

***{XP, YP}, the Independence of the LCA and Antisymmetry, and the LCA-free Phase-based Account of the CED Effect**

Running Head: *{XP, YP} and the LCA-free Phase-based Account of the CED Effect

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Abstract: Although Chomsky's (2000 *et seq.*) theory of cyclic Transfer has become the standard currency in the literature, it was Uriagereka (1999) who for the first time resurrected the notion of derivational cycle in the framework of bare phrase structure (Chomsky 1994, 1995). As will become obvious, Uriagereka's (1999) original conception of phase cycle is based on some empirically ill-advised premises, most notably the *Linear Correspondence Axiom* (LCA) of Kayne (1994), but at the same time his theory still expresses some important insights into the design specification of phase cycles. On the one hand, this article will scrutinize Uriagereka's account of the CED, and point out that the empirical results that he envisaged can be best achieved only when we dissociate the theory from the LCA. On the other hand, it will highly appreciate Uriagereka's serious criticism on the original LCA, and conclude that the LCA in fact has no place in bare phrase structure/projection-free syntax. This article will also briefly review Kayne's (2010) alternative, LCA-free theory of antisymmetry, noting that it is plainly orthogonal to the phase-based account of the CED effect.

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1 Introduction

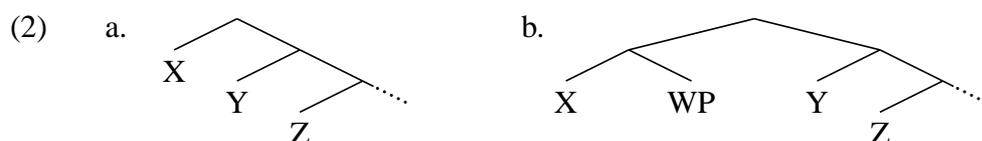
Since Chomsky (2000), a variety of phase-based approaches of syntactic locality have been investigated, and some of the illuminating ideas are presented and explored in the papers collected in this volume. Chomsky's theory of cyclic Transfer and the Phase-Impenetrability Condition (PIC) has become the standard currency in the literature of locality constraints, but it was Uriagereka's (1999) theory of the CED that for the first time resurrected the notion of derivational cycle in the framework of bare phrase structure (Chomsky 1994, 1995). As will become obvious, Uriagereka's (1999) original conception of phase cycle is based on some empirically ill-advised premises, most notably the *Linear Correspondence Axiom* (LCA) of Kayne (1994), but at the same time his theory still expresses some important insights into the design specification of phase cycles. On the one hand, this article will scrutinize Uriagereka's account of the CED, and point out that the empirical results that he envisaged can be best achieved only when we dissociate the theory from the LCA. On the other hand, it will highly appreciate Uriagereka's serious criticism on the original LCA, and conclude that the LCA in fact has no place in bare phrase structure/projection-free syntax. This article will also briefly review Kayne's (2010) alternative, LCA-free theory of antisymmetry, noting that it is plainly orthogonal to the phase-based account of the CED effect.

2 *{XP, YP} and the LCA-based v.s. LCA-free H- α Schemata

To review, the essence of Uriagereka (1999) was the claim that the requisite process of linearization via a version of the LCA requires total asymmetric c-command relations among lexical items (LIs) to be properly established in syntactic derivation, and that this requirement in turn yields cyclic derivation by phase. Uriagereka's exposition of the LCA are summarized in (1).

- (1) *The Linear Correspondence Axiom* (LCA) (Kayne 1994; rephrased by Uriagereka 1999)
 - a. Base Step: If α asymmetrically c-commands β , then α precedes β .
 - b. Induction Step: If γ asymmetrically c-commands β and γ dominates α , then α precedes β .

The base step (1a) maps the asymmetric c-command relation between two LIs, say X and Y, to precedence (henceforth denoted as $X \rightarrow Y$ and read as 'X precedes Y'). For example, (1a) maps the input representation in (2a) to a sequence of LIs, $X \rightarrow Y \rightarrow Z \rightarrow \dots$, since X asymmetrically c-commands Y, Y asymmetrically c-commands Z ..., etc. In structures like (2a) where each instance of merger takes one LI and one non-LI (phrase) as its input (what Uriagereka calls *Command-Units*), then the same LI can asymmetrically c-command the rest of the LIs within the phrase. Solely the base step of the LCA (1a) suffices to determine the total linear ordering of the LIs. On the other hand, for the LCA to linearize structures like (2b), where two phrases are merged, recourse to the induction step (1b) is necessary, given that there is no direct asymmetric c-command relation established between the LIs of one phrase and those of the other. Thus, for example, X and Y in (2b) can be assigned a precedence relation by (1b), thanks to the fact that the phrase {X, WP} asymmetrically c-commands Y and dominates X.



Uriagereka (1999) points out some fundamental problems with regard to the induction step of the LCA (1b), the most notable one being that it requires certain stipulations to ensure an asymmetric c-command relation between ‘sister’ nodes that c-command each other. Kayne’s (1994) original solution is to incorporate the category-segment distinction *à la* May (1985; see also Chomsky 1986) into structural representations and stipulate that any Spec/adjunct merger splits the target category into segments, rendering the ‘X’-node (the lower segment of the category) invisible for c-command (see Chomsky 1995 and Sheehan 2010, in press for similar approaches). Regarding Kayne’s stipulative solution as unexplanatory, Uriagereka (1999) claims that we should rather eliminate the induction step altogether from the LCA. He proposes that his simplified version of the LCA, one without the induction step (1b), imposes a rigorous constraint on syntactic derivation, namely that any structure of the form {XP, YP} such as (2b) is unlinearizable, and as such, excluded. Therefore, the LCA severely restricts the possible mode of application of Merge, in such a way that only structures that comply with (1a), *i.e.*, Command-Units, can be generated. As a result, Uriagereka’s simplified LCA forces the following constraint, which I will refer to as *Uriagereka’s (LCA-based) H- α schema*:

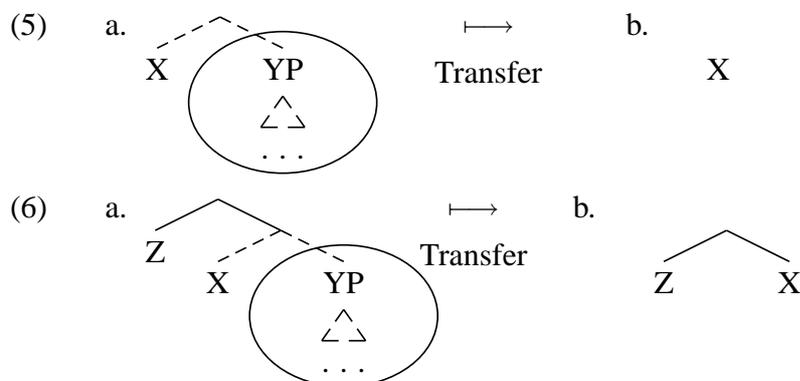
(3) *Uriagereka’s LCA-based H- α schema*:

Each application of Merge takes one LI, say H, and some other syntactic object (SO), say α , as its input, yielding {H, α }, where H precedes elements contained in α at PHON.

Notice immediately that (3) effectively bans *any* merger of two phrasal SOs. Thus, it predicts the following very strong constraint:

(4) *{XP, YP}: there can be no merger of two phrasal SOs.

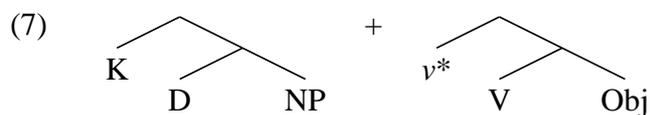
Although (4) is apparently a counterfactual claim, Uriagereka points to the important hypothesis that (4) is nevertheless a sustainable conclusion if syntax utilizes cyclic derivation by *phase*. Stated in the now familiar terminology introduced by Chomsky (Chomsky 2000 *et seq.*), *phases* are SOs whose completion immediately triggers *Transfer*. Transfer is an ‘interfacing’ operation which cyclically strips off the *interior* of the phase and send it to SEM and PHON, leaving only the *edge* of the phase in the derivational workspace for further computation. Assuming the standard theory of phase (Chomsky 2000 *et seq.*), the edge of a phase is defined as the head LI X (called the *phase head*) plus the specifier(s) of X if there is any (say Z in (6)), while the interior of the phase is the complement of X (YP in (5)/(6)). Thus, application of Transfer to the phase in (5)/(6) eliminates YP, effectively reducing the node {X, YP} to a simplex LI X.



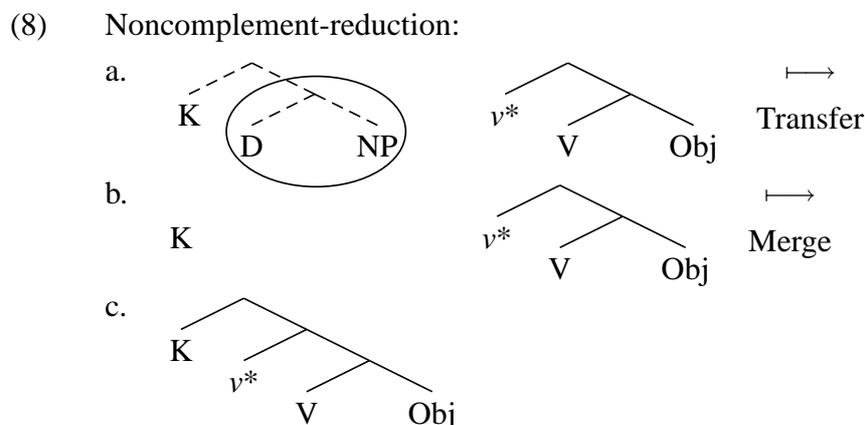
Then, provided that a phase is of the form {X, YP} without specifiers at its edge (as in (5)), cyclic Transfer in the Chomskyan sense can reduce the phase to a simplex LI X. Based on this hypothesis, I will attempt to (partially) transpose Uriagereka’s theory of the H- α schema into

the Chomskyan theory of phase cycles.

