

# The H- $\alpha$ Schema and Phonological Ph(r)asing

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## 1 Introduction

### ★ Structure & goals of the talk:

- Argue for a specific characterization of phase cycles, incorporating insights from both Chomsky's (2000 et seq.) phase theory and Uriagereka's (1999) Multiple Spell-Out model
  - \* Specifically, we will propose that the ban on feature-percolation of edge-features (EFs) will necessitate cyclic application of Transfer.
- Discuss evidence for this view from syntactic locality effects and phonological phrasing
- Suggest a line of research that moves towards eliminating feature-percolation in UG

## 2 Cyclic Transfer in service of recursive Merge

### 2.1 Edge-feature and the H- $\alpha$ schema

#### ★ Chomsky (2008) hypothesizes:

"For an LI [lexical item] to be able to enter into a computation, merging with some SO [syntactic object], it must have some property permitting this operation. A property of an LI is called a *feature*, so an LI has a feature that permits it to be merged. Call this the *edge-feature* (EF) of the LI. . . . When merged with a syntactic object SO, LI forms {LI, SO}; SO is its complement. The fact that Merge iterates without limit is a property at least of LIs—and *optimally, only of LIs, as I will assume.*" (Chomsky 2008:139, emphasis mine)

Here Chomsky proposes:

- (1) a. *The edge-feature (EF) is the feature that permits its bearer to be merged to some SO.*  
b. *The EF is a property only of LIs.*

#### ★ (2) is a logical consequence of (1), inevitable unless some further UG-enriching stipulation is provided:

(2) *No phrases (non-LIs) have EFs.*

In other words, feature-percolation of an EF to a phrasal node is not a possibility. (2) is the null hypothesis, given that the current minimalist literature pursues the possibility of eliminating *feature-percolation* (and *labeling*, just a local instantiation of feature-percolation) from the theory of UG (see Cable (2007a,b, 2008), Heck (2008, 2009) for arguments in favor of eliminating feature-percolation, and Collins (2002), Seely (2006), Chomsky (2004, 2007, 2008), Boeckx (to appear), Narita (2009b) for arguments in favor of eliminating labeling).

#### ★ We are thus forced to conclude (3):

(3) *Only an LI (H) is permitted to be merged to some other SO ( $\alpha$ ).*

Merge(H,  $\alpha$ )  $\rightarrow$  {H,  $\alpha$ }

That is, all instances of Merge must take an LI as at least one of its inputs.

(4) The H- $\alpha$  schema (Narita 2009a,c; cf. Uriagereka 1999, 2009, Fukui forthcoming):  
Merge(H,  $\alpha$ )  $\rightarrow$  {H,  $\alpha$ }.

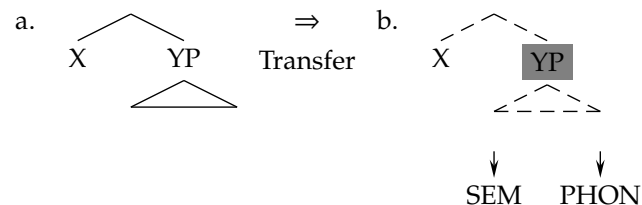
### 2.2 No "XP-XP" merger

#### ★ The H- $\alpha$ schema immediately predicts:

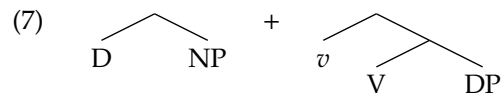
(5) *No two phrases (non-LIs) can be merged.*

#### ★ We argue that (5) is a sustainable conclusion if syntax utilizes cyclic derivations by phase (see also Uriagereka 1999, Chomsky 2000, 2001, 2008). See in particular Uriagereka (1999) for an earlier rationale in terms of Kayne's (1994) Linear Correspondence Axiom (LCA).

