

# Syntax

## Minimality and (Strict) Cyclicity

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Phonology – Morphology – Syntax

Institut für Linguistik

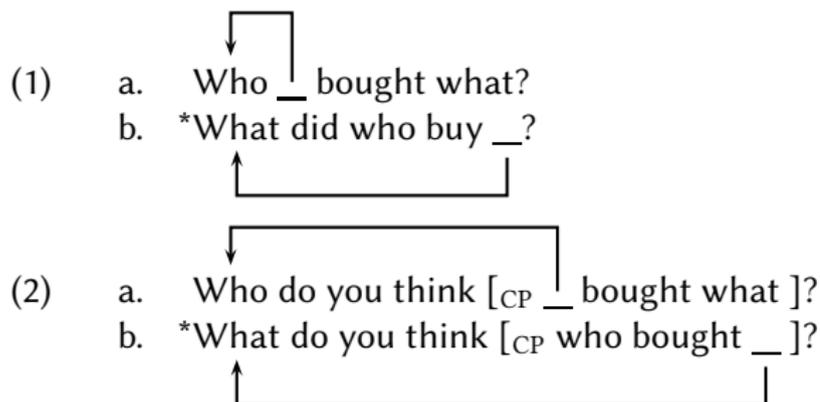
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# From Superiority to the MLC

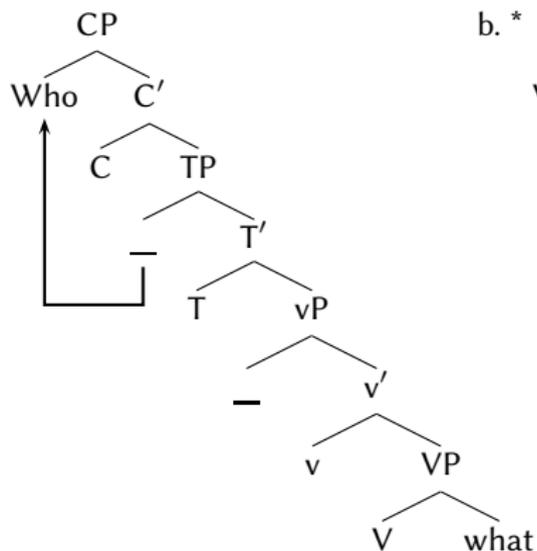
*Observation (Kuno and Robinson 1972):*

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

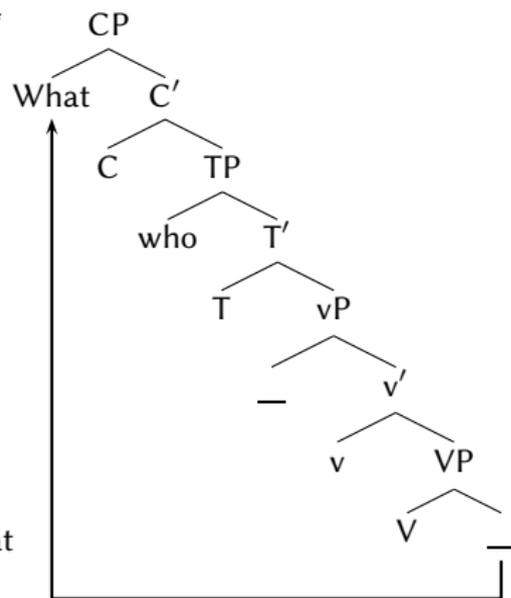


# From Superiority to the MLC

(3) a. \*



b. \*



# From Superiority to the MLC

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 ]?
-

# From Superiority to the MLC

*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. 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 [<sub>CP</sub> 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 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 multiple *wh*-movement 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  $\beta$  from establishing a grammatical relation with H across a c-commanding  $\alpha$  if  $\alpha$  and  $\beta$  could, in principle, both enter into the relation.
- The relation R between H and  $\beta$  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

$$\Sigma = H \dots [\dots \alpha \dots [\dots \beta \dots] \dots]$$

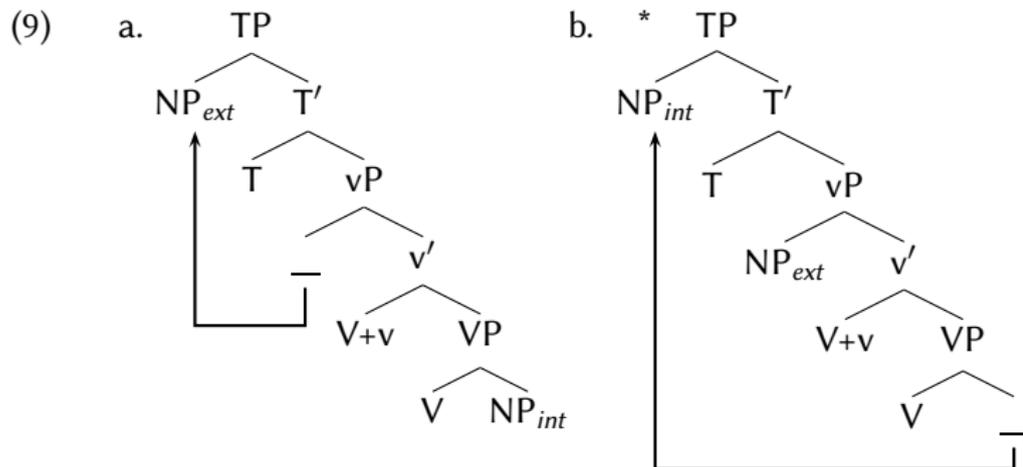
(where H c-commands  $\alpha$  and  $\beta$ , and  $\alpha$  asymmetrically c-commands  $\beta$ ) both  $\alpha$  and  $\beta$  are of the right type to establish a relation R with H, then H can establish R only with  $\alpha$  (but not with  $\beta$ ).