Now, consider, *e.g.*, the merger of the external argument to the edge of v^* , a typical instance of ‘XP-YP merger’. Following the growing body of literature (Bittner and Hale 1996a,b, Neeleman and Weerman 1999, Asbury 2008, Narita 2011, forthcoming and references cited therein), I assume that noun phrases are uniformly headed by the functional category K(ase) with an unvalued Case-feature [u Case] (cf. Chomsky’s 2007 n^*).¹



Such an instance of Merge would be a *prima facie* violation of the LCA-based H- α schema. However, if we assume that KP can constitute a phase, Transfer will reduce the subject KP-phase to a simplex terminal node K as in (8a). Then, the reduced K can be merged to the edge of v^* in conformity with the H- α schema. The relevant derivation is summarized in (8):



In general, provided that a phrasal noncomplement (specifier or adjunct) is a phase of the form $\{X, YP\}$, cyclic Transfer can reduce it to a simplex LI, whose merger complies with the simplified LCA (1a). In what follows, I will informally refer to such Transfer-based ‘atomicization’ of phasal noncomplements as *noncomplement-reduction*. (In the bare phrase structure framework, ‘complement’ and ‘noncomplement’ mean nothing more than ‘first-merged’ and ‘later-merged’ (Chomsky 1994 *et seq.*; see Chomsky 2007:11). Although these relational notions seem to play little role in linguistic theory, I will informally use them in this article mainly for expository purposes.)

For Uriagereka, noncomplement-reduction is a necessary derivational step that renders complex noncomplements compliant with his version of the LCA, or more specifically $*\{XP, YP\}$ (4). This claim can be summarized as follows.

(9) Merger of two phrases requires cyclic Transfer.

¹ The assumption that there is a phase-head LI above D is necessary to transpose Uriagereka’s ideas into the more standard phase theory introduced above. Uriagereka’s original claim was that Transfer (Spell-Out in his terms) applying to a noncomplement XP eliminates not just the complement of the phase head X but the entire phase SO, leaving only the ‘label’ (by assumption atomic) of the phase for further computation. Thus, it is fine for Uriagereka to assume that nominals that are always reducible to simplex nodes are DP-phases. By contrast, Chomskyan Transfer cannot reduce DP to a simplex D if D has a specifier (possessor, etc.) (recall (6)). Therefore, if Uriagereka is right in claiming that nominals are always reducible to simplex LIs, which I argue is basically on the right track, there must exist a separate category (K or the equivalent) above D and specifier(s) of D that heads the entire nominal phase. See also Narita (2011).

Cyclic Derivation by phase thus crucially serves for recursive embedding of noncomplements in his theory.

This paper will provide a number of supporting arguments for Uriagereka's hypothesis in (9). Building on the fact that empirical and conceptual problems regarding the LCA have been thoroughly examined in the literature (see Fukui and Takano 1998, Ackema and Neeleman 2002, Richards 2004, Abels and Neeleman 2009 and Narita 2010 among many others for much relevant discussion), however, this paper will question whether $*\{XP, YP\}$ (4) should be ultimately attributed to the LCA. I will rather argue that $*\{XP, YP\}$ (4) will make a number of empirically superior predictions, specifically regarding syntactic locality, if it is cast in the framework that is free from LCA-based linearization.

In this context, it should be noted, first of all, that the formidable nature of XP-YP structures has already been pointed out in the literature, on grounds quite independent of the LCA. See Chomsky (2010b,a) and Narita (2011, forthcoming) among others for relevant discussion. Also interesting is the fact that Kayne (2010) puts forward $*\{XP, YP\}$ as an independent principle of UG, in his attempt to eliminate recourse to the LCA in his latest theory of antisymmetry.

Second of all, Uriagereka's simplified LCA is by no means the only hypothesis to explain the effect of $*\{XP, YP\}$. For example, Narita (2011, forthcoming) puts forward an alternative, *LCA-free* conception of the H- α schema by making recourse to Chomsky's (2007, 2008) conception of the *edge-feature* (EF) of LIs. Chomsky (2008) hypothesizes:

“For an LI to be able to enter into a computation, merging with some SO, 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 states that (10) is the effect that any conception of EFs should capture.

(10) The EF is the feature that permits its bearer to be merged with some SO.

One way to make sense of (10) is to assume that the EF is the feature that constitutes the locus, or trigger, of Merge-application, a formulation reminiscent of the earlier ‘EPP-feature’ of Chomsky (1995) that states, “I need a specifier.” Generalizing to the merger of ‘complement’ along the line suggested by Chomsky, we may say that the EF is the property of LIs that states, “I may have a sister.”

More importantly, Chomsky also proposes a rather strong hypothesis regarding the distribution of EFs, which is (11):

(11) The EF is a property only of LIs.

This is also a natural assumption, given that LIs are the only linguistic elements stored in the mental lexicon. Thus, I agree with Chomsky in regarding (10) and (11) as a minimal set of assumptions.

Now, Narita (forthcoming, 2011) points out that once we adopt (10) and (11), (12) arises as a logical consequence, inevitable unless some further UG-enriching stipulation is provided:

(12) No phrases (non-LIs) have EFs.

As an illustration, imagine a simple derivation where syntax operates Merge on an LI X and a phrase YP. Thanks to the EF of X, so X is permitted to be merged with YP. The result is a set comprising them, namely a phrasal SO of the form {X, YP}. Importantly, the resulting SO is not an LI, thus by assumption (11), this phrasal SO is precluded from having an EF. In other words, projection/feature-percolation of an EF to a phrasal node is not a possibility:

(13) The EF does not undergo projection/feature-percolation.

$$\begin{array}{ccc} X_e + YP & \mapsto & \{X_e, YP\} \\ \text{Merge} & & (* \{X_e, YP\}_e) \end{array}$$

Given that the current minimalist literature pursues the possibility of eliminating labeling/projection from the theory of UG (see Collins 2002, Seely 2006, Chomsky 2004, 2007, 2008, Boeckx 2010, 2009, Narita 2009a, 2011, forthcoming for argument), (13) is certainly the null hypothesis. As Narita reasons, we are thus forced to conclude, by the combination of (10) and (13), that any instance of Merge must take an LI as at least one of its inputs, utilizing its EF to be merged to the other SO. All instances of Merge should then obey the form {H, α }, where H is an LI and α is an SO (an LI or a phrase). Thus the H- α schema (14) is deduced just as a theorem of (10) and (11).

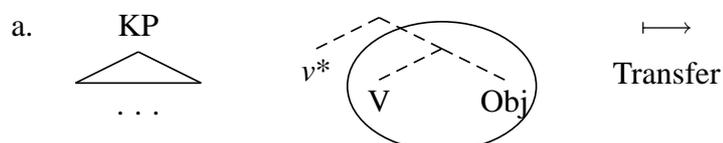
(14) *Narita's (LCA-free) H- α schema* (Narita 2011, forthcoming, to appear):

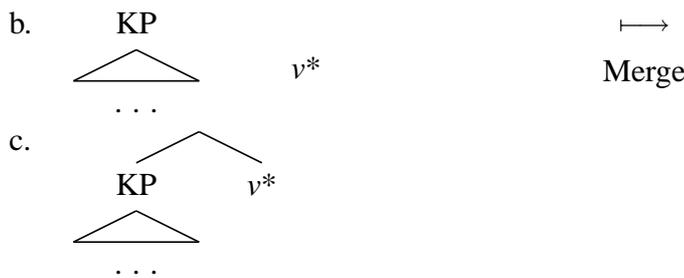
Each application of Merge takes an LI as its input, yielding {H, α } where H is an LI and α an SO.

In this line of reasoning, the H- α schema is thus deduced from the property of EFs, *without any recourse to the LCA* (see Fukui 2011 for criticism; see also Narita 2011, forthcoming, to appear for yet another deduction of the LCA-free H- α schema, based on a different but mutually supporting line of reasoning). Whether or not the H- α schema should be ultimately attributed to the LCA thus becomes an empirical question, and is one of the central topics that this paper will investigate below.

It should be pointed out that (14) makes different predictions as to how syntax cyclically Transfers the derivational cascades to the interfaces. First of all, just like Uriagereka's LCA-based H- α schema, Narita's LCA-free H- α schema also predicts $*\{XP, YP\}$, so cases like (7) are to be ruled out, unless either one of the XPs is reduced to a simplex LI by cyclic Transfer. To this end, noncomplement-reduction in (8) will suffice to render the apparent XP-YP merger compliant with the H- α schema, just like it does for Uriagereka's LCA-based H- α schema: it reduces the K-phase to a bare LI K, and K can utilize its EF again to be merged with the SO headed by v^* , conforming to the H- α schema. Here, I am assuming with Chomsky that the EF of LIs is uniformly undeletable throughout the derivation in syntax (Chomsky 2007:11). What is more, if we dissociate the H- α schema from the LCA, then not only noncomplement-reduction but also *complement-reduction*, *i.e.* cyclic Transfer of the would-be 'complement' XP, can lead to a derivation conforming to $*\{XP, YP\}$. As for (7), complement-reduction can be applied to eliminate the interior of the v^* -phase (VP) and reduce it to a simplex phase-head LI, which can then be merged with the subject KP. The relevant derivation is summarized in (15):

(15) Complement-reduction:





For Uriagereka, noncomplement-reduction is the only option whereby XP-YP merger in conformity with $*\{XP, YP\}$ can be achieved. In LCA-free syntax, by contrast, complement-reduction is as effective for the satisfaction of the H- α schema as noncomplement-reduction. Then, the two H- α schemata make different predictions with regard to the (un)availability of complement-reduction. In what follows, I will claim that the H- α schema will make a number of empirically superior predictions for the analysis of the CED effect on noncomplements, only if it is dissociated from the LCA.