(6) *By Transfer, the phase head X strips off the interior domain YP to SEM and PHON and counts as a bare LI again.*

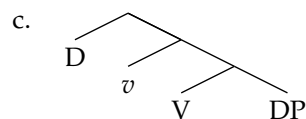
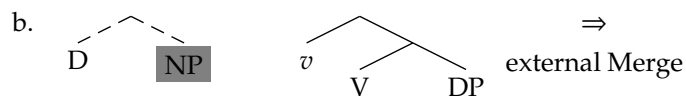
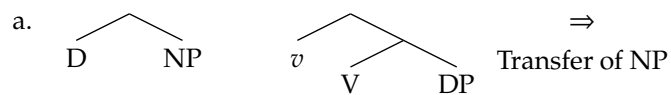


- ★ Consider, e.g., the merger of an external argument DP to the edge of  $v'$ , a typical instance of apparent “XP-XP” external merger.



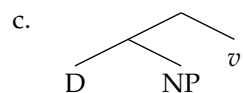
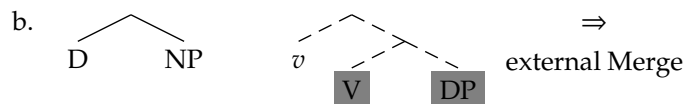
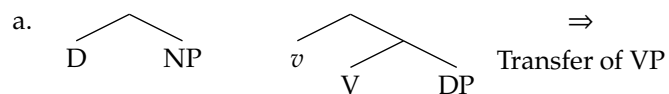
- ★ Applying Transfer to the subject DP-phase will reduce it to a simplex LI D, which can be then merged to the edge of  $v$  in conformity with the H- $\alpha$  schema (cf. Uriagereka 1999). Call such a derivational option the *noncomplement-reduction*.

(8) noncomplement-reduction



- ★ Note that unlike Uriagereka’s multiple Spell-Out model, our H- $\alpha$  schema allows the other option, too, which is to keep the subject DP intact and instead transfer the complement of  $v$ . Call this *comp-reduction*.

(9) Comp-reduction



- ★ In short, a phrase XP can be merged to another phrase YP only when XP can constitute a phase, whose head LI can count as a ‘revived’ simplex LI after it Transfers its phase-interior domain.

- ★ The hypothesis that EFs are properties only of LIs derives the fact that recursive Merge in human language makes crucial use of cyclic Transfer.

### 2.3 Deriving CED without recourse to the LCA

- ★ Let’s assume with Uriagereka (1999), Nunes and Uriagereka (2000) and Chomsky (2000, 2004, 2008) that Transfer of XP renders elements within XP inaccessible to further syntactic operations (the Phase-impenetrability Condition).

- ★ Under Uriagereka’s LCA-based multiple Spell-Out model, noncomplement-reduction is always the only option to achieve “XP-XP” merger, thus any noncomplement XP (Specs and adjuncts) should always exhibit island effects (CED effects: Huang 1982; see also Nunes and Uriagereka 2000).

- ★ However, Stepanov (2007) reports a number of examples from various languages that exhibit subextraction from subjects: I here provide some relevant examples from Japanese that shows subextraction from the (sentential) external argument. See in particular Saito and Fukui (1998), Ishii (1997) for Japanese.

(10) Japanese:

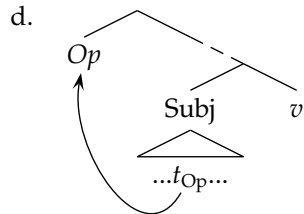
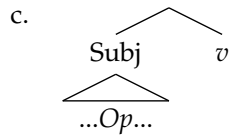
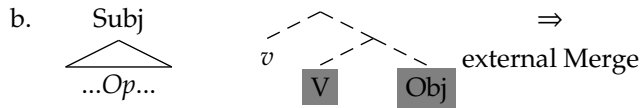
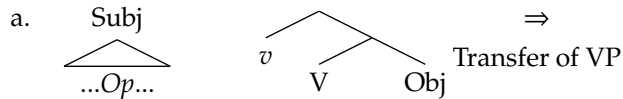
- a. Cleft  
 [ $Op_j$  [John-ga  $t_j$  okane-o karita koto]-ga Bill-o  
 John-NOM money-ACC borrowed NML -NOM Bill-ACC  
 kizutuketa no]-wa *Mary-kara $_j$*  datta.  
 hurt NML -TOP *Mary-from* CPL.PAST  
 “It was *from Mary $_j$*  [ $Op_j$  that [that John borrowed money  $t_j$  hurt Bill].”
- b. *Tough*-movement  
*Mary-kara-ga $_i$*  [(John $_i$ -nitotte) [ $Op_i$  [[[zibun-ga $_i$   $t_i$  okane-o  
*Mary-from-NOM* John-as.for self-NOM money-ACC  
 takusan kariteiru koto]-ga Bill-o kanasim-ase-teiru to]  
 a.lot borrow NML -NOM Bill-ACC feel.Sad-CAUS-PRES-PROG that  
 mitome] nikui]].  
 admit hard  
 Lit. “[from *Mary $_i$*  is hard (for *John $_j$* ) to admit [that [(the fact) that he $_j$  has borrowed a lot of money  $e_i$ ] makes Bill sad].”
- c. Scrambling