# 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<sub>ext</sub> that moves to SpecT, and not, e.g., NP<sub>int</sub> (in a transitive clause)?

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



# Raising to SpecT

## *Raising to subject and the MLC:*

- The ungrammaticality of (8-b) follows directly from (6)/(7) (where  $X/H = T$ ,  $Z/\alpha = NP_{ext}$ , and  $Y/\beta = NP_{int}$ ).
- Assuming instead that only nominative marked NPs can undergo raising to subject 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.
- 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 independent reasons.
- However, there are many other cases that suggest that the MLC is a very general principle of grammar.

# 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 (10-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 (10-b). This follows from the MLC.

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



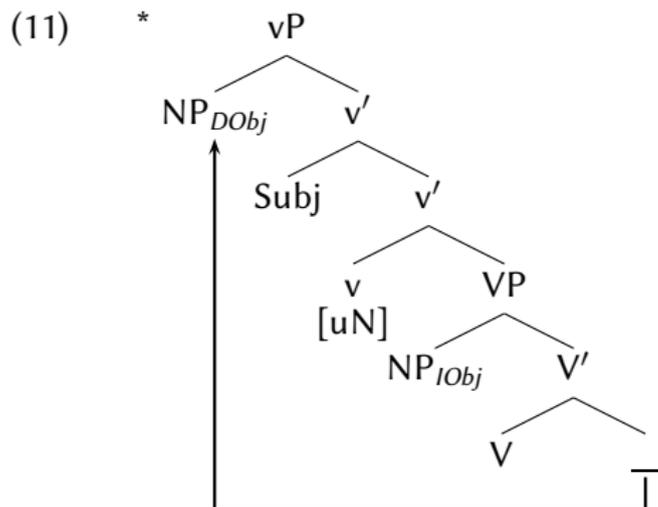
b. \*Peter viste den jo Marie           .  
Peter showed it indeed Marie  
'Peter indeed showed it to Marie.'



# 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).



# Raising across experiencers

*Observation (Rizzi 1986):*

- Subject-raising out of an embedded infinitive across an experiencer leads to ungrammaticality in Italian (12-a).
- If no experiencer is present, subject-raising is fine (12-b). This suggests that the problem in (12-a) is caused by the presence of the experiencer *a Piero*.

- (12) 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.'

# Raising across experiencers

*Note:*

The same can be observed in other languages, e.g., French (Chomsky 1995), Icelandic (McGinnis 1998, Holmberg and Hróarsdóttir 2003).

(13) 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.'

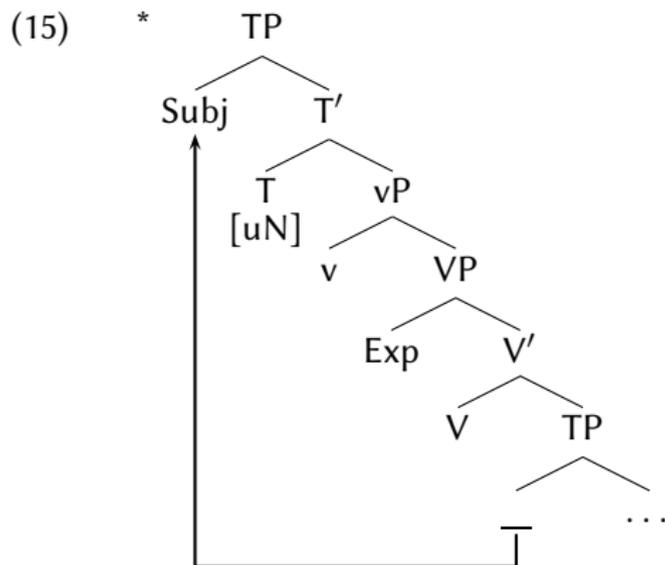
(14) a. \*Ólafur virðist mér [TP          vera gáfaður ].  
Olaf.NOM seems me.DAT to.be intelligent  
'Olaf seems to me to be intelligent.'

b. Ólafur virðist [TP          vera gáfaður ].  
Olaf.NOM seems to.be intelligent  
'Olaf seems to be intelligent.'