3 The H- α Schema and the CED Effect

3.1 Complement-reduction and Transparent Subjects

Let's assume with Uriagereka (1999) and Chomsky (2000, 2004, 2008) that Transfer renders elements within the interior of the phase inaccessible to further syntactic operations (the *Phase-Impenetrability Condition*, PIC). Then, noncomplement-reduction and complement-reduction render the relevant noncomplement and complement an island for extraction, respectively.

Uriagereka claims that his LCA-based H- α schema forces syntax to execute noncomplement-reduction for all instances of “XP-YP” merger, and that this correctly deduces the effect of Huang's (1982) CED on specifiers and adjuncts (see also Nunes and Uriagereka 2000), as exemplified by (16).

- (16) a. **Who*₁ did [a picture of *t*₁] cause the problem?
 b. **Of whom*₁ did [a picture *t*₁] cause the problem?

Under his account of CED, then, every specifier XP, prototypically subjects, should constitute an island for extraction. However, this prediction is known to be too strong. For example, Stepanov (2007) reports a number of examples from various languages that exhibit subextraction from subjects. Here I provide some relevant examples from Japanese that shows subextraction from the (sentential) external argument.

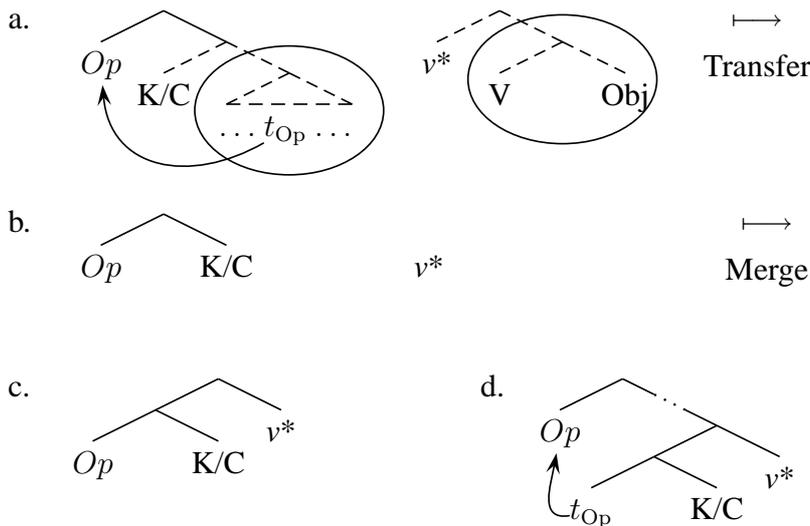
- (17) *Japanese*:
- a. Cleft
 [*Op*_{*j*} [John-ga *t*_{*j*} okane-o karita koto]-ga Bill-o kizutuketa
 John-NOM money-ACC borrowed NML -NOM Bill-ACC hurt
 no]-wa *Mary-kara*_{*j*} datta.
 NML -TOP Mary-from CPL.PAST
 “It was *from Mary*_{*j*} [*Op*_{*j*} that [that John borrowed money *t*_{*j*}] hurt Bill].”
- b. 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].*”

Adopting the standard assumption that the external argument (sentential or not) is base-generated at Spec- v^* , the sentential subject in these examples should constitute a bona fide example of a noncomplement that does not undergo Transfer prior to the subextraction of a null operator. Such a ‘transparent’ noncomplement should have no place in Uriagereka’s LCA-based account.

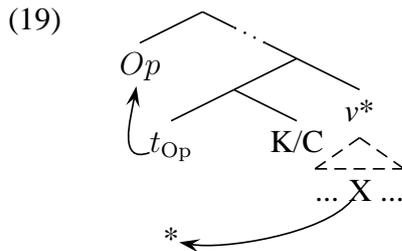
However, Narita’s (2009b, forthcoming) LCA-free $H-\alpha$ schema does provide an account of CED effects that incorporates the basic tenet of Uriagereka’s analysis but still accommodates the existence of transparent noncomplements. According to the LCA-free $H-\alpha$ schema, the external merger of two phrases, say XP and YP, is impossible unless either XP or YP is reduced to a simplex LI by means of cyclic Transfer. Unlike Uriagereka’s analysis in terms of the LCA, Narita’s $H-\alpha$ schema does not specify which phrase Transfer should apply to. Thus, complement-reduction as well as noncomplement-reduction are both available options for achieving the relevant external merger. Specifically, the choice of complement-reduction at the external merger of subject XP and v^* as in (7) will keep the former accessible for further computation, allowing subextraction of Op . The derivation is sketched in (18) (here, I adopt the now widely accepted assumption that subjects can stay in-situ in Japanese; see Kuroda 1988, Fukui 1986/1995, 1988, Fukui and Speas 1986, Lasnik and Saito 1992 among many others):

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



Thus, Narita’s LCA-free $H-\alpha$ schema is compatible with the existence of transparent noncomplements, as long as the complement domain can constitute a phase for cyclic Transfer.

Note incidentally that, in Narita’s approach, it is predicted that the choice of complement-reduction here is a prerequisite for later subextraction from the subject external argument as in (17). Therefore, the relevant v^* P must be ‘atomizable’ by cyclic Transfer ($\{v^*, VP\} \rightarrow v^*$), which means that it cannot assume any specifier position as an ‘escape hatch’ for successive cyclic movement. Then, the prediction is that complement-reduction at (18a) renders the relevant v^* -phase an island for extraction.



Japanese provides crucial evidence in favor of this novel prediction. (20) gives a relevant minimal pair from Japanese cleft constructions ((20a) = (17a)).

(20) *Japanese*: Cleft and scrambling

- a. [Op_j [John-ga t_j okane-o karita koto]-ga Bill-o kizutuketa
 John-NOM money-ACC borrowed NML -NOM Bill-ACC hurt
 no]-wa *Mary-kara_j* datta. (= (17a))
 NML -TOP Mary-from CPL.PAST
 “It was *from Mary_j* [Op_j that [that John borrowed money t_j] hurt Bill].”
- b. *? [Op_j Bill-o_i [John-ga t_j okane-o karita koto]-ga t_i kizutuketa
 Bill-ACC John-NOM money-ACC borrowed NML -NOM hurt
 no]-wa *Mary-kara_j* datta.
 NML -TOP Mary-from CPL.PAST
 “It was *from Mary_j* [Op_j that Bill_i, [that John borrowed money t_j] hurt t_i].”

Recall first that Japanese does allow subextraction from external arguments, as shown in (20a). Specifically, we can construct a cleft sentence (20a) from the underlying sentence comparable to (21a) by A'-movement of Op out of the sentential external argument.² In addition, it is widely known that Japanese allows optional scrambling of an object to a sentence initial position, thus, *ceteris paribus*, such alternation between (21a) and (21b) is freely available in this language.

(21) *Japanese*:

- a. [John-ga *Mary-kara* okane-o karita koto]-ga Bill-o kizutuketa.
 John-NOM *Mary-from* money-ACC borrowed NML -NOM Bill-ACC hurt
 “[That John borrowed money from *Mary*] hurt Bill.”
- b. Bill-o_i [John-ga *Mary-kara* okane-o karita koto]-ga t_i
 Bill-ACC John-NOM *Mary-from* money-ACC borrowed NML -NOM
 kizutuketa.
 hurt
 “Bill_i, [That John borrowed money from *Mary*] hurt t_i .”

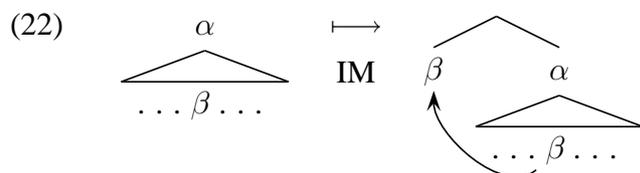
I follow with the standard assumption that object scrambling can target either an outer Spec- v or some higher position (say Spec-T or Spec-C) (Kuroda 1988, Fukui 1986/1995, 1988, Fukui and Speas 1986, Saito 1992, Saito and Fukui 1998 among many others). Application of scrambling is purely optional in most cases (Saito 1989, Saito and Fukui 1998), and it usually does not interfere with any other syntactic operation. However, the curious fact remains that scrambling of the object crossing the sentential subject is disallowed in (20b), where a null operator moves out of the sentential subject. This state of affairs is indeed predicted by Narita’s LCA-free H- α schema: subextraction of Op from the subject CP entails that complement-reduction has rendered the v^* -phase an island for extraction, thus even scrambling cannot apply to elements

²See Hoji (1990), Ishii (1997) on null-operator A'-movement in Japanese clefts.

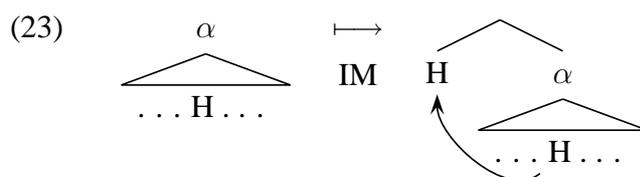
within the v^* -phase. No previous account of CED made predictions on the existence of any ‘complement island’ of the sort in (19), which lends further support for Narita’s account of the CED effect based on the LCA-free H- α schema.

