Syntax
Minimality and (Strict) Cyclicity

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Phonology – Morphology – Syntax

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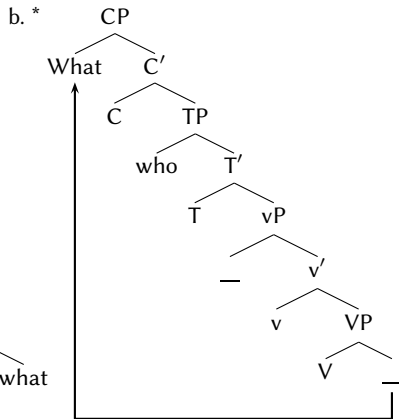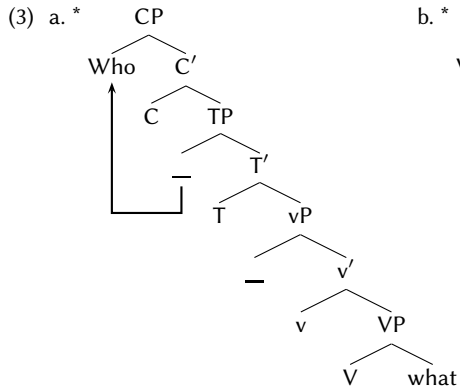home.uni-leipzig.de/heck

From Superiority to the MLC

Observation (Kuno and Robinson 1972):

- In English multiple questions, an object *wh*-phrase may not undergo *wh*-movement across a clause-mate subject *wh*-phrase (1-b). Rather, the subject must move to SpecC instead (1-a).
- This holds for short and long *wh*-movement alike (2-a,b).

(1) a. Who __ bought what?
     b. *What did who buy __?

(2) a. Who do you think [$_{CP}$ __ bought what]?
     b. *What do you think [$_{CP}$ who bought __]?

(3) a. * CP tree with Who, C′, C, TP, T′, T, vP, v′, v, VP, V, what

b. * CP tree with What, C′, C, TP, who, T′, T, vP, v′, v, VP, V

Moreover:

- A similar asymmetry holds for multiple questions that involve two *wh*-objects (Hendrick and Rochemont 1982, Pesetsky 1982, Barss and Lasnik 1986), see (4-a,b).

- Only the "higher" one of the two objects (in terms of c-command) may undergo *wh*-movement, the "lower" must stay put.

(4) a. *What did you persuade who [to read __]?
     b.   Who did you persuade __ [to read what]?

Aside:

- When it comes to illustrate superiority effects in English, typically the cases that involve *wh*-subjects are cited in the literature ((1), (2)).

- But as noted in Chomsky (1981), there seems to be a restriction in English against leaving a *wh*-subject in SpecT, cf. (5). This would already be enough to account for the ungrammaticality of superiority cases with subjects.

- Therefore, the cases involving superiority between objects are crucial (at least for English).

(5)   *Who believes [$_{CP}$ that who will win the price]?

From Superiority to the MLC

Classical account (Chomsky 1973):
Wh-movement is subject to the condition in (6), where the notion of "superiority" is usually interpreted in terms of asymmetric c-command.

(6)   *Superiority Condition:*
        No rule can involve X, Y in the structure
        . . . X . . . [. . . Z . . . WYV . . .] . . . ,
        where the rule applies ambiguously to Z and Y, and Z is superior to Y.

Note:
In fact, (6) is already formulated in a very general way, so as to apply to operations other than *wh*-movement (other types of movement, but also other rules such as agreement). Nevertheless, in the literature, (6) is usually associated with the particular constraint on *wh*-movement in multiple questions found in English (and some other languages).

From Superiority to the MLC

Modern re-interpretation:

- There is the general locality principle in (7) (Ferguson 1993, Chomsky 1995; cf. also Rizzi 1990, Fanselow 1991)

- The MLC blocks a lower β from establishing a grammatical relation with H across a c-commanding α if α and β could, in principle, both enter into the relation.

- The relation R between H and β that is blocked by the MLC is the probing by H (e.g., probing by C for a *wh*-phrase), not some Move operation that might be connected to it (e.g., *wh*-movement), see Doggett (2004).

(7)   *Minimal Link Condition (MLC):*
       If in a structure
       $\Sigma = H \ldots [\ldots \alpha \ldots [\ldots \beta \ldots] \ldots]$
   (where H c-commands α and β, and α asymmetrically c-commands β) both α and β are of the right type to establish a relation R with H, then H can establish R only with α (but not with β).

From Superiority to the MLC

Superiority generalized:

- MLC-effects are not confined to *wh*-movement in English.
- For instance, if movement to subject position is triggered by a [uN] feature on T, then why does it have to be NP_{ext} that moves to SpecT, and not, e.g., NP_{int} (in a transitive clause)?