# Raising across experiencers

## Analysis:

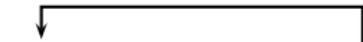
- As assumed, raising is triggered by a [uN] feature on T. Perhaps surprisingly, constituents that look like PPs in Romance (e.g., *à Marie* in French) appear to be able to block such NP-raising.
- Either these experiencers *are* NPs (despite superficial appearance), or they are sufficiently similar to NPs to block the probing by [uN].



# Raising across experiencers

*Note:*

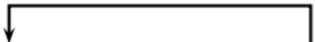
Curiously enough, English does not exhibit this constraint against raising across an experiencer, see (16). Exceptions such as (16) raise the question as to whether the MLC is really a general principle (or a principle at all) of the grammar.

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

# Hyperraising

*Hyperraising in Turkish (Moore 1998):*

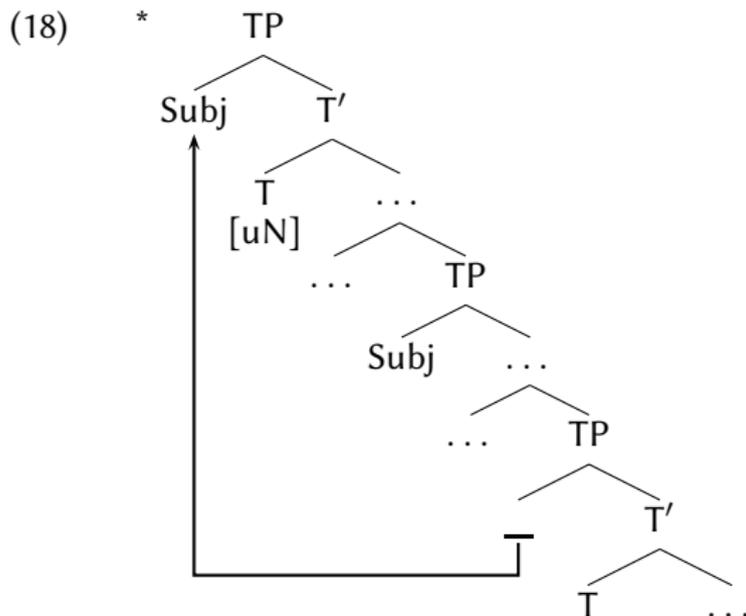
- Some dialects of Turkish allow for raising out of finite clauses (17-a). *pro* in (17-a) is a phonetically empty pronoun.
- If there is an intervening subject (raising applies across another clause), then hyperraising is blocked (17-b). (That hyperraising takes place in (17-b) is motivated by the fact that the matrix T agrees with the embedded subject *pro*.) This derives from the MLC.

- (17) a.  Biz san-a [<sub>CP</sub> 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* [<sub>CP</sub> *pro* [<sub>CP</sub> t çok viski iç-ti-m ] ] gibi görün-dü-m.  
1SG 2SG much whiskey drink-PRET-1SG  
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 (17-a)); cf. (16).
- Turkish is head-final. This is ignored in (18).



# Head Movement

*Head movement (Rizzi 1990, 2001):*

- In Italian, both gerundive and participles can in principle move to C (19-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 (19-c).
- In contrast, the higher gerundive can move to C also in the presence of a lower participle. This follows if head movement to C is subject to the MLC.

- (19)
- 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

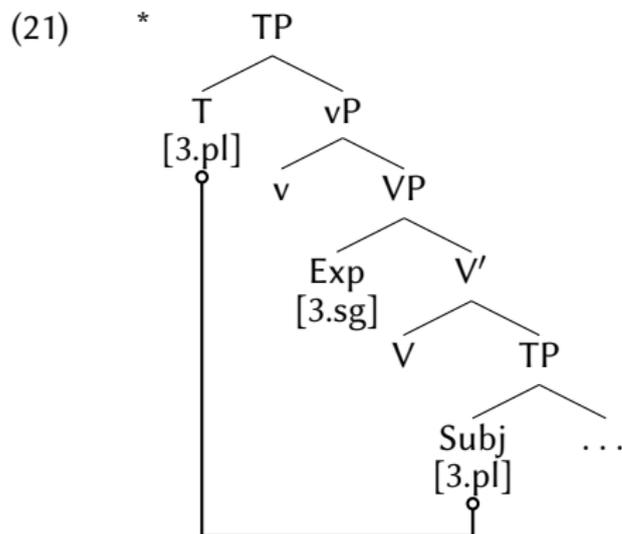
*Recall:*

- 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 (20-a) (Watanabe 1993, Schütze 1993, Sigurðsson and Holmberg 2008, Kučerová 2016). If the intervener moves, agreement is fine (20-b).