3.2 Freezing effects

In the framework of bare phrase structure, the movement transformation is reduced to *internal Merge*, which creates a new occurrence of a moving SO to the edge of the target SO, leaving a copy of the former in its original position, which yields the *remerge/copy theory of movement* (Chomsky 1993, 1995). Internal Merge comes as free as external Merge, since only stipulations can preclude Merge from taking as its input either two independently constructed SOs (external Merge) or two SOs one of which is contained within the other (internal Merge). Recall that the hypothesis that the EF is a property only of LIs (11) derives the H- α schema (14). Our discussion so far was restricted to cases of external Merge, but the same H- α schema should apply to cases of internal Merge as well. Consider an internal merger of β to the edge of α , as schematized in (22).



Here, α contains an original occurrence of β , and the application of internal Merge creates another occurrence of β to the edge of α , leaving the copy of β in its original position. How can such an application of internal Merge comply with the H- α schema? Crucially, note that α here is by definition a phrasal/non-LI SO, given the very fact that it contains an occurrence of another SO, namely β . Then, it follows from the H- α schema that the moving SO, namely β , must be a simplex node, since instances of XP-YP merger are precluded by the H- α schema as we saw above. Thus, any instance of internal Merge must actually take the following form, where β is restricted to a simplex node (H).



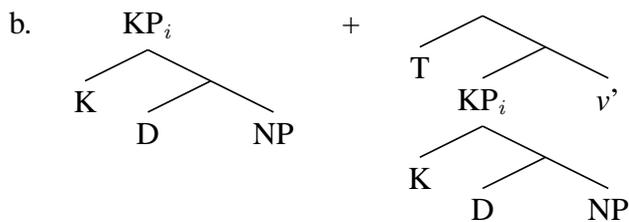
We are thus forced to conclude (24):

(24) Only simplex LIs can undergo internal Merge.

Prima facie, any instance of ‘XP’-movement would seem to falsify (24). However, recall that the previous section points to the conclusion that apparent cases of XP-YP merger are still compliant with the H- α schema, as long as either one of the two XPs can constitute its own phase, utilizing cyclic Transfer to be reduced to a simplex LI with an EF. The same should hold for cases of internal Merge, too.

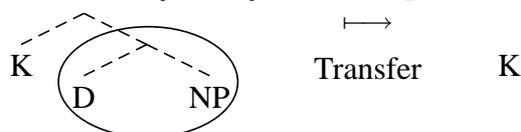
Consider, for example, a case of movement in (25a), where apparent ‘XP-YP’ internal merger in (25b) is supposed to occur.

(25) a. [*the boy*]_{*i*} *t_i* hit Mary.



Although XP-YP merger is excluded by the H- α schema, note that the moving constituent is headed by a phase head K. Assume that as early as the completion of the K-phase, the complement of K gets Transferred, rendering the subject a bare LI K. Then, what T attracts in the later derivational step is just a bare LI K. K can thus move to the ‘EPP’ specifier-position while still conforming to the H- α schema. The relevant derivation is sketched below.

- (26) a. Transfer of {D, NP} at the completion of the K-phase.



- b. Recursive Merge builds T'. c. IM



Thanks to the phase-head status of K, the relevant instance of A-movement can also be attributed to the H- α schema-based account (as for phrasal A'-movement, see Narita (2011) for relevant analysis, partially based on Cable's (2007, 2010) Q-head).

More generally, as long as syntax can utilize cyclic Transfer to keep the moving element simplex, then syntax can still apply internal Merge in such a way that it still conforms to the H- α schema. Accordingly, all instances of apparent phrasal movement must be analyzed as instances of internal Merge of a phase-head LI that has Transferred its phase-interior domain. Then, it is predicted that all moved ph(r)ases exhibit the *freezing effect* (Culicover and Wexler 1980 and many others):

- (27) A moved phase constitutes an island for extraction.

This is simply because all the moved ph(r)ases must have become simplex nodes (without any specifier) by means of cyclic Transfer before the application of internal Merge. Thus, the H- α schema, whether it is tied with the LCA or not, derives the effect of (27) for free.

Indeed, there are a number of reported facts that support the freezing effect (27): see Ross (1974), Culicover and Wexler (1980), Culicover (1982), Chametzky (2000), Corver (2006), Narita (forthcoming, 2011) among many others. For example, it has been observed by a number of researchers that an in-situ subject is not an island, whereas a raised subject is. (28) illustrates this observation.

- (28) (Lasnik and Park 2003)
- Which candidate_i* were there [posters of *t_i*] all over the town?
 - **Which candidate_i* were [posters of *t_i*]_{*j*} *t_j* all over the town?

The contrast in (29) is another clear case in point, which shows that CP moved to the Spec-T position resists A'-subextraction.

- (29) a. *Who_i* is it obvious [that John likes *t_i*]?
 b. **Who_i* is [that John likes you]_{*i*} *t_i* obvious?

In general, then, the islandhood of EPP-raised subjects emerges as a result of internal Merge, as readily predicted by the freezing effect (27). (NB: To provide a full-fledged account of freezing effects, we will need to supply another constraint that I refer to as $*\{t, t\}$. See Narita (2011) for relevant discussion.)

Note that the freezing effect can be derived from either the LCA-based or the LCA-free H- α schema, given that internal Merge always relocates an SO to a specifier position. However, these two H- α schemata make different predictions about unmoved specifiers. Suppose we have an externally merged specifier XP (say an external argument) which is to be dislocated to some higher specifier position. In Uriagereka's (1999) LCA-based system, this XP undergoes Transfer and becomes a simplex node before being externally merged to the base specifier position, because noncomplement-reduction always applies at any XP-YP merger in this approach. Thus, strictly speaking, there is no freezing effect on specifiers predicted by his approach, since it predicts that any noncomplement should constitute an island for extraction anyway, regardless of whether it moves later or not. However, in Narita's approach, the option of complement-reduction can save the relevant specifier XP untransferred at the point of external Merge, as we have seen above. The only restriction by the H- α schema in the latter approach is that this XP must be reduced to a simplex node by means of cyclic Transfer before moving to some edge position. Thus, Narita's approach predicts that the freezing effect arises only for moved noncomplements.

A contrast relevant to these predictions arises in pre- v.s. post-verbal subject KPs in Spanish (see Uriagereka 1988, Gallego 2007, 2010 for discussion). The data here show that subextraction from post-verbal external arguments is strongly preferred to subextraction from preverbal ones.

- (30) *Spanish*: transparent postverbal subject (Uriagereka 1988:116; see also Gallego 2007, 2010)
- a. * [de qué conferenciantes]₁ te parece [que [las propuestas *t₁*]
 of what speakers CL-to-you seem.3SG that the proposals
 me van a impresionar].
 CL-to-me go-3PL to impress
 "Of which speakers does it seem to you that [the proposals *t*] will impress me."
- b. (?) [de qué conferenciantes]₁ te parece [que me van a
 of what speakers CL-to-you seem.3SG that CL-to-me go-3PL to
 impresionar [las propuestas *t₁*]].
 impress the proposals
 "Of which speakers does it seem to you that will impress me [the proposals *t*]."

Gallego (2007, 2010) provides argument that the postverbal subject in these examples stays at the base-generated Spec- v^* position whereas the preverbal subject moves to Spec-T. Then, the relevant contrast in (30) should be attributed to the freezing effect on the external argument, which arises only in Narita's H- α schema. Here too, then, it is shown that the H- α schema provides a better account of the freezing effect in LCA-free syntax.

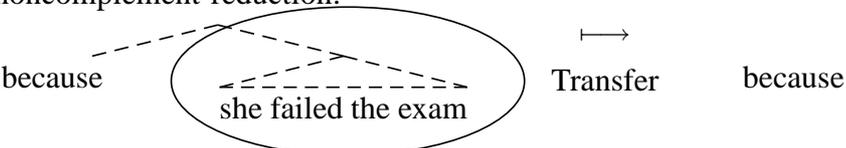
3.3 Complement-reduction and Transparent Adjuncts

So far, I have put aside considerations regarding adjuncts, but the null hypothesis is arguably that the H- α schema also holds for adjunction. Specifically, according to the H- α schema, there is no XP-YP merger, regardless of whether the merger is an instance of ‘substitution’ (argument-merger) or adjunction.³ Consider, for example, adjunction/pair-Merge of an adverbial *because*-clause in (31):

(31) The man criticized Mary [because she failed the exam].

Adverbial clauses like the one in (31) are obviously phrasal, so external merger of an adverbial clause and the main clausal spine would count as an instance of XP-YP merger, and the H- α schema necessitates Transfer of either one of the XPs. If noncomplement-reduction is chosen, the adverbial *because*-clause is reduced to an LI. For expository convenience, I simply assume that *because* is the relevant phase head, but see Emonds (2009) for the potentially relevant hypothesis that most adjuncts are indeed headed by (often covert) P (adposition).

(32) noncomplement-reduction:



In conformity with the H- α schema, application of noncomplement-reduction in effect enables the external merger in (37).

Noncomplement-reduction is presumably responsible on the CED effect for adjuncts (see Cattell 1976, Huang 1982, Chomsky 1986, Uriagereka 1999), as suggested by Uriagereka (1999) (see also Nunes and Uriagereka 2000).

- (33)
- a. *This is the girl_i that John failed the test [because he was thinking about *t_i*].
 - b. *I know what_i the man criticized Mary [after she said *t_i*].
 - c. *It was this flaw_i that the man criticized Mary [due to *t_i*].

Uriagereka claims that the CED effect on adjuncts are readily attributed to the obligatoriness of noncomplement-reduction for these adjuncts. As we will see shortly, I will essentially follow his reasoning and attribute the unacceptability of the examples in (33) to obligatory noncomplement-reduction.