(8)   a.   Dr. Brumm at the honey.
      b.   *The honey ate Dr. Brumm.

(9)   a.
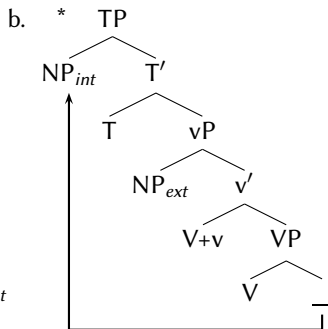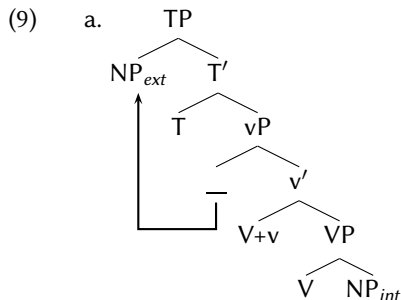
Raising to subject and the MLC:

- The ungrammaticality of (8-b) follows directly from (6)/(7) (where X/H = T, Z/α = NP$_{ext}$, and Y/β = NP$_{int}$).
- Assuming instead that only nominative marked NPs can undergo raising to subject in English ("case discrimination", Bobaljik 2008) seems to shift the problem: Under this assumption, the question is why NP$_{int}$ cannot check/value nominative on T (and NP$_{ext}$ accusative on v).
- And this question may receive the same answer: NP$_{ext}$ is closer to T than NP$_{int}$, and therefore it is NP$_{ext}$, which checks/values case on T.
- But note that NP$_{int}$ is already present when v is merged. Thus, one may argue that because the case probe on v must be checked/valued immediately NP$_{int}$ is valued accusative and thus cannot be valued by T later. If movement to SpecT is case-discriminating, NP$_{int}$ cannot raise for indepedent reasons.
- However, there are many other cases that suggest that the MLC is a very general principle of grammar.

Raising across experiencer: Icelandic

Raising across experiencer and the MLC:

- Raising of an embedded nominative argument across a dative-marked argument in the matrix clause is prohibited in Icelandic, see (10-a) (Sigurðsson 1996, McGinnis 1998, Holmberg and Hróarsdóttir 2003).

- This follows from the MLC if the experiencer is part of the matrix VP. Without experiencer, raising is grammatical (10-b).

(10)   a.   *Hestarnir   virðast mér   [_ vera seinir].
            the.horses.NOM seem   me.DAT   be   slow
            'The horses seem to me to be slow.'

       b.   Hestarnir   virðast [_ vera seinir].
            the.horses.NOM seem   be   slow
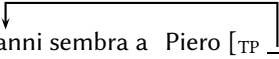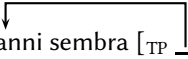   'The horses seem to me to be slow.'

But:
Is the argument based on (10-a,b) really so straightforward?

Raising across experiencer: Italian
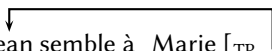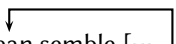
Observation (Rizzi 1986):

- Subject-raising out of an embedded infinitive across an experiencer leads to ungrammaticality in Italian, too, see (11-a).

- If no experiencer is present, subject-raising is fine (11-b). This suggests that the problem in (11-a) is caused by the presence of the experiencer *a Piero*.

(11)   a. *?Gianni sembra a Piero [_TP_ _ fare il suo dovere].
           Gianni seems to Piero   to.do the his duty
           'Gianni seems to Piero to do his duty.'

    b. Gianni sembra [_TP_ _ fare il suo dovere].
       Gianni seems   to.do the his duty
       'Gianni seems to do his duty.'

Note:
The same can be observed in French (Chomsky 1995).
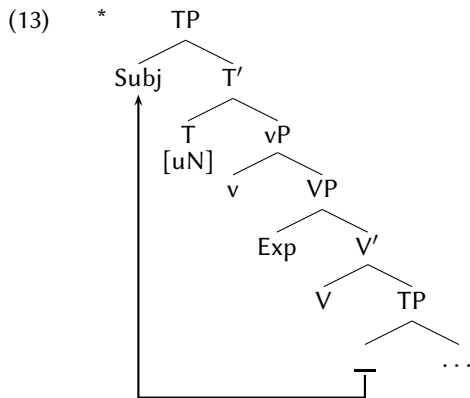
(12)   a.   *Jean semble à Marie [$_{TP}$ _ avoir du   talent].
              Jean seems to Marie   have of.the talent
              'Jean seems to Marie to be gifted.'

        b.   Jean semble [$_{TP}$ _ avoir du   talent].
              Jean seems   have of.the talent
              'Jean seems to be gifted.'

Question:
Why is the argument more straightforward with respect to Italian and French, as opposed to Icelandic?