- (20) 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:*



# MLC and Agree

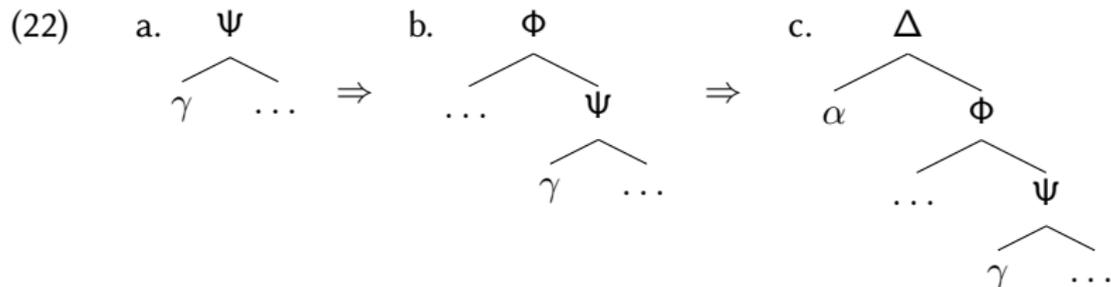
*Note:*

- In fact, a dative argument can never agree with T in Icelandic. It therefore comes as a surprise that the dative seems to block agreement. Chomsky (2000) therefore calls this phenomenon “defective” intervention.
- Sometimes, it is doubted that the problem with (20-a) is due to agreement itself. Bobaljik (2008) claims that the agreeing variant of (20-a) is ungrammatical because of a inaudible (covert) movement of the nominative subject across the dative experiencer.
- If Bobaljik (2008) is right, then (20-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 bottom-up fashion. As a consequence, operations such as Agree (and Move) can only refer to information that has already been incorporated into the tree by (external) Merge.
- For instance, a goal  $\gamma$  cannot enter into Agree with a probe  $\alpha$  if  $\alpha$  has not been merged in a position where it c-commands  $\gamma$ :
- In this sense, every node created by Merge constitutes a cyclic domain.



# The Transformational Cycle

*In the early days . . .*

- . . . things were different (e.g, Chomsky 1965, Chomsky 1981): all structure building preceded all movement operations (and other transformations).
- The principle of the transformational cycle (also called the “cyclic principle”) was defined explicitly, and also the notion of cyclic node had to be fixed.

(23) *The transformational cycle:*

Given a structure . . . [ $\alpha$  . . . [ $\beta$  . . .], where  $\alpha$  and  $\beta$  are cyclic nodes. Then all rules of grammar first have the chance to apply within  $\beta$ , and then within  $\alpha$ .

# Strict Cyclicity/ Extension Condition

*Note:*

- The definition of Merge, here repeated in (24), does not prevent the possibility that some element  $\alpha$  becomes merged to a position that is inside the current tree  $\Phi$ .
- This is because the definition says nothing about the properties of  $\beta$ . It may either be the case that  $\beta = \Phi$ , or it may be that  $\beta$  is contained in  $\Phi$ .

(24) *Merge:*

Merge takes two terms  $\alpha$  and  $\beta$  and combines them. The result is a new term  $\gamma = \{\alpha, \beta\}$ . ( $\text{Merge}(\alpha, \beta) \rightarrow \{\alpha, \beta\} (= \gamma)$ )

(25) *Term:*

$\alpha$  is a term iff a. or b. hold

- $\alpha$  is a lexical item.
- $\alpha$  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  $\alpha$  and  $\beta$  can only be merged if they are root nodes (in other words:  $\beta = \Phi$ , where  $\Phi$  is the current tree under construction).
- This property of Merge is called the Extension Condition (Chomsky 1993, 1995), see (26).
- (26) is closely related to what was called the Strict Cycle Condition in earlier stages of the theory (Chomsky 1973), see (27).

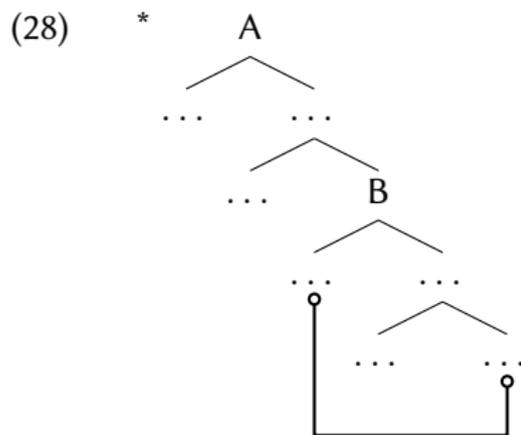
### (26) *Extension Condition (EC):*

Merge always applies at the root.