sono hon- $o_i$  John-ga [[Mary-ga  $t_i$  katta koto]-ga Bill-o  
 that book-ACC John-NOM Mary-NOM bought NML -NOM Bill-ACC  
 kizutuketa to] omotteru.  
 hurt that think  
 "That book $_i$ , John thinks [that [that Mary bought  $t_i$ ] hurt Bill]."

★ On the other hand, if we instead emancipate the H- $\alpha$  schema from the LCA, complement-reduction becomes an option, and its application can ensure the relevant "XP-XP" merger without necessarily Transferring noncomplements.

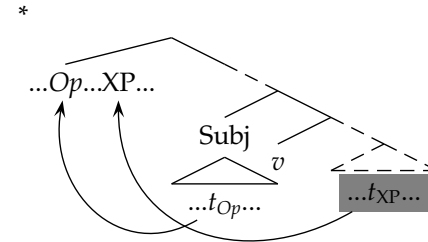
(11) **The H- $\alpha$  schema:**  
 $Merge(H, \alpha) \rightarrow \{H, \alpha\}$ .

(12) Complement-reduction and subsequent subextraction from the in-situ subject.



★ The other prediction by the H- $\alpha$  schema is that complement-reduction (a) renders the relevant complement an island.

(13) New prediction:



This prediction is indeed borne out by the following examples.

(14) Japanese: Cleft and scrambling

- a. [Op<sub>j</sub> John-ga  $t_j$  okane-o karita koto]-ga Bill-o  
 John-NOM money-ACC borrowed NML -NOM Bill-ACC  
 kizutuketa no]-wa Mary-kara<sub>j</sub> datta. (=10-a)  
 hurt NML -TOP Mary-from CPL.PAST  
 "It was from Mary<sub>j</sub> [Op<sub>j</sub> that [that John borrowed money  $t_j$ ] hurt Bill]."
- b. \*? [Op<sub>j</sub> Bill-o<sub>i</sub> [John-ga  $t_j$  okane-o karita koto]-ga  $t_i$   
 Bill-ACC John-NOM money-ACC borrowed NML -NOM  
 kizutuketa no]-wa Mary-kara<sub>j</sub> datta.  
 hurt NML -TOP Mary-from CPL.PAST  
 "It was from Mary<sub>j</sub> [Op<sub>j</sub> that Bill<sub>i</sub>, [that John borrowed money  $t_j$ ] hurt  $t_i$ ]."
- cf. [Op<sub>i</sub> Bill-ga [John-ga  $t_j$  okane-o karita koto]-o  
 Bill-NOM John-NOM money-ACC borrowed NML -ACC  
 kanasindeiru no]-wa Mary-kara<sub>j</sub> datta.  
 lament NML -TOP Mary-from CPL.PAST  
 "It was from Mary<sub>j</sub> [Op<sub>i</sub> that Bill lamented [that John borrowed money  $t_j$ ]."