Analysis:

(13) *

Note:

- In contrast to Icelandic, Italian and French do not allow for a dative experiencer to move to SpecT for independent reasons (case-discrimination!), cf. (14).

- Yet, they act as interveners for attraction of a lower argument. Chomsky (2000) calls this "defective intervention".

(14) *[A Marie] semble ⌐ [$_{TP}$ Jean avoir du   talent].
         to Marie   seems   Jean have of.the talent
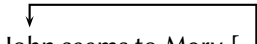   'Jean seems to Marie to be gifted.'

Possible interpretation:
The intervener does not have the full set of features necesssary to satisfy the probe. However, having a subset of these features is already sufficient to stop probing beyond the intervener.
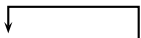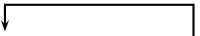
Raising across experiencers

Note:

Curiously enough, English does not exhibit this constraint against raising across an experiencer, see (15). Exceptions such as (15) raise the question as to whether the MLC is really a general principle (or a principle at all) of the grammar.

(15)   John seems to Mary [_ to do his duty].

Scandinavian Object Shift

Object shift (Vikner 1989, Collins and Thráinsson 1996, Collins 1997):

- Unstressed pronouns in Danish (and Scandinavian more generally) undergo a movement operation called object shift, see (16-a).
- However, such object shift is only possible if there is no higher object that does not shift itself (because it is a full NP), see (16-b). This follows from the MLC.

(16)   a.   Peter viste   hende jo   ＿ bogen
                Peter showed her   indeed   the.book
                'Peter indeed showed her the book.'

        b.   *Peter viste   den jo   Marie ＿.
                Peter showed it   indeed Marie
   'Peter indeed showed it to Marie.'

Note:
Again, the full NP in (16-b) acts as a defective intervener. Although it cannot undergo object shift in Danish, it blocks object shift of a lower weak pronoun.

Scandinavian Object Shift

Analysis:
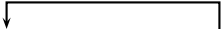
- OS is triggered by a [uN] feature on v. Since NP_{IObj} is merged in SpecV, it asymmetrically c-commands NP_{DObj} and therefore blocks OS of the latter via the MLC.
- Recall: The relation between v and NP_{DObj} that is blocked by the MLC is the probing by [uN] (not Object Shift as such).

(17) *
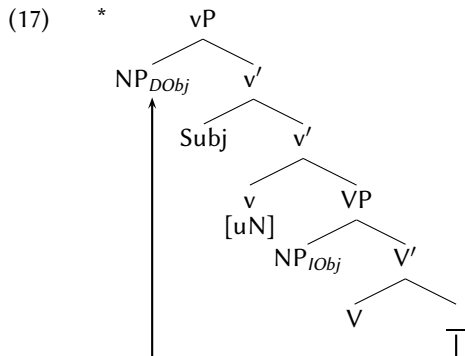
Hyperraising

Hyperraising in Turkish (Moore 1998):

- Some dialects of Turkish allow for raising out of finite clauses (18-a). *pro* in (18-a) is a phonetically empty pronoun.
- If there is an intervening subject (raising applies across another clause), such raising is blocked (18-b). (That raising takes place in (18-b) is motivated by long-distance agreement.)

(18)   a.   Biz   san-a   [CP *t* süt   iç-ti-k   ] gibi
                we.NOM you-DAT   milk drink-PRET-1PL like
                görün-dü-k.
                appear-PRET-1PL
                Lit. 'We appeared to you that we have drunk milk.'

        b. *pro* [CP *pro* [CP *t* çok   viski   iç-ti-m   ]
             1SG   2SG   much whiskey drink-PRET-1SG
             san-dı-n   ] gibi görün-dü-m.
             think-PRET-2SG like appear-PRET-1SG
             Lit. 'I appear that you believe that I drank much whiskey.'

Hyperraising

Note:

- Hyperraising in Turkish does not seem to be sensitive to an intervening experiencer (*sana*, 'you.DAT' in (18-a)); cf. (15).
- One could as well interpret (18-b) as a violation of the MLC caused by probing for ϕ-features (ϕ-agreement).

(19) *
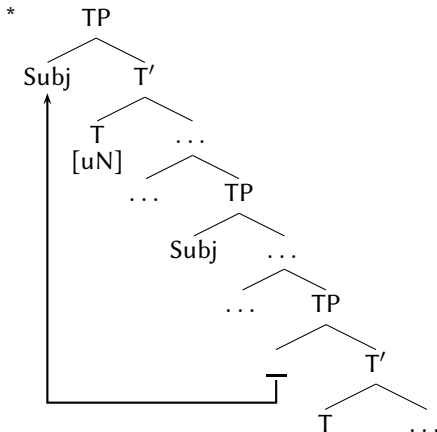
Head Movement

Head movement (Rizzi 1990, 2001):
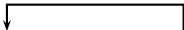
- In Italian, both gerundive and participles can in principle move to C (20-a,b). However, if both gerundive and participle are part of the same clause, the lower participle cannot move to C, thereby crossing the higher gerundive (20-c).
- In contrast, the higher gerundive can move to C also in the presence of a lower participle (20-a). This follows if head movement to C is subject to the MLC.

