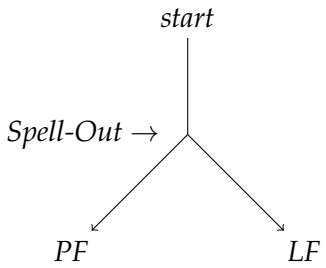
PF and Spell-Out

1 Overt vs covert movement

Last week: Some *wh*-in-situ (Japanese *wh-the-hell*) is sensitive to Ross's islands, even though nothing visibly moves. This motivates the idea of *covert movement*.
Two ways of thinking about overt vs covert movement:

- ***LF movement*** (May, 1977, 1985, a.o.):

  Some movements occur for interpretation but without affecting word order/pronunciation. Consider the *Y-model* of syntax: (this is a flow chart, not a tree)



  If movement happens in the *stem*/narrow syntax, it will affect both *Logical Form (LF)* and *Phonological Form (PF)*. Most syntactic operations that we've considered happen here.

  Covert movement is often called *Logical Form* or LF movement: The idea is that it happens after Spell-Out, only affecting the LF representation.

- ***Copy theory*** (Chomsky, 1995, a.o.):

  Movement is actually copying structure in the stem/narrow syntax, and then we decide how to pronounce these *chains* later.

  (1) a. Narrow syntax: *What* did John read *what*?
      b. English PF: *What* did John read ~~*what*~~?
      c. Hypothetical *wh*-in-situ PF: ~~*What*~~ (did) John read *what*?

  Under this view, overt and covert movements differ only at PF: Will the *highest* copy in the chain be pronounced (overt movement)? Or will the *lowest* copy be pronounced (covert movement)?

2 Multiple *wh*-fronting in Slavic

What happens if you have multiple *wh*-phrases in a question? The English case:

(2) John will give some book to some friend.

(3) a. *Which book* will John give ___ to *which friend*?

b. *Which friend* will John give *which book* to ___?

(4) a. * *Which book which friend* will John give ___ to ___?

b. * *Which friend which book* will John give ___ to ___?

Exactly one *wh*-phrase must be moved to Spec,CP, even if there are multiple *wh*-phrases.

(5) a. *What* will John give ___ to *who(m)*?

b. * *Who(m)* will John give *what* to ___?

If there are two *wh*-words (not *wh*-phrases), the higher must move. (Recall: This is Superiority, an NP asymmetry.)

In contrast to English, Bulgarian, Serbo-Croatian, Romanian, and Russian are all *multiple wh-fronting* languages. All data here is Bulgarian, mostly from Bošković (2002).

(6) a. *Koj kakvo* e kupil?
who what PAST bought
'Who bought what?'

b. * *Koj* e kupil *kakvo*?

c. * *Kakvo koj* e kupil?

(6) shows that Bulgarian requires both *wh*-phrases to move to the beginning of the question. (6b) shows that the lower *wh*-phrase cannot be in-situ; (6a) shows that the order of *wh*-phrases must obey Superiority. (7) shows that the same holds for long-distance movement.

(7) a. *Koj kakvo* misli Ivan [če ___ obuslavlja ___]?
who what thinks Ivan that conditions
'Who does Ivan think conditions what?'

b. * *Koj* misli Ivan če obuslavlja *kakvo*?

But something strange happens if the two *wh*-words are identical. Only one *wh*-word moves![1]

(8) a. * *Kakvo kakvo* obuslavlja?
what what conditions

[1] Snejana Iovtcheva (p.c.) tells me that the facts in Bulgarian are more complicated than described in Bošković (2002); in particular, examples such as (8) is grammatical for Snejana and some other Bulgarian speakers. I present judgments reported by Bošković here.

b. *Kakvo* obuslavlja *kakvo*?
what conditions what
'What conditions what?'

(9) a. * *Kakvo kakvo* misli Ivan če obuslavlja?
what what thinks Ivan that conditions
Intended: 'What does Ivan think conditions what?'

b. *Kakvo* misli Ivan če obuslavlja *kakvo*?

(10) *Kakvo* postojanno *kakvo* obuslavlja?
what always what conditions
'What always conditions what?' (Snejana Iovtcheva, p.c.)