(15) Japanese: Tough-movement and scrambling

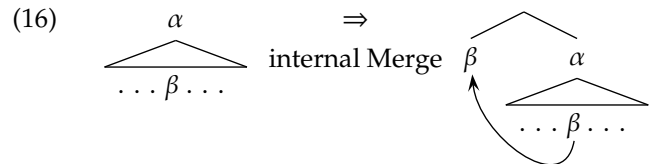
- a. [Mary-kara]<sub>i</sub>-ga [(John<sub>i</sub>-nitotte) [Op<sub>i</sub> [[[zibun-ga<sub>i</sub>  $t_i$   
 Mary-from -NOM John-as.for self-NOM  
 okane-o takusan kariteiru koto]-ga Bill-o  
 money-ACC a.lot borrow NML -NOM Bill-ACC  
 kanasim-ase-teiru to] mitome] nikui]]. (=10-b)  
 feel.sad-CAUS-PRES-PROG that admit hard  
 Lit. "[from Mary]<sub>i</sub> is hard (for John<sub>j</sub>) to admit [that [(the fact) that he<sub>j</sub> has borrowed a lot of money  $e_i$ ] makes Bill sad]."
- b. \*? Mary-kara-ga<sub>i</sub> [(John<sub>i</sub>-nitotte) [Op<sub>i</sub> [[Bill-o<sub>k</sub> [zibun-ga<sub>i</sub>  $t_i$   
 Mary-from-NOM John-as.for Bill-ACC self-NOM

okane-o takusan kariteiru koto]-ga  $t_k$  kanasim-ase-teiru  
 money-ACC a.lot borrow NML -NOM feel.sad-CAUS-PRES-PROG  
 to] mitome] nikui]].  
 that admit hard  
 Lit. “[from Mary]<sub>i</sub> is hard (for John)<sub>j</sub> to admit [that Bill]<sub>k</sub>, [(the  
 fact) that he]<sub>j</sub> has borrowed a lot of money  $e_i$ ] makes  $t_k$  sad].”

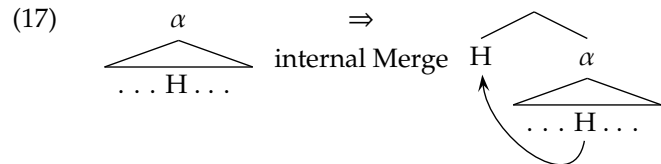
- ★ Moreover, adjunct condition effects can also be naturally attributed to noncomplement-reduction, a topic to be discussed in §4.

## 2.4 Movement and phase cycles

- ★ The H- $\alpha$  schema predicts that *only LIs can undergo internal Merge*.



Since  $\alpha$  here must be a phrase/non-LI by definition (since it contains other SOs, including  $\beta$ ), the H- $\alpha$  schema predicts that  $\beta$  is always an LI.



- ★ The prediction by the H- $\alpha$  schema, then, is that all the moved ph(r)ases exhibit the *freezing effect* (Culicover and Wexler 1980 and many others).

(18) *The Freezing Corollary:*  
 A moved ph(r)ase constitutes an island for extraction.

This is because all the moved ph(r)ases must have become ‘bare LIs’ (without any edge) by means of cyclic Transfer to move.

- (19) (Lasnik and Park 2003)
- Which candidate were there [posters of t] all over the town?
  - \*Which candidate were [posters of t] all over the town?

- (20)
- Who did you see [pictures of t]?
  - \*Who did you believe [pictures of t] to be sold out?

(21) Spanish: transparent postverbal subject (Uriagereka 1988:116; see also Gallego 2007)

- \*[de qué conferenciantes]<sub>1</sub> te parece [que [las of what speakers CL-to-you seem.3SG that the propuestas  $t_1$ ] me van a impresionar].  
 proposals CL-to-me go-3PL to impress  
 “Of which speakers does it seem to you that [the proposals t] will impress me.”
- (?)[de qué conferenciantes]<sub>1</sub> te parece [que me of what speakers CL-to-you seem.3SG that CL-to-me van a impresionar [las propuestas  $t_1$ ]].  
 go-3PL to impress the proposals  
 “Of which speakers does it seem to you that will impress me [the proposals t].”

## 3 Phonological phrases as syntactic phases

- ★ We argue that this conception of cyclic Transfer can account for a number of data on phonological phrasing in various syntactic environments if a spell-out domain defines a phonological phrase ( $\phi$ ; see Samuels (2009) for extensive cross-linguistic evidence).

- ★ Richards (2004) points out two consequences of such an architecture:

(22) *The Phase Integrity Condition*  
 For two adjacent categories to be parsed inside the same  $\phi$  (and any lower prosodic category), they must be spelt out in the same phase.