Contra the widely accepted view that adjuncts are always strong islands (see Cattell 1976, Huang 1982, Chomsky 1986, Uriagereka 1999), however, it has been observed that not all adjuncts exhibit CED effects (see Chomsky 1982, Boeckx 2003, Truswell 2007a,b among many others). Truswell (2007a,b) provides a thorough survey of subextraction from adjuncts. Some examples are reproduced in (34).

- (34) (Truswell 2007a,b)
- a. *Which book_i* did John design his garden [after reading *t_i*]?
 - b. *What_i* did John arrive [whistling *t_i*]?
 - c. *What_i* did John drive Mary crazy [trying to fix *t_i*]?
 - d. *Who_i* did John travel to England [to make a sculpture of *t_i*]?
 - e. *What_i* did Christ die [in order to save us from *t_i*]?

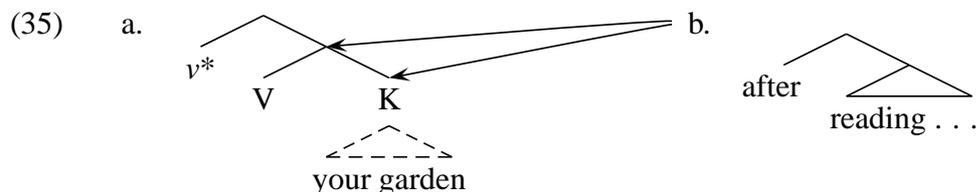
³Chomsky (2004) proposes that these two types of Merge correspond to *set-Merge* and *pair-Merge*, respectively.

These examples transparently show that the theory should not characterize adjuncts as exceptionless islands, contra Huang (1982), Uriagereka (1999), Nunes and Uriagereka (2000), Chomsky (2004), and Stepanov (2007). Thus, Uriagereka’s LCA-based theory of the H- α schema is unsustainable, which claims that noncomplement-reduction always applies and renders adjuncts exceptionless islands.

In terms of the H- α schema-based account, these examples show that certain adjuncts, including bare and PP gerundives (e.g., *(after) reading the textbook*) and purpose-clauses (e.g., *in order to save us from the guilt*), are allowed not to undergo reduction to a simplex node at the point of adjunction. How can we ensure this result, while still keeping the H- α schema-based account of adjunct condition effects for cases like those in (33)?

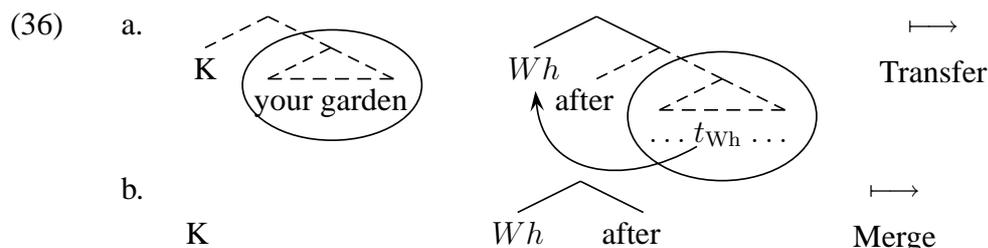
I would like to propose that transparent adjuncts such as those in (34) are allowed to adjoin low in the clausal spine, below v/v^* , unlike adverbial clauses such as the ones headed by *because*, which I assume adjoin to positions higher than v/v^* . I claim that this difference in adjunction sites allows us to make the cut between the former class of ‘low’ adjuncts in question (exempt from CED effects) and the latter class of ‘high’ adjuncts (exhibiting CED effects).

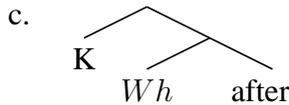
First, consider cases with transparent adjuncts, e.g., the adjunction of the PP-gerundive *after reading* (*which book*) in (34a).



By assumption, the adverbial is a type of ‘low’ adjunct that can be adjoined within the domain c-commanded by v^* . For the case in question, I argue that there are two potential adjunction sites, either to $\{V, K\}$ or to K, with K being a phase-head residue of its own phase. I specifically assume that such adjuncts can adjoin *as low as in the sister of K*. Given that it is outside of the phase of K but still in the scope of v/v^* , there is no principled ground that excludes this position from being a potential adjunction site.

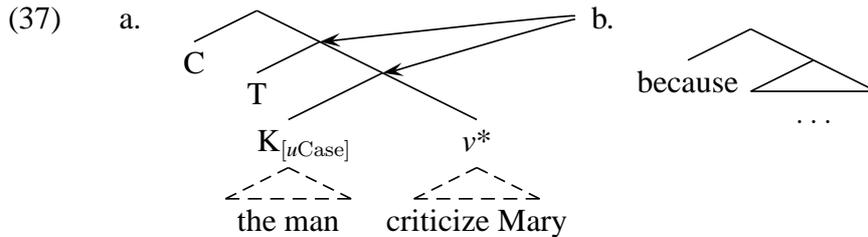
(35) is a case of ‘XP-XP’ merger, thus the H- α schema requires cyclic Transfer to reduce at least one of the XPs to a simplex LI. In order for the Wh-operator to undergo successive cyclic movement to the edge of interrogative C, it should first evacuate to the edge of the ph(r)ase in (35b). As a result, the adverbial ph(r)ase, assuming a specifier, can never be reduced to a simplex LI. The H- α schema therefore predicts that it should be the target of adjunction in (35a) that should be reduced to an LI. While the node $\{V, [K\dots]\}$ is not a suitable candidate for a phase, given the unvalued Case-feature on K that will lead the derivation to crash if sent to SEM, the reduction of the K-phase to K via cyclic Transfer is feasible, assuming the Theme KP constitutes its own phase without an edge. The derivation is schematically shown in (36).



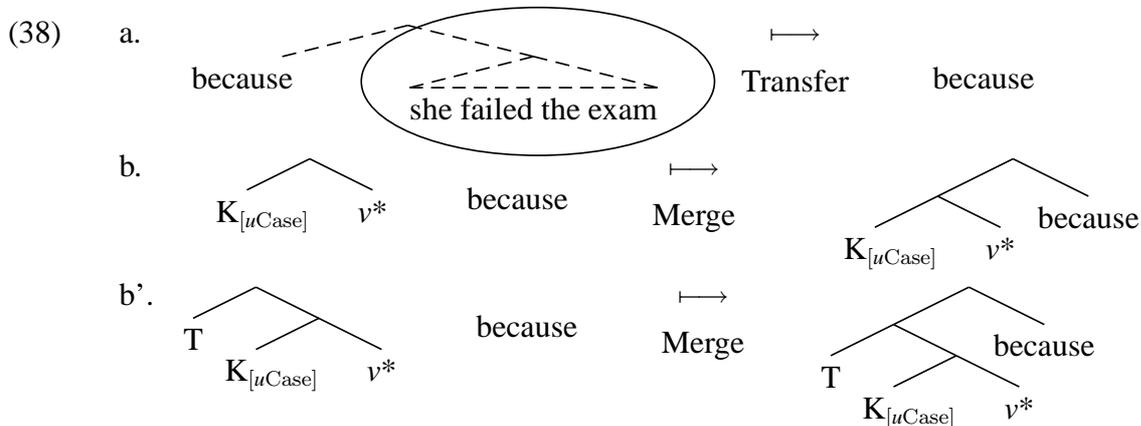


This reduction allows the edge of the adverbial to remain accessible for further operations, a desirable result.

On the other hand, I assume that high adverbials that show CED-effects, like finite clauses headed by *because* or *after*, are adjoined relatively high in the clausal spine, specifically positions that can take scope over v/v^* .⁴ This adjunction would take the form of (37):⁵



Here, I claim that reduction of the adverbial clause (37b) to an LI is necessitated by the $H-\alpha$ schema. The reason is the presence of the uninterpretable Case-feature on the subject K . There is evidence that Nominative Case assignment by T is contingent on the presence of C (Iatridou 1993, Watanabe 1996; Richards 2007 and Chomsky 2007, 2008 specifically argue that the unvalued φ -features responsible for Nominative Case valuation are introduced by C and inherited onto T). The uninterpretable Case-feature of the subject K remains unchecked until the introduction of the phase head C , and so neither of the potential adjunction sites indicated by arrows in (37) can define a convergent phase. Therefore, it is impossible for these phrases to be reduced to simplex LIs by means of cyclic Transfer, and the $H-\alpha$ schema forces syntax to execute reduction of the adverbial (37b) to achieve external merger in (37).

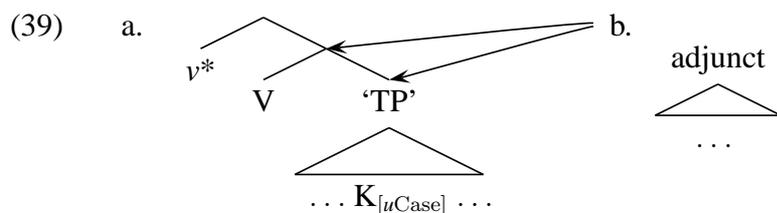


⁴The Condition C effect in examples like *He_{*i} got sick {because/since/after} John_i ate that fish* shows that these adjuncts are necessarily located below the subject (which is at so-called ‘Spec-T’) at SEM, thus it seems that adjunction of these adverbial clauses to a position that is not c-commanded by the raised subject is precluded for some independent reason. If we assume with Chomsky (2007, 2008) that every operation except EM takes place at the phase level, it naturally follows that EM of the adverbial to T' or v^*P necessarily precedes the introduction of C and the EPP-driven subject raising. Alternatively, we may resort to Higginbotham’s (1985) hypothesis that $T/INFL$ is the locus of the existential closure of event variables and thus it is required to scope over all the adjuncts whose event variables it binds.