### (27) *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



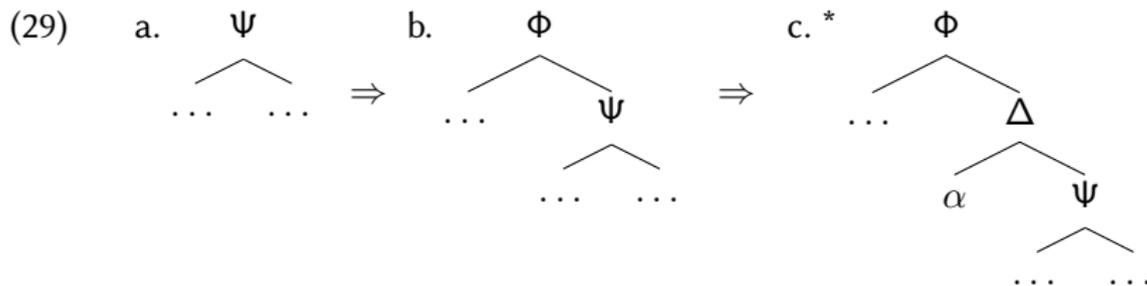
*Comment:*

The relation between the two positions within the domain B, indicated in (28) (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 in that it may cover 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.
- Both the EC and the SCC depend on the existence of the transformational cycle (no strict cyclicity without the cycle).
- The SCC also prohibits what the EC does, namely Merge at the non-root of a tree. The step from (29-b) to (29-c), which merges  $\alpha$  at some position *inside* the already constructed tree  $\Psi$ , violates both EC and SCC (i.e.,  $\beta = \Psi \neq \Phi$ ).



# Minimality and Strict Cyclicity

*An early argument (Chomsky 1973):*

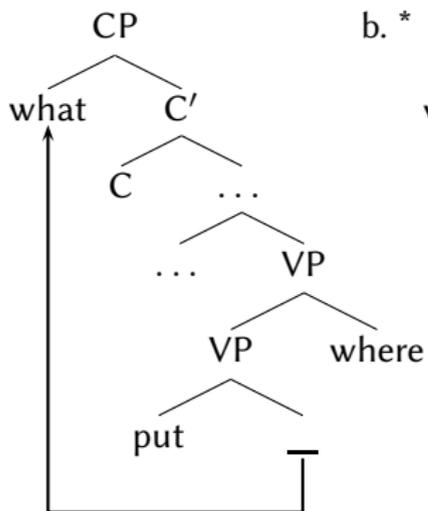
- In order to account for the ungrammaticality of (30), all derivations that could generate (30) must violate some principle of grammar.
- The derivation in (31) violates superiority/MLC twice (in (31-a) *where* is closer to the embedded C than *what*; in (31-b) *what* is closer to the matrix C than *where*), and is therefore properly ruled out.
- However, the derivation in (32) 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.

(30) \*Where<sub>i</sub> did he wonder [<sub>CP</sub> what<sub>j</sub> John put    <sub>j</sub>    <sub>i</sub> ]?

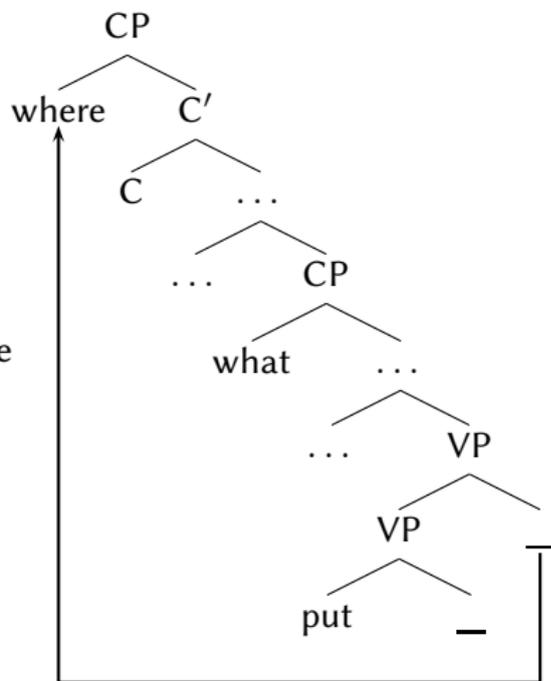
# Minimality and Strict Cyclicity

(31)