(23) *The Maximal  $\phi$  Condition*  
 A prosodic phrase  $\phi$  ( $\dots \omega$ , etc.) can be no larger than a phase.

- ★ The H- $\alpha$  schema makes specific predictions which go beyond the standard phase-based approach and better accord with the phonological facts: previous phase-based phonological works such as Newell (2008) and Samuels (2009) already noted the need to make additional assumptions regarding complex specifiers and adjuncts, precisely as indicated by the H- $\alpha$  schema.

- ★ According to the H- $\alpha$  schema, a phrasal subject and the VP-constituent comprising V and the object DP have to belong to separate Transfer domains as we have seen above (see (8) and (9)): since the subject undergoes Internal Merge, it must be restored to LI status.

- ★ We therefore predict that a phrasal subject and verb are phonologically phrased separately in transitive clauses, regardless of the verb’s location.

- ★ We also make the reverse prediction that if the subject is a simplex LI (say a pronoun) it does not have to constitute its own phonological phrase. The significance of branchingness for phonological phrasing has long been recognized, e.g.:

(24)  $\phi$  Restructuring (optional) (Nespor and Vogel 1986: 173)  
A nonbranching  $\phi$  which is the first complement of X on its recursive side is joined into the  $\phi$  that contains X.

- ★ Our prediction is borne out by the typological data. The following types of phrasing patterns are available for transitive sentences in languages which typically exhibit SVO order (building on, though departing significantly from, Dobashi (2003); see Samuels (2009:, §5.4) for relevant discussion though the present work supercedes it in part):

(25) Typology of  $\phi$ -domains

- (S) $_{\phi}$  (V) $_{\phi}$  (O) $_{\phi}$   
(S) $_{\phi}$  (O V) $_{\phi}$  if O is non branching (Aᅁᅁ Ewe)
- (S) $_{\phi}$  (V) $_{\phi}$  (O) $_{\phi}$   
(S) $_{\phi}$  (V O) $_{\phi}$ /(O V) $_{\phi}$  if O is non-branching (Italian)
- (S) $_{\phi}$  (V) $_{\phi}$  (O) $_{\phi}$   
(S V) $_{\phi}$  (O) $_{\phi}$  if S is non-branching  
(S) $_{\phi}$  (V O) $_{\phi}$ /(O V) $_{\phi}$  if O is non branching  
(S O V) $_{\phi}$  if S and O are non-branching (French)

(26) a. [mē] [fo] [Kofi] (Aᅁᅁ Ewe)  
I hit Kofi  
'I'm hitting Kofi'

b. [mē] [kpé flé-gé]  
I stone buy-PRT  
'I'm going to buy a stone'

(27) a. [Venderá] [questo leopardo] [in dicembre] (Italian)  
sell.FUT.3SG this leopard in December  
'He will sell this leopard in December'

b. [prenderá tordi]  
catch.FUT.3SG thrushes  
'He will catch thrushes'

(28) a. [L' immigré] [envoyait] [un paquet] [à sa famille] (French)  
the immigrant sent a package to his family  
'The immigrant sent a package to his family'

b. [Donnez en] [à Marcel]  
give it to Marcel  
'Give it to Marcel'

c. [Nous allons]  
we go.1PL  
'We go'

d. [Marie le voit]  
Marie him sees  
'Marie sees him'

- ★ In Aᅁᅁ Ewe, the subject is in fact a Topic (see Demuth and Mmusi (1997) on Bantu more generally). This will ensure it is spelled out alone even if it is non-branching, assuming there is at least one phase head in the left periphery, and the subject A'-moves into its specifier (or higher).

► The presence of (a) phase head(s) in the left periphery also accounts for the cross-linguistic fact that topics/focused elements are phrased separately (see, e.g., Selkirk (2005)).

- ★ In each language considered here, there is independent support for V-to-T movement. This means any *in situ* object will be spelled out by *v* separately from the verb. A simplex object which raises out of VP may be phrased with the verb, while the H- $\alpha$  schema forces a branching object to reduce to bare LI status if it is to undergo movement.

- ★ In (25) we see this asymmetry in object phrasing. Dobashi (2003), assuming phase-based  $\phi$  construction, accounts for it by saying that object raising is optional and can only be undergone by simplex objects. Note again that if we assume the H- $\alpha$  schema, movement of a branching object will still result in its being phrased separately.