⁵Adjunction to the subject K in this context is precluded, because it would result in a structure like $\{\{K, adjunct\}, v^*\}$, locating the relevant high adjunct under the scope of v/v^* . This by definition violates the above-mentioned condition on the scope of high adjuncts.

Consequently, the adverbial phase cannot assume any edge for successive-cyclic movement, precluding subextraction.

Moreover, I would like to point out that the H- α schema-based account makes a novel prediction that adjunction of transparent low adjuncts is unavailable for ECM-clauses. If we assume with Chomsky (1995, 2000, 2007, 2008) that the subject of the infinitival clause receives Accusative Case from v^* in the ECM construction (see already Chomsky 1981; see also Postal 1974, Lasnik and Saito 1991 for the raising-to-object analysis of ECM), the configuration to which the low adjunct adjoins will have the following form.



The unvalued Case-feature of K within the ECM infinitival effectively makes any of the potential adjunction sites in (39a) nonconvergent, thus the H- α schema again predicts that the low adjunct (39b) should constitute a phase without an edge (reducible to an LI by Transfer), prohibiting subextraction out of it. This prediction is indeed borne out by the unacceptability of (40a) (Bridget Samuels, *p.c.*):

- (40) a. *?*Which trial_i did the DA prove [the suspect to have been at the scene of the crime] [in order to conclude t_i]?*
 b. *Which trial_i did the DA prove [that the suspect was at the scene of the crime] [in order to conclude t_i]?*
 c. *Which trial_i did the DA decide [to call the suspect for psychiatric examination] [in order to conclude t_i]?*

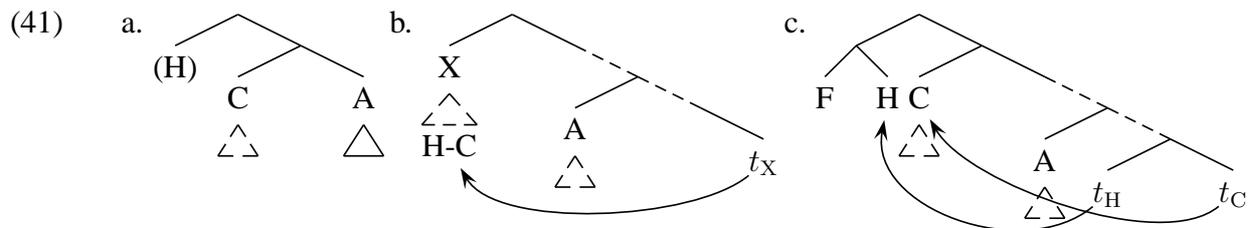
Crucially, note the contrast between (40a) and (40b)–(40c). On the one hand, the finite *that*-clause in (40b) is a CP that can constitute its own phase without an edge (*that* being the complementizer). Hence, its reduction to an LI can support a convergent derivation involving subextraction from the low adjunct. The same applies to the control infinitival CP [*PRO to call the suspect for psychiatric examination*] in (40c). On the other hand, ECM-infinitival TP cannot define its own phase due to the unvalued Case-feature on the raising object *the suspect*, thus its necessarily phrasal status precludes WH-subextraction from the low adjunct. The data in (40) hence constitute another piece of strong support for the H- α schema-based account of the adjunct condition effect.⁶

So far, we abstracted away our discussion of the H- α schema from the LCA. What happens if we employ Uriagereka’s LCA-based H- α schema in the discussion above? Recall that under Uriagereka’s system, noncomplement-reduction is driven by the LCA-based linearization requirement at PHON. It essentially applies to reduce adjuncts to simplex nodes that can independently asymmetrically c-command the other LIs. Note that the LCA should always map these asymmetric c-command relations to precedence, thus any adjunct should always precede

⁶Importantly, (40a) and (40b) are virtually identical as far as their semantic interpretations are concerned, and so the contrast in this minimal pair constitutes a strong piece of evidence that the nature of the contrast is *syntactic* rather than semantic or extra-grammatical. Thus, it speaks against one of the most detailed studies of the (un)availability of subextraction from adjuncts, namely Truswell (2007a,b), which puts forward a semantico-centric account of relevant facts. See Narita (2011, forthcoming) for further discussion.

the LIs within the relevant Command-Unit it is adjoining to. That is, adjunction should always be ‘to the left’. This consequence, unavoidable if the H- α schema is tied with the LCA, is highly problematic in its empirical import.

First of all, all apparent cases of ‘rightward adjunction’ that surface with the H(ead)-C(omplement)-A(djunct) order (as in, e.g., *John* [_H *called*] [_C *Mary*] [_A *before Sue came*] in English) must be reanalyzed either as (i) involving the relevant adjunct as a bona fide complement, (ii) involving movement of the constituent comprising H-C over (left-adjoined) A, or (iii) involving ‘XP’-movement of C over A and ‘head’-movement of H over A.



Advocates of the LCA thus bear a serious burden of proof: they must show that *all* apparent cases of rightward adjunction are best analyzed as involving any of these structural representations, and moreover that such structural analyses can be naturally acquired by children through impoverished primary linguistic data. We have never seen in the LCA literature any serious justification of such *ad hoc* reanalyses, which is already quite indicative of empirically inadequate nature of the LCA. See Fukui and Takano (1998), Ackema and Neeleman (2002), Richards (2004), Abels and Neeleman (2009) and Narita (2010) for further discussion.

Moreover, advocates of the LCA must be ready to allow massive parametric variations with regard to the availability of movement of the sort in (41). It has been long known since Fukui (1993) that the directionality of adjunction rather strongly correlates with the value of head-parameter of the language in question: Rightward adjunction is quite free in head-initial languages like English, whereas leftward adjunction is freely available in head-final languages like Japanese.

- (42) a. John hugged Mary [*passionately*] [*without hesitation*] [*out of love*]
 b. *John ... [*passionately*] [*without hesitation*] [*out of love*] hugged Mary.
 c. John-ga ... [aizyoo-kara] [tamerai-naku] [zyoonetuteki-ni] Mary-o
 John-NOM love-from hesitation-without passionately Mary-ACC
 dakisimeta.
 hugged
 d. *John-ga Mary-o dakisimeta [aizyoo-kara] [tamerai-naku] [zyoonetuteki-ni]

Thus, if advocates of the LCA manage to capture the pattern in (42a) by any of the analyses in (41), they must also account for why the same analysis is unavailable in a comparable ‘head-final’ language.

Furthermore, even if we tentatively grant that these challenges can be met in some way or the other, further considerations quickly show that the derivations in (41) make wrong predictions as to the islandhood of C. In Uriagereka’s system, it is necessary to apply Transfer to C to form any of (41), given that C or H-C occupies a noncomplement position, either by external or internal Merge (recall the discussion on the freezing effect in §3.2). This should mean that any C in the H-C-A word order should constitute an island for extraction, an obviously incorrect result in face of examples like (43).

- (43) a. *What*₁ did Mary [_H write] [_C a book about *t*₁] [_A before she became a linguist]?
 b. *Who*₁ did you [_H find] [_C the letter to *t*₁] [_A before Mary received it]?

Countless other examples of the relevant sort can be produced easily. These examples transparently falsify the analysis in (41a), and those in (41b) and (41c) would also be ruled out unless we further stipulate a considerable amount of ‘look-ahead’ A- and A’-movement that must apply before the Transfer of C. In such a system, moreover, the A v.s. A-bar distinction of movement cannot be attributed to the distinction between phase-internal and interphasal movement as suggested by Chomsky (2007, 2008), thus further complication seems unavoidable. I cannot provide a rigorous proof that no such analysis is tenable, but it is advocates of the LCA that should bear the burden of argument that such *ad hoc* analyses are indeed on the right track.

4 Remarks on Sheehan’s Resuscitation of the LCA

Our discussion so far indicates that the H- α schema-based account of CED effects, though first envisaged by Uriagereka (1999) as a corollary of the LCA, can be best achieved in syntax without the LCA. Narita (forthcoming, 2011) specifically proposes to deduce the LCA-free H- α schema from the overarching hypothesis that there is no mechanism of projection in bare phrase structure (see also Collins 2002, Seely 2006, Chomsky 2007, 2008, Boeckx 2010, 2009, Narita 2009a, to appear, Fukui 2011 for relevant discussion). Indeed, readers can easily observe that the H- α schema in the discussion above makes no recourse to projection/labeling, and hence that it can be naturally employed in the simpler theory of projection-free syntax.

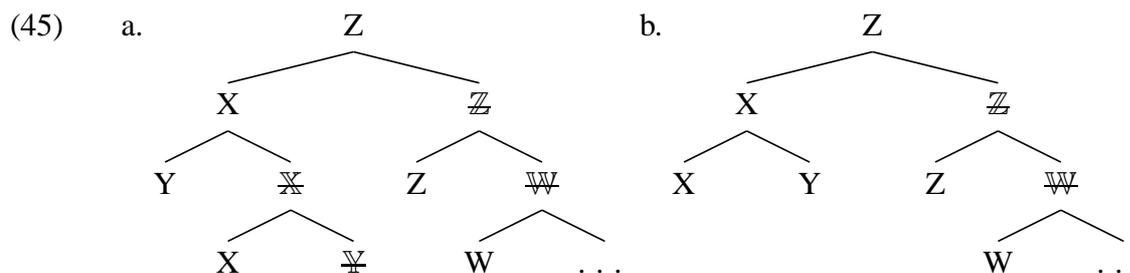
Interestingly, Sheehan (2010, in press) takes a different approach toward resuscitating Uriagereka’s LCA-based account of CED effects. Instead of eradicating it, she contends that Uriagereka’s simplified LCA should be supplemented by a specific copy theory of labeling.⁷ She puts forward the following set of assumptions:

- (44) a. The label X of an SO Σ is literally a copy of the head X of Σ .
 b. C-command is defined in such a way that a label X of Σ by itself c-commands the LIs within the sister of Σ .
 c. Problematic labels/copies are deleted at PF as a last resort in order to enable LCA-based linearization.
 d. PF-deletion of labels/copies is governed by some economy principle *à la* Nunes (2004) that favors deletion of lower copies over higher copies.