(20)   a.   Essendo Mario *t* tornato a Milano, ...
            being   Mario   returned to Milano
            'Mario, having returned to Milano, ...'

       b.   Tornato Mario *t* a Milano , ...
            returned Mario   to Milano
            'Mario, returned to Milano, ...'

       c.   *Tornato Mario essendo *t* a Milano, ...
            returned Mario being   to Milano

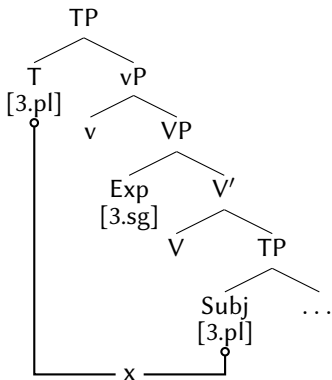# MLC and Agree

Recall:

- As already noted, the MLC does not restrict movement itself but rather the probing that connects the movement inducing probe with the goal. Accordingly, Agree relations that do not involve movement should also be subject to the MLC. This is indeed the case.

- In Icelandic, agreement with the nominative subject of an embedded infinitive is blocked by an intervening dative experiencer (21-a) (Watanabe 1993, Schütze 1993, Sigurðsson and Holmberg 2008, Kučerová 2016). If the intervener moves, agreement is fine (21-b).

(21) a. það virðist/*virðast   einhverjum manni [$_{TP}$ hestarnir
     EXPL seem.3SG/seem.3PL a.DAT   man.DAT   horses.NOM
     vera seinir].
     be slow
     'Some man seem the horses to be slow.'

   b. Mér   virðast ⌐ [$_{TP}$ hestarnir   vera seinir].
     me.DAT seem.3PL   horses.NOM be slow
     'The horses seem to me to be slow.'

MLC and Agree

Analysis:

(22)

Note:

- Note that a dative argument can never agree with T in Icelandic: "defective intervention".
- Sometimes, it is doubted that the problem with (21-a) is due to agreement itself. Bobaljik (2008) claims that the agreeing variant of (21-a) is ungrammatical because of an inaudible (covert) movement of the nominative subject across the dative experiencer.
- If Bobaljik (2008) is right, then (21-a) provides evidence for the MLC in terms of movement, not in terms of Agree.

The Transformational Cycle

The cycle:

- In the Minimalist Program, the generation of syntactic structure by (external) Merge applies in a buttom-up fashion. As a consequence, operations such as Agree (and Move) can only refer to information that has already been integrated into the tree by (external) Merge.

- For instance, a goal γ cannot enter into Agree with a probe β if β has not yet been merged in a position where it c-commands γ (23-a,b) vs. (23-c):

- In this sense, every node created by Merge constitutes a cyclic domain.

(23) a. Ψ $\Rightarrow$ b. Φ $\Rightarrow$ c. Δ
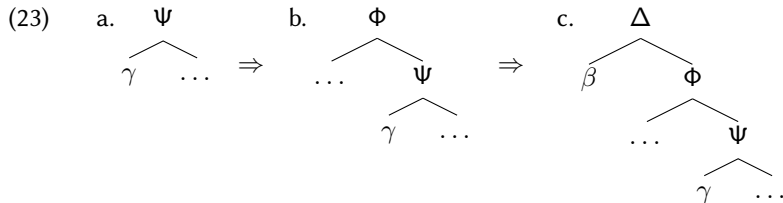
In the early days . . .

- . . . things were different (e.g, Chomsky 1965, Chomsky 1981): all structure building preceded all movement operations (and other transformations).
- There was an extra principle, called the "transformational cycle" (alternatively the "cyclic principle"), see (24), to derive the same effect that one gets for free in the new theory. Also, back then one had to define what counts as a cyclic node (and what does not).

(24)   *The transformational cycle:*
        Given a structure $[_\alpha \ldots [_\beta \ldots] \ldots]$, where α and β are cyclic nodes. Then all rules of grammar first must get the chance to apply within β, and only after this within α.

Note:

- The definition of Merge, here repeated in (25), does not prevent the possibility that some element α becomes merged to a position that is properly contained by a subtree Ψ of the current tree Φ.

- This is because the definition says nothing about the properties of β. It may either be the case that $\beta = \Phi$, or it may be that β is containted in Φ, i.e., $\beta = \Psi$.