Example (10) shows that multiple *wh*-fronting returns if an adverb can be added to break up the two identical *wh*-words.

Bošković (2002) argues that this data is best explained by the Copy Theory: *wh*-phrases all move, but then their pronunciation (highest or lowest copy) is decided at PF, after everything is built. In general, the highest copies are pronounced (all overt movements) but this is blocked if the result would have two homophonous *wh*-words right next to each other.

3 Phases, Spell-Out, and cyclic linearization[2]

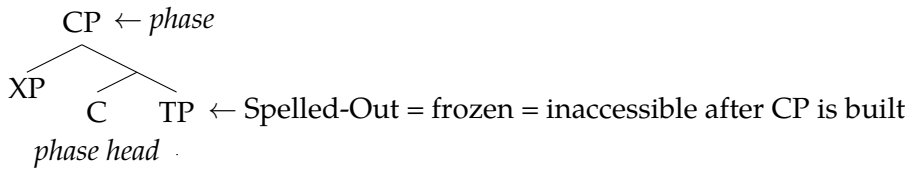
Last week: Long-distance (A' / *wh*) movement moves successive-cyclicly. (6 arguments)

(11) I wonder [$_{CP}$ *what* he says [$_{CP}$ ___ Laura hid ___]].

Why? Syntactic structure is built in "chunks," called *phases*. But still, the exact nature of phase-hood and how it forces successive-cyclic movement is a question.

3.1 The classic proposal

(12) **Phase Impenetrability Condition (Chomsky, 2000):**[3]
In phase α with head H, the domain of H is not accessible to operations outside α, but only H and its edge (specifiers).



[2] This presentation follows a handout by Danny Fox and David Pesetsky.
[3] Adger gives a version of the PIC in terms of the locality of feature-checking.

3.2 Cyclic linearization (Fox and Pesetsky, 2005)

Only the edge being accessible is explained by considering the process of *linearization*, the process of fixing word order.

Idea: The entire phase undergoes Spell-Out after it is built. *The relative order of words is fixed for each phase during Spell-Out*. Successive-cyclic movement is enforced by this.

(13) **One-fell-swoop movement yields an ordering paradox:**

* [$_{CP}$ What did he say [$_{CP}$ (that) Laura hid ___]]?

a. Linear order relations at embedded CP Spell-Out:
(*that*) < *Laura* < *hid* < *what*

b. Linear order relations at matrix CP Spell-Out:
what < *did* < *he* < *say* < CP

⇒ ordering paradox! (*what* < (*that*) < *Laura* < *hid* < *what*)

(14) **Successive-cyclic movement avoids an ordering paradox:**

✓ [$_{CP}$ What does he say [$_{CP}$ ___ (that) Laura hid ___]]?

a. Linear order relations at embedded CP Spell-Out:
what < (*that*) < *Laura* < *hid*

b. Linear order relations at matrix CP Spell-Out:
what < *did* < *he* < *say* < CP

⇒ no ordering paradoxes

Prediction: Movement is possible from the *non-edge* as long as you don't disrupt previously established orderings.

3.3 Holmberg's Generalization

Scandinavian languages are V2. When V moves to C, the object may move out of VP, crossing negation and adverbs. This is called *object shift*.

(15) **Object shift (Swedish):**

Jag kysste henne inte [$_{VP}$ t_v t_o]
I kissed her not

(16) **Object shift blocked because T moved to C, not the verb:**

a. * Jag har henne inte [$_{VP}$ kysst t_o].
I have her not kissed

b. Jag har inte [$_{VP}$ kysst henne].
I have not kissed her

(17) **Object shift blocked in a non-V2 clause:**

a. * ...att jag henne inte [$_{VP}$ kysste t_o]
...that I her not kissed

b. ...att jag inte [$_{VP}$ kysste henne]
...that I not kissed her

Holmberg (1998): "Less often mentioned, but no less true, is the fact that not just an unmoved verb, but any phonologically visible category inside VP preceding the object position will block Object Shift."