a. \*



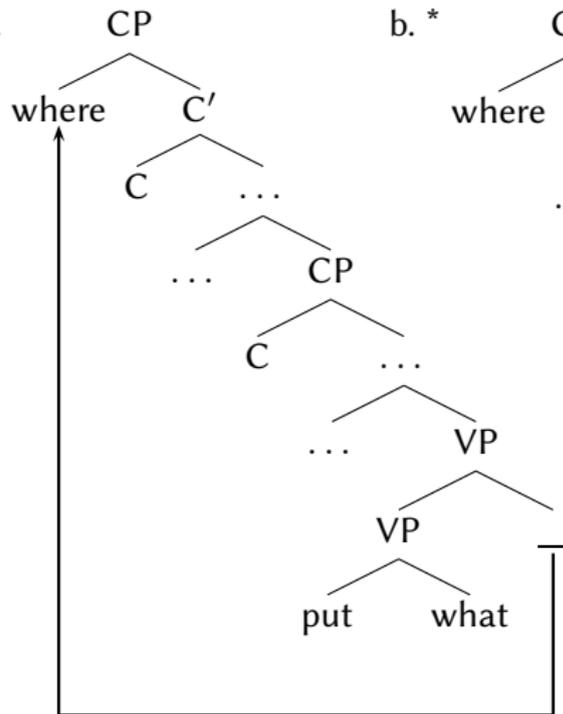
b. \*



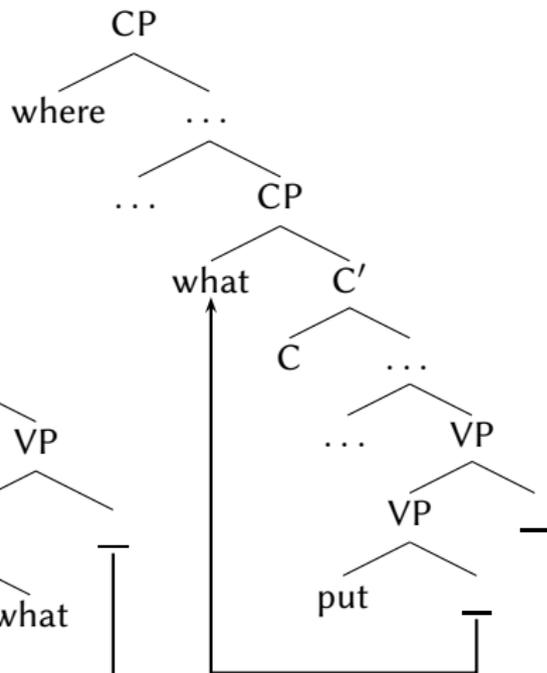
# Minimality and Strict Cyclicity

(32)

a.



b. \*



# Minimality and Strict Cyclicity

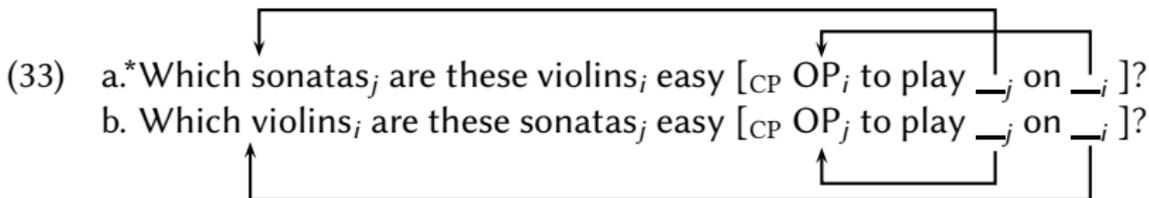
*Note:*

- This argument does no longer go through in all its details under more modern assumptions (which have to do with how movement out of CP proceeds)
- But it can be easily adapted to the modern theory in a way such that it still works. The revised argument that follows adapts an argument made in Kitahara (1994, 1997) to a modern view of syntactic theorizing. (Kitahara's argument is also a bit different from the presentation that follows.)

# Nested vs. crossing paths in English

*Pesetsky (1982):*

For many speakers examples like (33-b) are “almost completely acceptable” and contrast sharply with examples such as (33-a) (Chomsky 1986, Frampton 1990, Boyd 1992, Manzini 1992).