(25)   *Merge*:
        Merge takes two terms α and β and combines them. The result is a new term $\gamma = \{\alpha, \beta\}$. (Merge($\alpha$, β) $\rightarrow$ $\{\alpha, \beta\}$ (=γ))

(26)   *Term*:
        α is a term iff a. or b. hold
        a. α is a lexical item.
        b. α has been generated by a previous application of Merge.

Strict Cyclicity/ Extension Condition

*Strict Cyclicity/Extension Condition*:

- It is been proposed that there is a restriction on Merge such that α and β can only be merged if they are root nodes (in other words: $\beta = \Phi$, where Φ is the current tree under construction).

- This property of Merge is called the Extension Condition (Chomsky 1993, 1995), see (27).

- (27) is closely related to what was called the Strict Cycle Condition in earlier stages of the theory (Chomsky 1973), see (28), illustrated by (29).

(27) *Extension Condition (EC)*:
      Merge always applies at the root.

(28) *Strict Cycle Condition (SCC)*:
      No rule can apply to a domain dominated by a cyclic node A in such a way as to affect solely a proper subdomain of A dominated by a node B which is also a cyclic node.

Strict Cyclicity/ Extension Condition

(29)
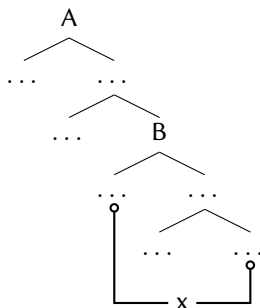
Comment:
The relation between the two positions within the domain B, indicated in (29) (which could be movement or agreement), violates the SCC because B is a cyclic node (by assumption) which is dominated by another cyclic node A.

Strict Cyclicity/ Extension Condition

Further comments:

- The SCC is quite general. It covers all kinds of operations (Merge, Move, Agree). In contrast, the EC exclusively refers to Merge.

- The definition in (28) leaves open which nodes are cyclic. In principle, this could be particular categories (e.g., CP), all phrases, or every node. In contrast, for the EC every node is a cyclic node.

- Note that the SCC and the cyclic principle are not the same. One may imagine a situation where the possibility to apply an operation O in a lower cyclic domain only comes into existence after a higher cyclic domain has been created. Applying O would be allowed by the cyclic principle, but not by the SCC.

- Both the EC and the SCC depend on the existence of the transformational cycle: if there were no cyclic principle, then it would not be possible to apply any operation that ends up to affect only a proper subpart of the ultimate output tree.

Strict Cyclicity/ Extension Condition
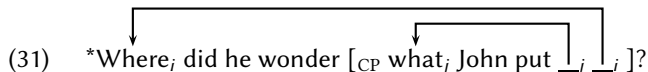
... *(continued)*:

- The SCC also prohibits what the EC does, namely Merge at the non-root of a tree. The step from (30-b) to (30-c), which merges α at some position *inside* the already constructed tree Ψ, violates both EC and SCC (i.e., $\beta = \Psi \neq \Phi$).

(30)   a. Ψ $\qquad$ b. Φ $\qquad$ c. * Φ

... ... $\Rightarrow$ ... Ψ $\Rightarrow$ ... Δ

... ... α Ψ

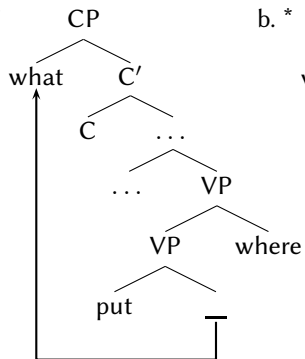... ...
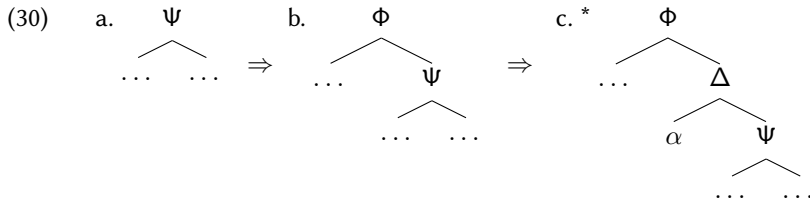
An early argument for the SCC (Chomsky 1973):

- In order to account for the ungrammaticality of (31), all derivations that could generate (31) must violate some principle of grammar.
- The derivation in (32) violates superiority/MLC twice (in (32-a) *where* is closer to the embedded C than *what*; in (32-b) *what* is closer to the matrix C than *where*), and is therefore properly ruled out.
- However, the derivation in (33) satisfies superiority/MLC at every step. Crucially, this derivation is ruled out by the SCC (movement of *what* to the embedded SpecC is counter-cyclic), thus providing motivation for strict cyclicity.

(31)   *Where$_i$ did he wonder [$_{CP}$ what$_j$ John put __$_j$ __$_i$]?