Consider, *e.g.*, the following labeled tree diagrams, which according to Sheehan represent an externally merged head-final and head-initial specifier XP of ZP. As is a familiar move in the literature of the LCA, Sheehan assumes that the surface head-final word order C-H is derived from the underlying head-initial order H-C by moving C to the specifier of H. To take a representative approach, Kayne (1994) proposes that c-selection forces ubiquitous roll-up complement-to-specifier movement in head-final languages, a proposal adopted by Sheehan.⁸

⁷The idea that labeling really is copying of head LIs goes back to as early as Chomsky (1994, 1995).

⁸Note that Uriagereka’s system makes an apparently wrong prediction that this obligatory complement-to-specifier movement should render every complement an island for extraction. Sheehan attempts to avoid this problem in an interesting way but unsuccessfully, as we will see shortly.



The nodes marked by outline typeface indicate the copies of LIs/labels that undergo deletion at PF. Sheehan specifically proposes that, thanks to (44c), one of the labels that symmetrically c-commands some other LI/label is deleted at PF. This copy-deletion process prefers to apply to ‘bar-level’ copies rather than to ‘XP-level’ copies by assumption (44d), thus the intermediate label Z rather than the maximal X label is deleted at PF. By (44b), the label X of XP can directly c-command Z and W in (45a/b), and thus the LCA gives rise to the ordering $X \rightarrow Z \rightarrow W \rightarrow \dots$ at PF. Moreover, as for the head-final specifier XP in (45a), the complement-to-specifier movement of Y enables Y to asymmetrically c-command X, leading to $Y \rightarrow X$ at PF. Sheehan argues that the combination of these two instructions are sufficient to get the total linear ordering $Y \rightarrow X \rightarrow Z \rightarrow W \rightarrow \dots$, and therefore that noncomplement-reduction is not forced by the LCA to apply to head-final specifiers. Note that the situation is different for head-initial specifiers as in XP in (45b). Here, the two comparable linearization instructions, $X \rightarrow Y$ and $X \rightarrow Z \rightarrow W \rightarrow \dots$, are still insufficient to derive the total ordering, hence structures like (45b) are not linearizable in terms of the LCA. Sheehan claims that noncomplement-reduction is thus forced to apply to head-initial specifiers. This way, Sheehan draws the conclusion that the CED effect due to forced noncomplement-reduction arises only for externally merged head-initial noncomplements. Her system thus can rule in acceptable cases of subextraction from subjects in Japanese and other head-final languages reported in the literature (see Stepanov 2007), whereas the canonical CED effect for subjects in head-initial languages like English is still correctly derived from noncomplement-reduction.

Sheehan’s label-based resuscitation of the LCA makes an interesting contrast with our eradication of the LCA from the H- α schema. In what follows, I would like to point out some problems related to Sheehan’s approach.

First of all, because Sheehan advocates for the LCA, her theory inherits all the empirical problems attributed to the LCA. For example, she has to face serious problems like those regarding rightward adjunction discussed above (see Sheehan in press:§6 for some relevant but inconclusive discussion). See Fukui and Takano (1998), Ackema and Neeleman (2002), Richards (2004), Abels and Neeleman (2009) and Narita (2010) for further discussion.

Second, Sheehan’s claim that Uriagereka-type noncomplement-reduction obligatorily applies to head-initial specifiers upon EM is empirically too strong. To take one example, recall the Spanish datum in (30b), which show that subextraction from post-verbal external arguments is quite acceptable. Spanish is a *bona fide* head-initial language, thus Sheehan’s theory predicts that specifiers in this language undergo noncomplement-reduction upon EM and become islands for subextraction. External argument KPs should constitute islands under the standard assumption that they are base-generated at Spec- v^* , but the acceptability of (30b) clearly shows that the external argument in the postverbal subject position (in-situ Spec- v^* , as argued by Gallego 2007, 2010) allows subextraction, contra Sheehan’s analysis.

Last but not least, the central issue is again that reference to labels/projections is bound to be a departure from the SMT in bare phrase structure. Indeed, the assumptions which Sheehan adopts in (44) are technical complications that cannot be reasonably sustained in the pursuit of

the minimal theory of bare phrase structure. Labeled tree-diagrams are just informal proxies for rigorous set-theoretic representations, however familiar they might look due to the 60 years of linguists' conventions. No such structural representations can be generated in bare phrase structure where the sole structure-building operation is recursively applicable Merge, just a set-formation operation. Cast in a more accurate set-theoretic representation, the structures in (45) are nothing more than (46), where no natural places for representational labels are provided:

- (46) a. $\{\{\{Y, \{X, Y\}\}, \{Z, \{W, \dots\}\}\}$
 b. $\{\{\{X, Y\}, \{Z, \{W, \dots\}\}\}$

Nonetheless, it is crucial to Sheehan's approach that LIs can extend their c-command domain beyond their sisters by the medium of copies that are assigned (as labels) to certain complex syntactic objects (her (44a) and (44b)). Sheehan (2010, in press) proposes that her 'projection algorithm' formulated as (47) can derive the effect of (44a) and (44b):

- (47) If X selects and merges with Y then copy (the interpretable/unvalued features of) X to dominate $\{X, Y\}$.

However, it is not clear where X should be copied to, nor whether this copying process is achieved by IM or a totally different operation. No further exposition (nor justification) is provided in Sheehan (in press) as to the structural relation R (called 'dominate') between the copy of (interpretable/unvalued features of) X and the syntactic object $\{X, Y\}$, nor are we told how R can ensure the result that X directly c-commands Z and W in structures like $\{\{X, Y\}, \{Z, \{W, \dots\}\}\}$ (=46b)). Some stipulative complication of the definitions of labels and c-command is unavoidable. This familiar problem is by no means unique to Sheehan, but rather it is shared by most of the contemporary approaches that presume some sort of representational labels/projections, either explicitly or implicitly. I believe that this very difficulty rather strongly vindicates the theoretical move toward eliminating representational labels from the theory of syntax (see Collins 2002, Seely 2006, Chomsky 2004, 2007, 2008, Narita 2011).⁹

5 Concluding Remarks

To review, Uriagereka's (1999) claims can be summarized as follows.

- (48) a. Kayne's original LCA involves stipulative reference to labels that can be eradicated only by eliminating recourse to the induction step.
 b. $*\{XP, YP\}$ follows from the simplified LCA without the induction step.
 c. Merger of two phrases requires cyclic Transfer (noncomplement-reduction).
 d. The LCA-based H- α schema derives the CED effect.

While I fully appreciate the force of (48a), as we will see shortly, I proposed in this paper to replace (48b-d) with the following:

⁹Note incidentally that Sheehan's attempt to resuscitate the LCA by means of the copy theory of labeling is partially motivated by her desire to capture (syntactically) a generalization known as the *Final-over-Final Constraint* (FOFC) (see Biberauer et al. 2008, Sheehan 2009, 2010).

- (i) *Final-Over-Final Constraint* (FOFC) (Biberauer et al. 2008:97):
 If α is a head-initial phrase and β is a phrase immediately dominating α , then β must be head-initial.
 If α is a head-final phrase, and β is a phrase immediately dominating α , then β can be head-initial or head-final.

However, given that there exists a simple and plausible parsing-based account of the FOFC effect by Cecchetto (2007, to appear), no recourse to the LCA is necessary, contra these authors' claims.

- (49)
- a. *{XP, YP} follows from the absence of projection of lexical features in bare phrase structure.
 - b. Merger of two phrases requires cyclic Transfer (either complement-reduction or noncomplement-reduction).
 - c. The LCA-free H- α schema derives the CED effect.

It is Uriagereka (1999) who first ingeniously proposed a cyclicity-based account of Huang's (1982) CED. However, it was argued in this article that, despite Uriagereka's claim to the contrary, the model of cyclic Transfer can give a descriptively adequate account of the CED effect only when the H- α schema is dissociated from the LCA. I provided various empirical generalizations and arguments that further support an LCA-free approach to the CED effect. In a nutshell, then, a full-fledged account of the CED in terms of the H- α schema can survive only in LCA-free syntax.

This conclusion leaves us with the choice between the H- α schema in LCA-free syntax or LCA-bound syntax without the H- α schema. At this point, let us come back to Uriagereka's (1999) criticism of the original LCA (Kayne 1994), whose exposition by Uriagereka (1) is repeated here:

- (1) *The Linear Correspondence Axiom* (LCA) (Kayne 1994; rephrased by Uriagereka 1999)
- a. Base Step: If α c-commands β , then α precedes β .
 - b. Induction Step: If γ precedes β and γ dominates α , then α precedes β .

Uriagereka criticizes Kayne's version of the LCA by pointing out that only stipulations can assure asymmetric c-command relations between sister nonterminals that the induction step of the LCA requires. Reference to labels/nonterminals has been the major form of stipulation to this effect, be it the category-segment distinction among nonterminals as in Kayne (1994), or the invisibility of nonminimal-nonmaximal projections as in Chomsky (1995). Then, Kayne's version of the LCA is bound to be a departure from the SMT (as correctly pointed out by Chomsky 2004:110 among others), to the extent that reference to labels/nonterminals is so.

