Revolution, [$_{CP}$ **which** [ I saw a film about ___ ] ]

## What to read if you want to learn more?

- Chomsky (1977): $\overline{\text{A}}$-movement

- Bhatt (2002) and Hulsey and Sauerland (2006): Raising vs. matching

- Heck (2008): In-depth study of pied-piping

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