(32) a. *

CP
- what
- C′
  - C
  - . . .
    - . . .
    - VP
      - VP
        - put
      - where

b. *

CP
- where
- C′
  - C
  - . . .
    - . . .
    - CP
      - what
      - . . .
        - . . .
        - VP
          - VP
            - put

Minimality and Strict Cyclicity

(33) a.

b. *
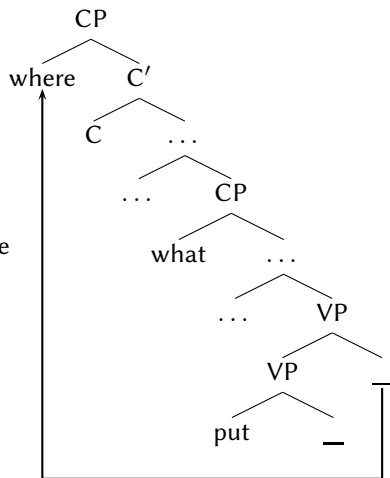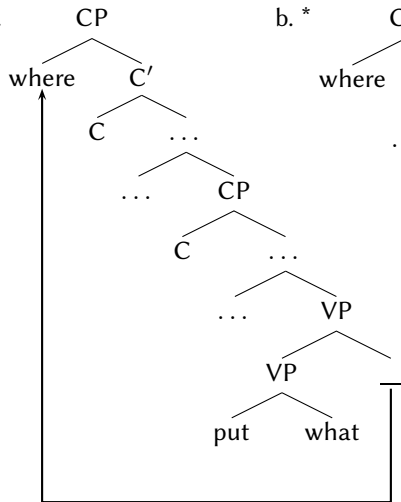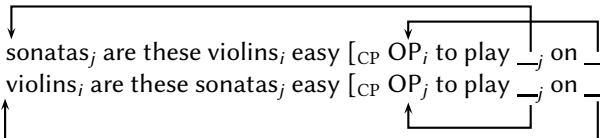
Note:

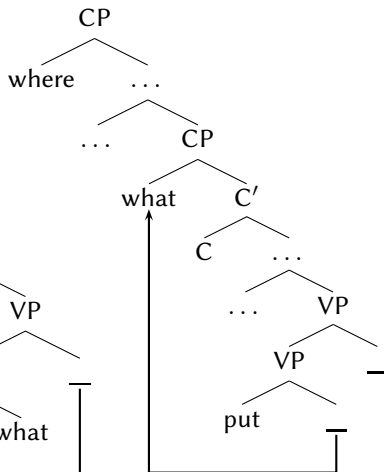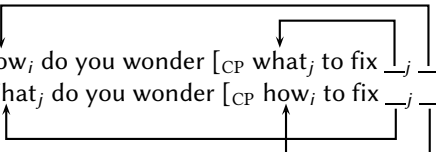- In its present form, the argument does not go through under more modern assumptions (which have to do with how movement out of CP proceeds; we come back to this when we talk about phase theory).
- But it can be adapted to the modern theory. In what follows, we further adapt an argument made in Kitahara (1994, 1997) to a modern view of syntactic theorizing. (Kitahara's argument slightly differs from the presentation that follows.)

Nested vs. crossing paths

Pesetsky (1982):
For many speakers examples like (34-b)/(35-b), which involve embedded non-finite *wh*-clauses, are "almost completely acceptable" and contrast sharply with examples such as (34-a)/(35-a) (see also Chomsky 1981, 310, Chomsky 1986, Frampton 1990, Boyd 1992, Manzini 1992).

(34) a.*Which sonatas$_j$ are these violins$_i$ easy [$_{CP}$ OP$_i$ to play __$_j$ on __$_i$]?
      b. Which violins$_i$ are these sonatas$_j$ easy [$_{CP}$ OP$_j$ to play __$_j$ on __$_i$]?

(35) a.*How$_i$ do you wonder [$_{CP}$ what$_j$ to fix __$_j$ __$_i$]?
      b. What$_j$ do you wonder [$_{CP}$ how$_i$ to fix __$_j$ __$_i$]?

Nested vs. crossing paths

Preminger (2009) (also Reinhart 1981):
The same state of affairs can be observed for Modern Hebrew, were
wh-movement is even possible out of a finite *wh*-clause.