- ★ Comparing Italian and Ewe, we note that they are alike in having the subject in Topic (on the connection with *pro*-drop, see Alexiadou and Anagnostopoulou 1998, Dobashi 2003, Frascarelli 2007) and verb in T. Simplex objects (at least) may raise in both languages, but in Italian, only object clitics move to a preverbal position.

- ★ The difference between French and Italian is the height of the subject: in French, the subject has only moved as far as Spec,TP, so a non-branching subject can be phrased with a verb in T.

- ★ In sum:  $\phi$ -domains depend on the interaction of three things (holding constant the position of the verb in T/*v*): whether the subject is in an A' position, whether the object has raised out of VP, and whether the arguments branch.

#### 4 Adjunct ph(r)asing

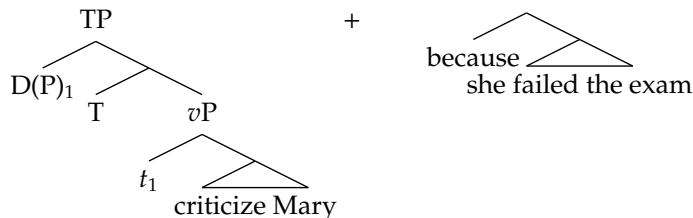
- ★ If we adopt the null hypothesis that the H- $\alpha$  schema also applies to external merger of adjuncts, our theory predicts that phrasal adjuncts, but not sim-

plex LI adjuncts, obligatorily constitute separate intonational phrases, as has been reported in the phonological literature (see, e.g., Zec and Inkelas (1990) and Bošković (1995) on Serbo-Croatian, Sato (2006) on French).

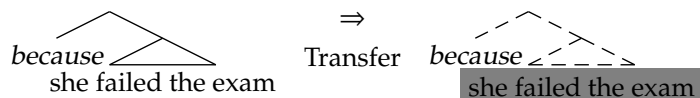
- ★ Uriagereka (1999) claims that adjuncts are always islands because they are always subject to noncomplement-reduction.

(29) E.g., adjunction of an adverbial *because*-clause

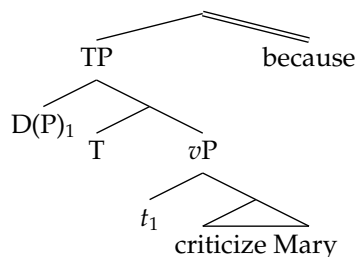
The man criticized Mary because she failed the exam.



a. Noncomplement-reduction of the *because*-clause:



b. Adjunction of *because* to TP:



- ★ We agree with Uriagereka's (1999) claim that this kind of noncomplement-reduction is presumably responsible for the CED effect for adjuncts (see Cattell 1976, Huang 1982, Chomsky 1986, Uriagereka 1999).

(30) 'high', TP-level adjuncts (such as reason-clauses, finite temporal adverbials) typically show CED effects.

- \*This is the girl<sub>i</sub> that John failed the test [because he was thinking about t<sub>i</sub>].
- \*I know what<sub>i</sub> the man criticized Mary [after she said t<sub>i</sub>].
- \*It was this flaw<sub>i</sub> that the man criticized Mary [due to t<sub>i</sub>].

- ★ However, not all adjuncts constitute islands (see already Chomsky 1982:72). For example, Truswell (2007a,b, forthcoming) provides a thorough survey of apparent CED-violating subextraction from adjuncts.

- (31)
- This is the book<sub>i</sub> that John designed the garden [after reading t<sub>i</sub>].
  - It was *Hey Jude*<sub>i</sub> that John arrived [whistling t<sub>i</sub>].
  - I bet I know what<sub>i</sub> John drove Mary crazy [trying to fix t<sub>i</sub>].
  - It is this goal<sub>i</sub> that students are working so hard [in order to achieve t<sub>i</sub>].
  - Mary told me that Sam is who<sub>i</sub> John traveled to England [to make a sculpture of t<sub>i</sub>].
  - There's the taxi<sub>i</sub> that John was jumping up and down [in order to attract t<sub>i</sub>].
  - This is the matter<sub>i</sub> that I came in [to talk to you about t<sub>i</sub>] today.