In fact, Kayne himself seems to be in agreement with this criticism. Thus, *pace* Sheehan, he notes in his 2009 paper, "Full integration of the LCA with bare phrase structure will require reformulating the LCA without recourse to non-terminals." (Kayne 2009:note 8) I suspect that this problem eventually convinced him to decide to dispense with the LCA in his account of antisymmetry in Kayne (2010), as we will review shortly.

Recall also that Uriagereka's attempt to revamp the LCA is motivated as a way to overcome stipulative reference to labels/projections inherent to Kayne's original LCA. In this light, Sheehan's unsuccessful attempt to resuscitate Uriagereka's simplified LCA by adding another set of stipulations on labels is plainly putting things backward. Uriagereka's solution was to eliminate its induction step (1b) and let Transfer 'atomize' phases to simplex LIs, an idea that my proposal fundamentally shares with Uriagereka. What Uriagereka got wrong is just that he erroneously attempts to incorporate his theory of cyclic Spell-Out/Transfer into LCA-bound syntax, a failure that we successfully overcame by exploring alternative LCA-free deductions of the H- α schema (Narita 2011, forthcoming). To the extent that Uriagereka is right in pointing out that the elimination of the induction step is necessary to sever the LCA from reference to labels, we can draw a much stronger conclusion, which is that the LCA has in fact no place in projection-free syntax. Rather, the discussion in this article is pointing to the conclusion that the theory of bare phrase structure can also pursue 'bare', projection-free syntax, if (and, presumably, only if) it is dissociated from the LCA. Both empirical coverage and theory-internal simplicity achieved by projection-free syntax are urging us to explore it, and therefore, LCA-

free syntax.

In a nutshell, the conclusion is that the LCA is an unsustainable hypothesis as a minimal theory of phonological linearization. This leaves us with the question of *why* the LCA must be wrong, *i.e.*, why the FL is designed in such a way that it can never accommodate the LCA as a possible principle of linearization. This question may be still pressing, given that the rather remarkable number of advocates in the field suggests that, despite its descriptive inadequacy discussed in this article as well as in Fukui and Takano (1998), Ackema and Neeleman (2002), Richards (2004), Abels and Neeleman (2009) and Narita (2010), the LCA seems to still strike many researchers as appealing to some extent. Importantly, Uriagereka's criticism again provides a necessary component of the principled answer to this question: no stipulation involving labels/projections should be available in minimal syntax, and therefore, the LCA is plainly unformulable.

This is a strong argument against Kayne's original LCA, as well as Sheehan's, but it still leaves us with Uriagereka's simplified LCA, which makes little recourse to labeling/projection. To make sense of the unavailability of Uriagereka's LCA, it should be noted that reference to asymmetric c-command relations still constitutes a necessary component of Uriagereka's LCA. However, whether (asymmetric) c-command is available as a relation in syntax is questionable. In fact, Chomsky (2008:141) suggests that it is a dispensable notion, and that various considerations that used to build on c-command, such as Agree and also some aspects of binding, can be either reduced to probe-goal search or attributed to some post-syntactic/semantic factors. Plausibly, then, the notion of 'c-command' is reduced to just an informal cover term to refer to a certain structural configuration, admitting of no real theoretical significance in syntax. This might provide an answer to the question why the LCA fails: there is no notion of c-command, and therefore the LCA is unavailable.

Moreover, I would also like to point out that there is another ground for the hypothesis that asymmetric c-command cannot figure in the theory of linearization. Recall that the H- α schema generates unidirectional H- α branching of the form $\{X, \{Y, \{Z, \dots\}\}\}$. Importantly, it should always be the case that the most deeply embedded constituent in such a branching structure should assume a structure of the form $\{X, Y\}$, where both X and Y are LIs. X and Y c-command each other, so there is no asymmetric c-command available for this structure to be linearized in terms of any version of the LCA. More generally, any structure building in the framework of bare phrase structure should start by merging two LIs. Indeed, symmetric structures of the form $\{X, Y\}$ are bound to be generated in each phase, and hence, LIs in each phase cannot be exhaustively characterized in terms of asymmetric c-command.¹⁰

To conclude, I argue that the following three premises are sufficient to exclude the LCA on principled grounds: there is no relation of c-command available in syntax; symmetric SOs of the form $\{X, Y\}$ are unavoidably generated; and, most importantly, syntax assumes no labels/projections.

Finally, let me briefly remark on Kayne (2010). Kayne (1994, 2004, 2010) is consistent in assuming that syntax is antisymmetric, *i.e.*, that there is a universal word order template, Spec-Head-Complement. However, admitting the inherent incompatibility between bare phrase structure and the LCA (see Kayne 2009:note 8 quoted above) Kayne (2010) decided to sever his

¹⁰Guimarães (2000) and Kayne (2009) suggest that one option for Merge is the direct formation of a singleton set $\{X\}$, and that the singleton-formation can be reasonably adopted for the purpose of exorcising symmetric $\{X, Y\}$ structures: thus, $\{\{X\}, Y\}$ or $\{X, \{Y\}\}$ is sufficiently asymmetrical to ensure asymmetric c-command between X and Y. Although this might technically save the mechanism of LCA-based linearization, further stipulations are necessary to ensure that all instances of merger of two LIs are mediated by the singleton-set formation. See Kayne (2009) for some relevant discussion. See also Fukui (2011) for a different approach to symmetric structures.

idea of antisymmetry from the LCA. Indeed, what he attempts in his 2010 paper is to “transpose the LCA-based ideas into the more derivational framework of Chomsky (1995) and later work,” pursuing an alternative, LCA-free theory of antisymmetry.

Kayne’s (2010) p-merge-based theory of antisymmetry can be summarized as follows:

- (50)
- a. Merge applying to α and β creates not a set of α and β ($\{\alpha, \beta\}$) but rather an ordered pair of α and β , $\langle\alpha, \beta\rangle$, specifying that α immediately precedes β . (Kayne calls his conception of Merge *p-merge*, to differentiate it from Chomsky’s set-Merge and also from his pair-Merge; see Chomsky 2004, 2007, 2008).
 - b. Head and complement are invariably merged as $\langle H, C\rangle$.
 - c. The merger of two phrases is unavailable ($= *\{XP, YP\}$).
 - d. Due to (50c), the specifier phrase S is not p-merged with $\langle H, C\rangle$ but with H itself, invariably resulting in $\langle S, H\rangle$.

First of all, Kayne departs from the standard theory of bare phrase structure and claims that Merge should create not just sets but ordered pairs (50a). Building on some parsing-based considerations, he maintains that the merger of H and C invariably results in $\langle H, C\rangle$ (50b). Interestingly, he then puts forward the hypothesis in (50c), basically identical with $*\{XP, YP\}$ (4), essentially in order to make sense of his idea in (50d). He assumes that the immediate precedence relation captured by p-merge is total: if X immediately precedes Z and Y immediately precedes Z then $X = Y$, and also if Z immediately precedes X and Z immediately precedes Y, then $X = Y$. Then, it follows that an LI H can be p-merged with at most two distinct elements, one to its right and the other to its left, and also that if H p-merges with X and also p-merges with Y, then X and Y must be on opposite sides of H in terms of immediate precedence. Thanks to (50b), then S is always p-merged to the left of H, yielding $\langle S, H\rangle$. The ‘discontinuous’ constituents $\langle H, C\rangle$ and $\langle S, H\rangle$, however non-canonical they may look, determine the universal S-H-C word order, deriving antisymmetry.

Kayne’s p-merge-based account of antisymmetry makes no recourse to c-command or labels, while it can accommodate most of the empirical predictions attributed to the LCA. That much is compatible with my conclusion established in this article and in Narita (2011), namely that there should be no reference to labeling/projection in the minimal theory of syntax. It is interesting to observe that he ended up proposing a kind of H- α schema (51) as a way to eliminate recourse to labels and nonterminals.

- (51) *Kayne’s (LCA-free but still antisymmetric) H- α schema* (Kayne 2010):
 Each application of Merge takes an LI as its input, yielding $\langle H, \alpha\rangle$ or $\langle \alpha, H\rangle$ where H is an LI and α an SO.

However, the cost of his p-merge hypothesis is that it necessarily incorporates precedence into the core of narrow syntax. See Chomsky (1995), Berwick and Chomsky (2008), Narita (2011) among others for argument against the idea that linear order is an operative notion in syntactic computation.

Noticeably, Kayne has no intention of defending his theory of antisymmetry on the basis of the CED effect. Therefore, unlike Uriagereka’s and Sheehan’s approaches, Kayne’s theory does not claim any connection between the effect of the CED and cyclic derivation by phase. It thus departs from the arguably minimal theory of the CED, which I claimed is simply deducible from $*\{XP, YP\}$, or more generally from the absence of projection in syntax (note that Kayne anyway needs to assume $*\{XP, YP\}$ independently). Therefore, Kayne’s p-merge based theory is by and large orthogonal to, if not totally incompatible with, the present exploration of the

minimal theory of phase cycles. This leaves us with the choice between Kayne's antisymmetric H- α schema with p-merge structures and Narita's non-antisymmetric H- α schema with simpler set-Merge and the minimal account of the CED, and of course yet many other theories of bare phrase structure. Only future research can show which approach achieves the best set of results in terms of coverage of the data and simplicity of the theory. See Narita (2011:chapter 4) for some preliminary exploration of the mechanism of linearization that basically incorporates the effect of directionality parameters in the theory of syntax without XP-YP structures. See also his chapter 5 for further exploration of the effect of the (LCA-free) H- α schema on the endocentricity/headedness of phrase structure.

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