(36)   a.   Ɂet-ma$_i$ Dan šaxax [$_{CP}$ mi$_j$ __$_j$ axal __$_i$]?
            ACC-what Dan forgot   who   ate
            lit: 'What did Dan forget who ate?'
       b.   *mi$_j$ Dan šaxax [$_{CP}$ Ɂet-ma$_i$ __$_j$ axal __$_i$]?
            who Dan forgot   ACC-what ate

(37)   a.   Ɂet-ma$_i$ Dan šaxax [$_{CP}$ le-mi$_j$ siparti __$_j$ [$_{CP}$ še-Rina
            ACC-what Dan forgot   DAT-who told.1SG   that-Rina
            axla __$_j$]]?
            ate
            lit: 'What did Dan forget to whom I told that Rina ate?'
       b.   *le-mi$_j$ Dan šaxax [$_{CP}$ Ɂet-ma$_i$ siparti __$_j$ [$_{CP}$ še-Rina
            DAT-who Dan forgot   ACC-what told.1SG   that-Rina
            axla __$_i$]]?
            ate

Interpretation:

- Background assumption: Movement out of a CP (as by *which violins* in (34-b)) must make an intermediate touch-down in SpecC (Chomsky 1977, Reinhart 1981, Comorovski 1986, Rudin 1988, Richards 1997, Chomsky 2000, 2001).

- The grammaticality of (34-b) then suggests that English infinitives provide a second SpecC-position that allows *which violins* to move out of CP: the first SpecC is already occupied by the (phonetically empty) operator OP. This is shown in (38-b).

Note: "w-v" = *which violins*

(38)   a.   b.
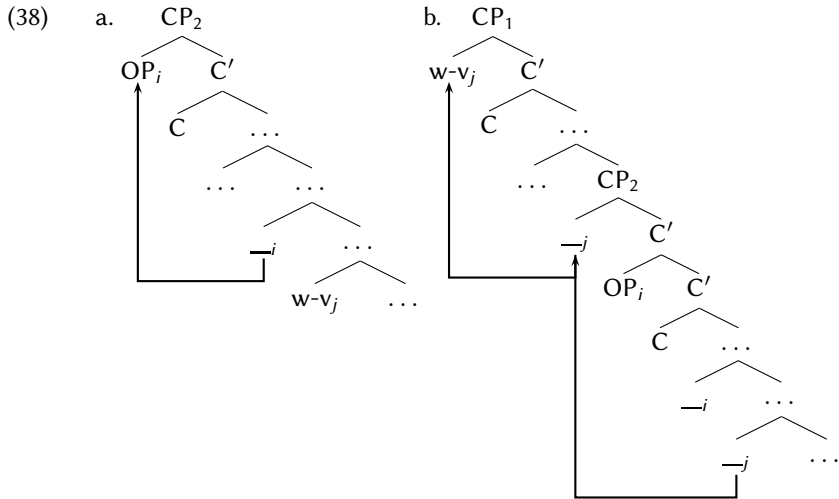
Excursus: Leapfrogging

Leapfrogging:

- In the first step in (38-b), *which violins* can skip over the empty operator without violating the MLC because OP is no longer c-commanded by C when *which violins* is probed. (Note: both the *wh*-phrase and OP are assumed to be probed by the C-head.)

- In this way, *which violins* then moves to an outer SpecC-position, where it is not c-commanded by OP. In this outer SpecC-position, it can then be probed by the higher C-head without OP intervening (the second step in (38-b)).

- Thus, such intermediate movement to a position right above a potentially intervening element (which is called "leapfrogging" or "hurdling", see Bobaljik 1995, McGinnis 1998, Doggett 2004) is a way to avoid MLC-violations.

- Clearly, this work-around requires that the head that hosts the possible intervener can probe (and thus attract) the phrase that is supposed to move past the intervener.

The next step:

- The ungrammaticality of (34-a) must be accounted for.
- This is done by showing that every possible derivation violates some principle of grammar.
- As argued by Kitahara (1994, 1997), this follows from the MLC and, the crucial point here, its interaction with the SCC.

Nested vs. crossing paths

(39) a. *

Note: The first step (39-a) violates the MLC.

Nested vs. crossing paths

(40) a. CP$_2$

b. * CP$_1$

Note: The third step (40-b) violates the MLC.