(18) **Object shift blocked by something else in the way:**

a. * Jag gav den inte [$_{VP}$ t_v Elsa t_o].
I gave it not Elsa

b. * Dom kastade mej inte [$_{VP}$ t_v ut t_o].
they threw me not out

c. * Jag talade henne inte [$_{VP}$ t_v met t_o].
I spoke her not with

(19) **Holmberg's Generalization according to Fox & Pesetsky:**

Object Shift cannot revise the relative order of the constituents in VP.

This is explained by VP being a phase and undergoing Spell-Out. Take the first two examples:

(20) **Grammatical object shift (15):**

✓[$_{CP}$ Jag kysste henne inte [$_{VP}$ t_v t_o]
I kissed her not

a. Linear order relations at VP Spell-Out:
kiss < her

b. Linear order relations at CP Spell-Out:
I < kiss(ed) < her < not

⇒ no ordering paradoxes

(21) **Ungrammatical object shift (16a):**

*[$_{CP}$ Jag har henne inte [$_{VP}$ kysst t_o].
I have her not kissed

a. Linear order relations at VP Spell-Out:
kiss < her

b. Linear order relations at CP Spell-Out:
I < have < her < not < kiss

⇒ ordering paradox! (her < kiss < her)

3.4 Erlewine on *that*-trace effects

(22) **The *that*-trace effect (Perlmutter, 1968):**

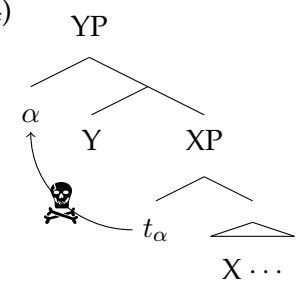
a. What did he say [$_{CP}$ (that) Laura hid ___]?

b. Who did he say [$_{CP}$ (*that) ___ hid the rutabaga]?

Idea 1: Movement from Spec,TP to Spec,CP is too close:

(23) **Spec-to-Spec Anti-Locality (Erlewine, 2014, 2016):**
A'-movement of a phrase from the Specifier of XP must cross a maximal projection other than XP.[4]

(24)



(25) a. * ... [$_{CP}$ ____ C [$_{TP}$ ____ ... *violates Spec-to-Spec Anti-Locality!*

b. ✓ ... [$_{CP}$ ____ C [$_{?P}$ (some extra material) [$_{TP}$ ____ ...

(26) **Intervening adverbs obviate *that*-trace effects (exx Culicover, 1993):**

a. This is the tree [$_{RC}$ that I said [$_{CP}$ that *(just yesterday) ___ had resisted my shovel]].

b. Robin met the man [$_{RC}$ {that/who} Leslie said
[$_{CP}$ that *(for all intents and purposes) ___ was the mayor of the city]].

(27) **Avoiding the anti-locality violation by skipping Spec,TP (Rizzi and Shlonsky, 2007):**

a. * What do you think [$_{CP}$ ___ that [$_{TP}$ ___ is [$_{Pred}$ ___ in the box]]]?

b. What do you think [$_{CP}$ ___ that [$_{TP}$ there is [$_{Pred}$ ___ in the box]]]?

Idea 2: The null complementizer allows for the subject to effectively be at the edge of the lower clause (Fox and Pesetsky, 2005), allowing extraction directly from Spec,TP:

(28) **One-fell-swoop movement of the subject over a null comp yields no paradox:**
✓ [$_{CP}$ Who did he say [$_{CP}$ $\emptyset_C$ [$_{TP}$ ___ hid the rutabaga]]]?

a. Linear order relations at embedded CP Spell-Out:
who < *hid* < *the rutabaga*

b. Linear order relations at matrix CP Spell-Out:
who < *did* < *he* < *say* < CP

⇒ no ordering paradoxes

[4] Movement from position α to position β *crosses* γ if and only if γ dominates α but does not dominate β.

(29) **One-fell-swoop movement of the subject over *that* yields an ordering paradox:**

* [$_{CP}$ Who did he say [$_{CP}$ that [$_{TP}$ ___ hid the rutabaga]]]?

a. Linear order relations at embedded CP Spell-Out:
that < *who* < *hid* < *the rutabaga*

b. Linear order relations at matrix CP Spell-Out:
who < *did* < *he* < *say* < CP

⇒ ordering paradox! (*who* < *that* < *who*)

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