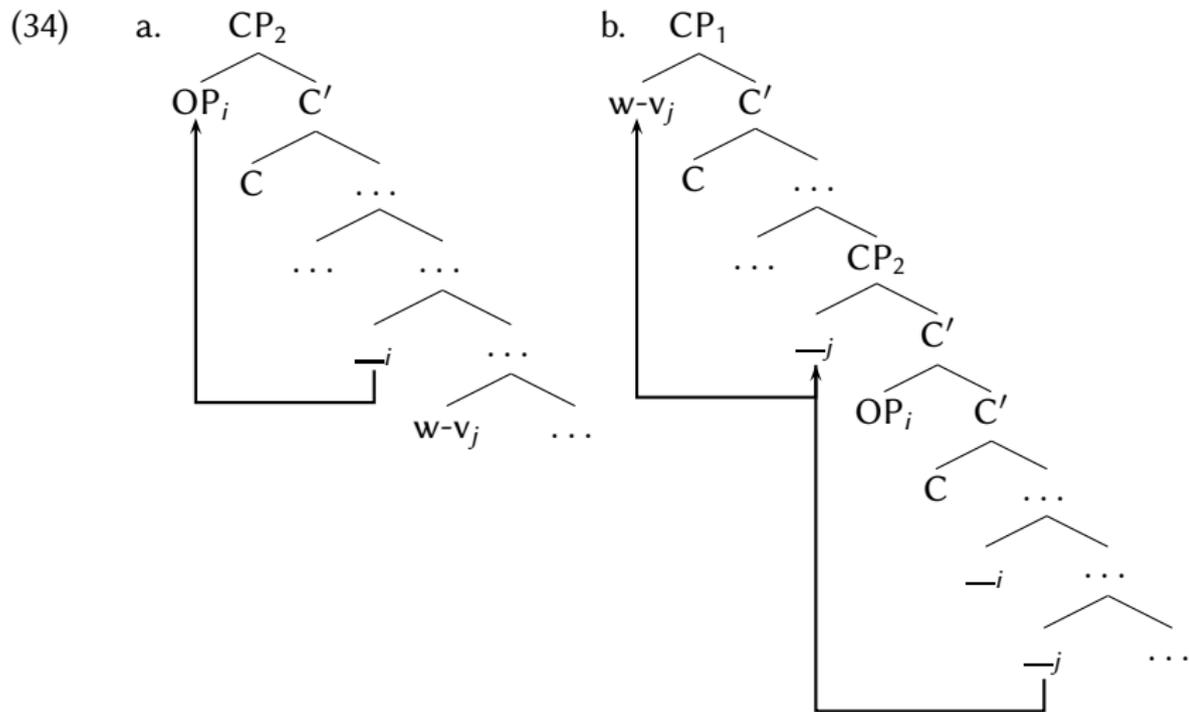


*Interpretation:*

- Background assumption: Movement out of a CP (as by *which violins* in (33-b)) must make an intermediate touch-down in SpecC (Reinhart 1981, Comorovski 1986, Rudin 1988, Richards 1997, Chomsky 2000, 2001; we will come back to this when we talk about phase theory).
- The grammaticality of (33-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 (34-b).

# Nested vs. crossing paths in English

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



# Excursus: Leapfrogging

## *Leapfrogging:*

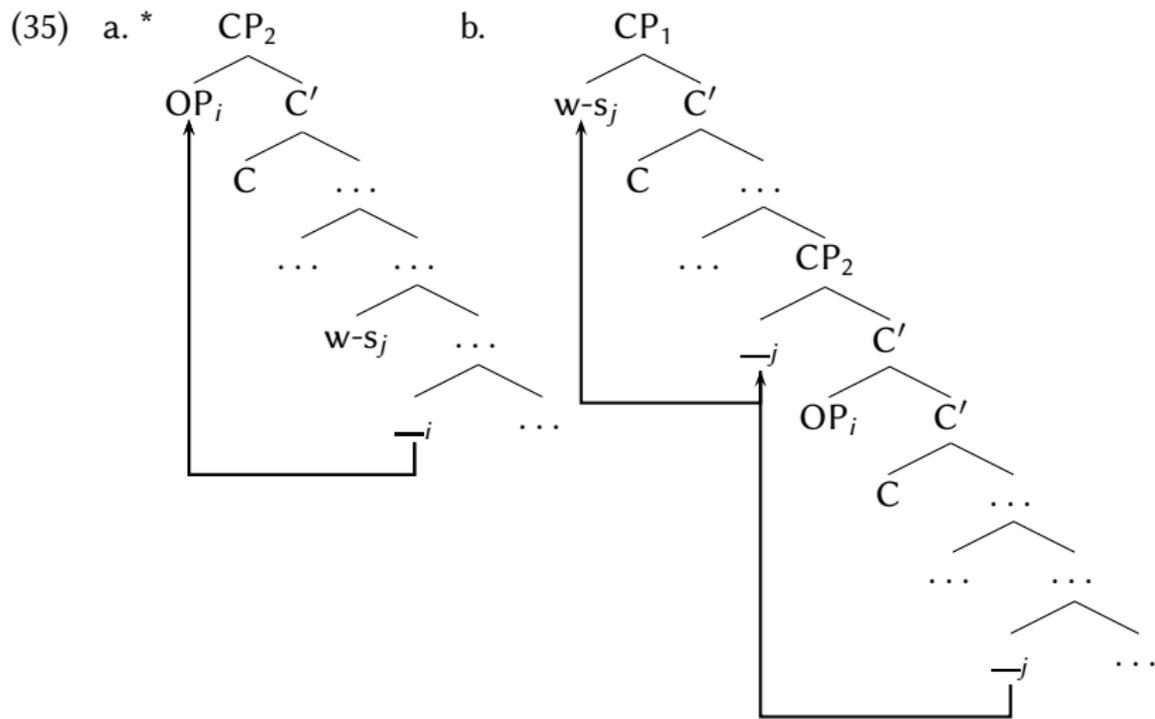
- In the first step in (34-b), *which violins* can skip over the empty operator without violating the MLC because OP is no longer c-commanded by C when *which violins* is probed. (Note: both the *wh*-phrase and OP are assumed to be probed by the C-head.)
- In this way, *which violins* then moves to an 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 (34-b)).
- Thus, such intermediate movement to a position right above a potentially intervening element (which is called “leapfrogging” or “hurdlng”, see 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.

# Nested vs. crossing paths in English

*The next step:*

- The ungrammaticality of (33-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), it follows from the MLC and, the crucial point here, its interaction with the SCC.