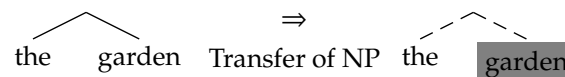
- ★ Subextraction from noncomplements entails complement-reduction at the relevant point of derivation. Complement-reduction is, again, available only in our (LCA-free) H-α schema.

- ★ We propose that these transparent tenseless adjuncts are allowed to adjoin low in the clausal spine, within the *v*-phase. This difference would allow us to draw the cut between the TP-level adjuncts (exhibiting CED effects) and the low, VP-level adjuncts in question (exempt from CED effects).

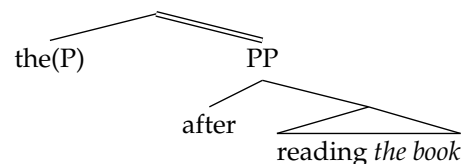
- ★ Consider, e.g., the derivation of (32)/(31-a).

(32) This is the book<sub>i</sub> that John designed the garden [after reading t<sub>i</sub>].

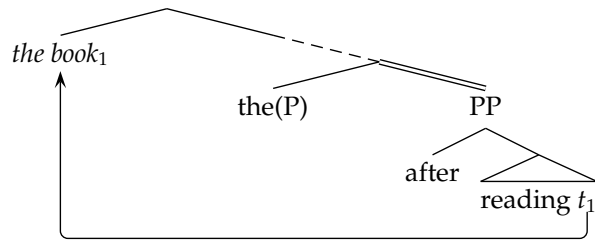
a. Complement-reduction



b. external (pair)-Merge/adjunction of the adjunct PP



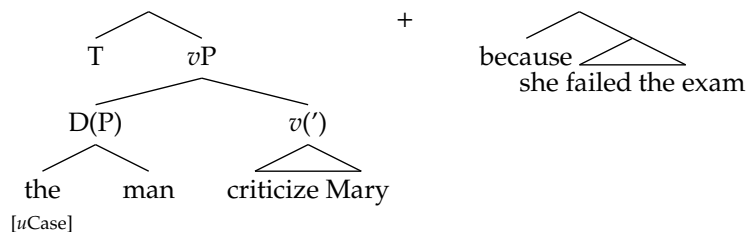
c. subsequent subextraction from the adjunct PP



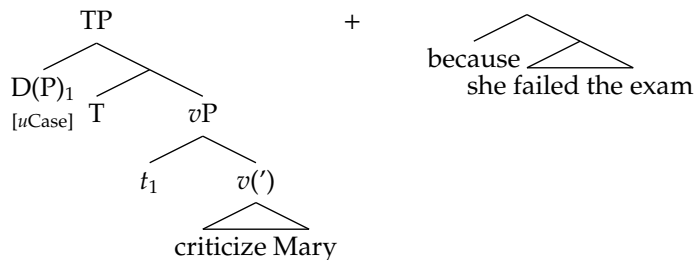
★ As desired, the availability of such a derivation is restricted to these ‘low’, VP-level adjuncts. ‘High’ TP-level adjuncts are predicted to be obligatorily subject to noncomplement-reduction for Case reasons.

- In order for a TP-level adjunct (say a *because*-clause) to adjoin to T' or TP without noncomplement-reduction, it is necessary that the complement-domain (crucially containing the subject DP) undergoes Transfer prior to the adjunction/pair-Merge.
- However, Nominative Case checking on the subject DP is contingent on the presence of C (Watanabe 1996, Chomsky 2001, 2008), thus the subject DP cannot undergo Transfer prior to the merger of C.

(33)



(34)



★ Our phase-based theory of phonological phrasing predicts that in such cases the relevant adjunct clause must not constitute a separate phase/phonological phrase.

★ This correlates with the fact that a  $\phi$  boundary cannot occur in this location.

- (35)
- a. John drove Mary crazy [whistling hornpipes].
  - b. This is the hornpipe that John drove Mary crazy [whistling t].
  - c. \*This is the hornpipe that John drove Mary crazy # whistling.
  - d. I know what John arrived [whistling t].
  - e. \*I know what John arrived # whistling.