Nested vs. crossing paths

(41)   a. CP$_2$ b. *   CP$_1$
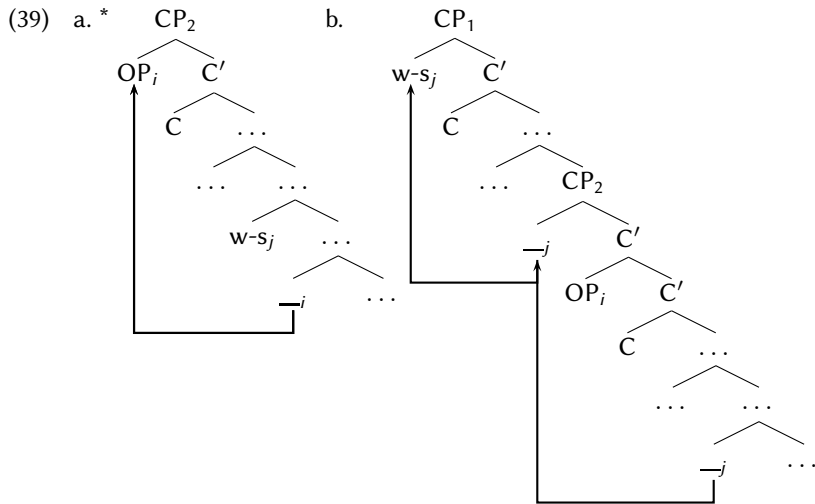
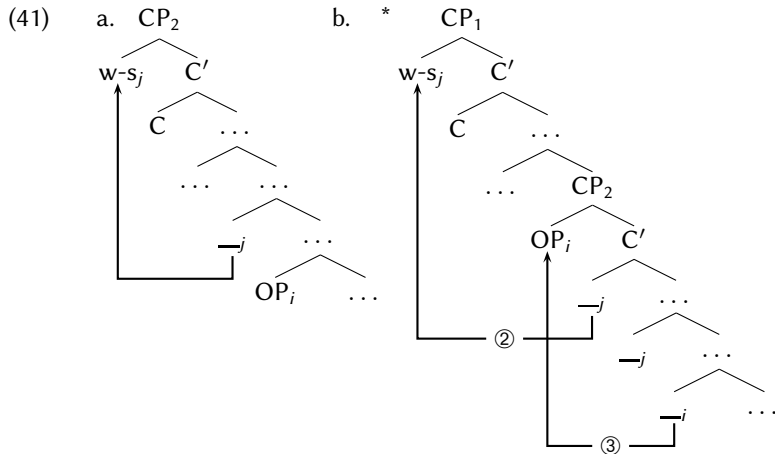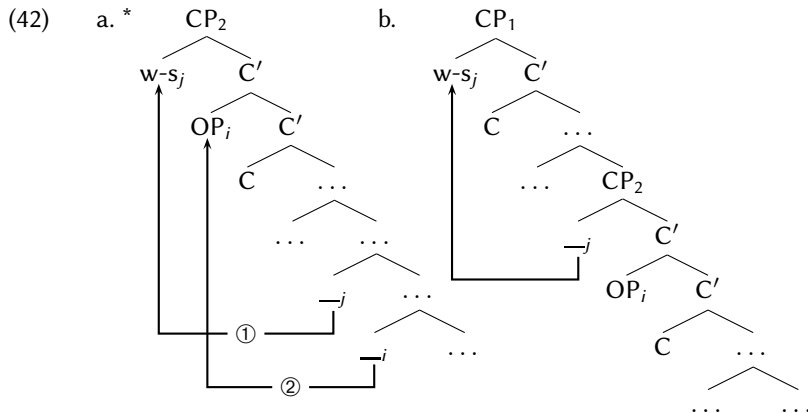*Note:* The third step in (41-b) violates the SCC. Assuming phase theory (see next set of slides), (41) could be blocked without assuming the SCC. However, this is not the case for the last derivation, in (42).

(42)   a. *

b.

Note: The second step (42-a) violates the SCC.

Excursus: Tucking-In

Note:

- The violation of the SCC in the second step in (42-a) is "minimal" in some intuitive sense: movement targets not the root, creating an outermost specifier, but a node that belongs to the topmost projection, thereby creating an inner specfier.

- In many theoretical proposals, such a violation of the SCC is assumed to be acceptable (or even necessary). It goes under the name "tucking-in" (see Richards 1997, 1999; cf. also Mulders 1997 for the concept).

- The fact that the tucking-in derivation in (42) undermines the Kitahara-style explanation of the ungrammaticality of (34-a) may serve as a potential argument against tucking-in (and in favor of a strict interpretation of the SCC, Heck 2018).

Counter-cyclic external Merge

Observation:

- Another motivation for the SCC comes from the simple fact that the MLC can be systematically undermined by counter-cyclic external Merge if there is no SCC.
- For instance, there is a derivation for raising "across" an experiencer in French that respects the MLC because the dative experiencer is merged counter-cyclically:

(43) a.
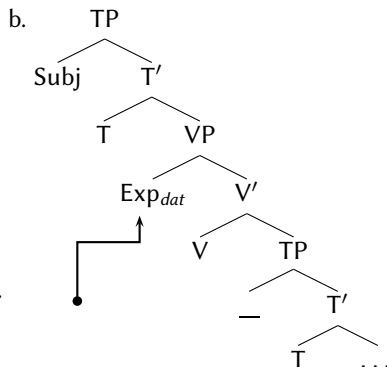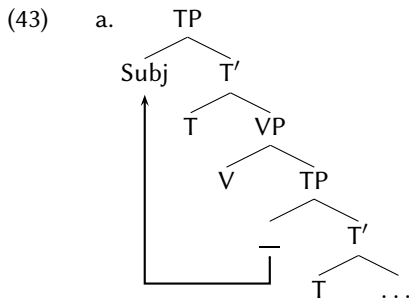
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