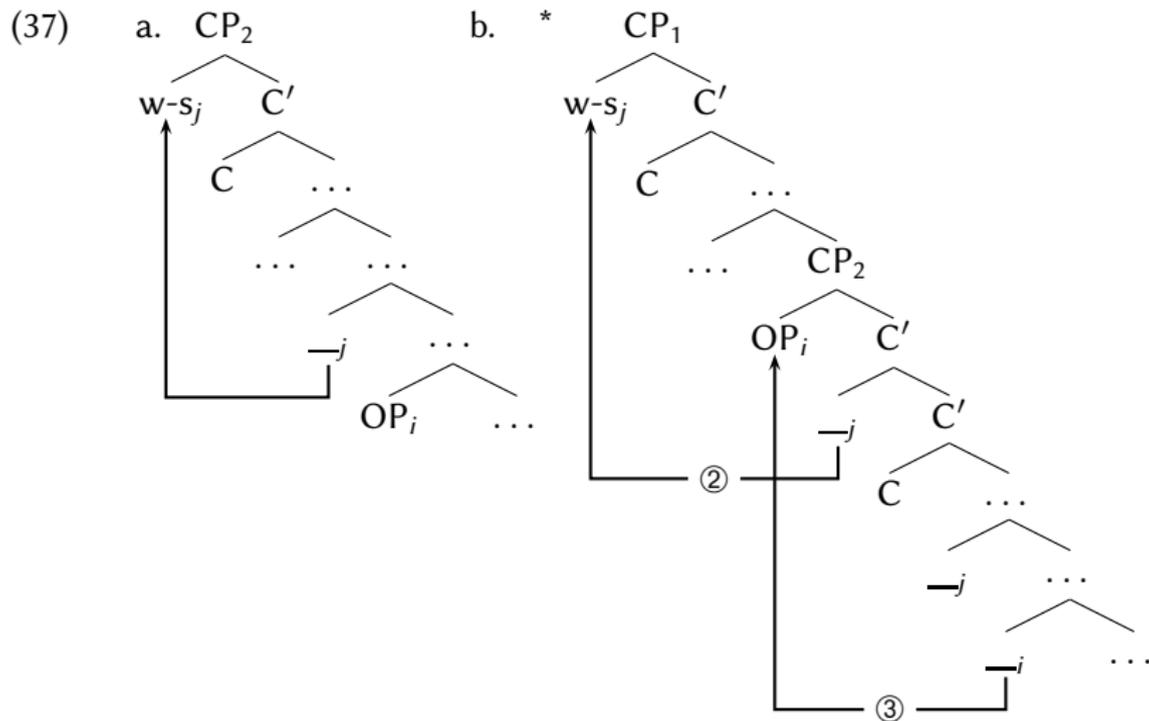
# Nested vs. crossing paths in English



*Note:* The first step (35-a) violates the MLC.



# Nested vs. crossing paths in English



*Note:* The third step (37-b) violates the SCC.



## Excursus: Tucking-In

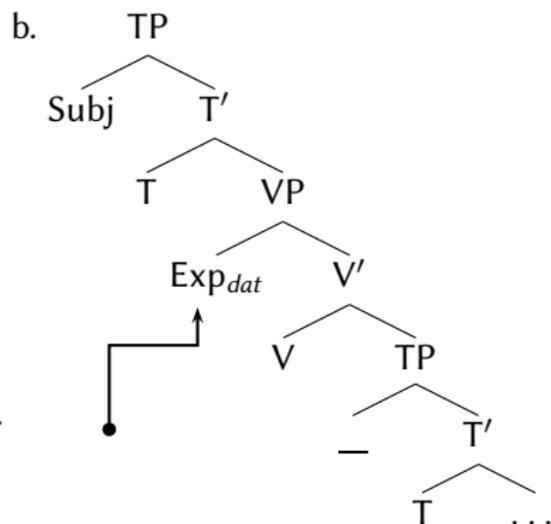
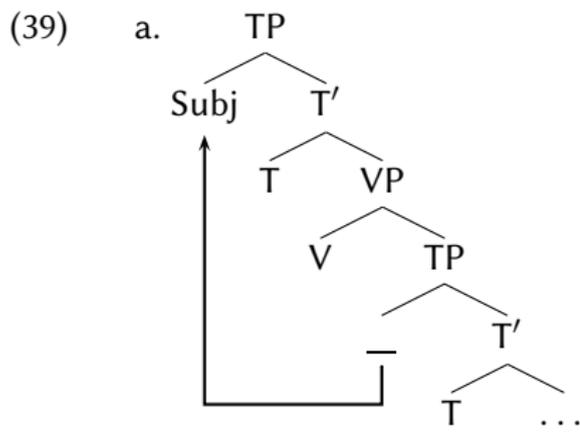
*Note:*

- The violation of the SCC in the second step in (38-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 specifier.
- Such a violation of the SCC is often assumed to be acceptable (and necessary) and 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 (38) undermines the Kitahara-style explanation of the ungrammaticality of (33-a) may serve as a potential argument against tucking-in (and in favor of a strict interpretation of the SCC).

# 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:



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