★ Truswell (2007a,b, forthcoming) proposes a semantic account for the (un)availability of subextraction from adjuncts. He argues that subextraction from adjuncts is allowed as long as it satisfies the semantic condition stated in (36).

- (36) *The Single Event Condition* (Truswell 2007a,b, forthcoming):  
An instance of wh-movement is acceptable only if the minimal constituent containing the head and the foot of the chain describes a single event.

We suggest reinterpreting the relationship between the Single Event Condition and subextraction: rather than seeing the semantic condition as an axiom that *a posteriori* allows subextraction from adjuncts, we should rather see phase-based cyclicity as the source of semantic/phonological coherency of the Transferred domains.

★ Thus, the Single Event Condition and Maximal  $\phi$  Condition are two sides of the same coin, both corollaries of phases.

## 5 Concluding remarks: eliminating feature percolation

★ We argued that the H- $\alpha$  schema (11), deduced from the definition of EFs and the lack of feature-percolation thereof (37), provides a way of reconciling the insights of Uriagereka’s Multiple Spell-Out with Chomsky’s phase system and gives us the right cut for phonological phrasing, achieving a more transparent conception of the syntax-phonology interface.

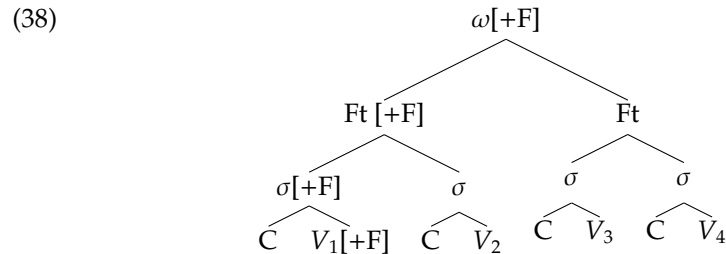
- (11) The LCA-free H- $\alpha$  schema  
 $Merge(H, \alpha) \rightarrow \{H, \alpha\}$ .

- (37) The EF does not undergo feature-percolation. (No phrases/non-LIs have EFs.)

$$X_e + Y_e \rightarrow \{X_e, Y_e\}$$

$$\text{Merge } (*\{X_e, Y_e\}_e)$$

- ★ The dull interpretation of (37) would be that the EF simply belongs to the class of features that does not undergo feature-percolation (while other features do).
- ★ The more interesting interpretation of (37) is that it is to be subsumed under a much more general conclusion, already envisaged by many researchers, including Collins (2002), Seely (2006), Chomsky (2004, 2007, 2008), Cable (2007a,b, 2008), Heck (2008, 2009), Boeckx (to appear), and Narita (2009a,b,c): there is no feature percolation in syntax.
- ★ Halle and Vergnaud (1981) propose a percolation model of vowel harmony: [+F] percolates from a donor vowel to the PrWd ( $\omega$ ) node, then down through the feet (Ft) and syllables ( $\sigma$ ) to the other vocalic nodes.



- ★ [+F] must percolate up, and back down, through the  $\sigma$ , Ft, and  $\omega$  nodes, but it is not interpreted in any of those places (Neeleman and van de Koot 2006). Furthermore, downward percolation of features violates Inclusiveness, which requires recoverability of the properties expressed on nodes in the hierarchy (Chomsky 1995).
- ★ This cannot account for cases in which  $V_2$  initially carries [+F], and this feature ends up being expressed only on  $V_2$  and vowels to its right. Because [+F] must percolate all the way up to the word level and then back down from there, it cannot be discriminating in where [+F] is expressed; it will simply result in every vowel receiving that featural specification.
- ★ The shortcomings of this approach were already noted as Autosegmental Phonology gained ground. More recently, Mailhot and Reiss (2007) propose SEARCH and COPY algorithms (perhaps to be seen as akin to Agree) which operate over flat linear representations: harmonic vowels are initially underspecified for [F], so they SEARCH left for the closest value of [F], then COPY that value onto themselves. Samuels (2009) extends this approach beyond harmony.
- ★ If we are on the right track, then, perhaps we can strengthen our conclusion:

(39) UG does not include any feature-percolation mechanism at all.

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