Where is Label(ing)?*

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1 Questions To Be Addressed

★ Where is label(ing)?
- Q1: Does label(ing) exist, really?
- Q2: What is it that exists as label(ing)?
- Q3: Why is it that there is any such thing as label(ing)?
- Q4: Which elements within a given syntactic object (SO) contribute to labeling, and which don't?
- Q5: Which constituents of a given SO are labeled, and which aren't?

2 Chomsky's Labeling Algorithms (CLA)

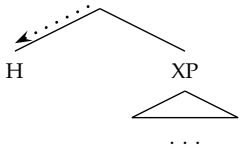
2.1 Chomsky's Answers to Q1–Q5

★ Chomsky (2013, 2015):
- A1: Yes, labeling exists, but not in the form of projection.
- A2: Labeling just is a minimal search procedure applying at Transfer.
- A3: (i) "For a syntactic object SO to be interpreted, some information is necessary about it: what kind of object is it? Labeling is the process of providing that information." (Chomsky 2013:43)
  (ii) Therefore, "Labeling has to be done, for the same reason that Merge has to be done. Otherwise there is nothing to interpret." (Chomsky et al. 2015:80)
- A4: Elements may or may not be visible for labeling. C, D, v*, etc., are visible, while T, $\sqrt{root}$, traces of Internal Merge (IM), and pair-Merged elements are invisible for labeling.
- A5: Every constituent within an SO has to be labeled.

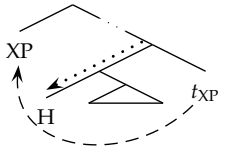
2.2 Assumptions from *POP* (Chomsky 2013)

(1) ***Labeling as a Necessary Condition for Interpretation***:
Every SO has to be labeled via the following labeling algorithms (henceforth CLA for short). Otherwise, it cannot receive interpretation, hence excluded by the principle of Full Interpretation.

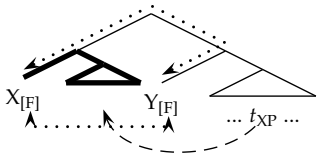
(2) *Minimal Search of Head*:
For each SO Σ, define the most prominent lexical element within Σ as the label of Σ.



(3) *Trace Invisibility*:
If α in $\{\alpha, \beta\}$ undergoes Internal Merge (IM) (or affixation via pair-Merge; see (7)), the label of β becomes the label of $\{t_\alpha, \beta\}$.



(4) *Labeling by Agreement Features*:
For an SO {XP, YP}, with XP and YP both phrasal, if XP and YP share the agreement feature F as their most prominent lexical element, then {XP, YP} is labeled <F, F>.



2.3 Additional Assumptions from *POP*+ (Chomsky 2015)

(5) *Weakness of* $\sqrt{root}$ (Chomsky 2015):
$\sqrt{root}$ is too weak to define a label.

(6) *Weakness of T* (Chomsky 2015):
T is too weak to define a label (parametrized? See Goto 2017).

(7) *pair-Merge of C/v* to T/*$\sqrt{root}$ (Chomsky 2015):
C/v* is pair-Merged to T/$\sqrt{root}$. As a result, C/v* becomes invisible and T/$\sqrt{root}$ becomes visible for CLA.

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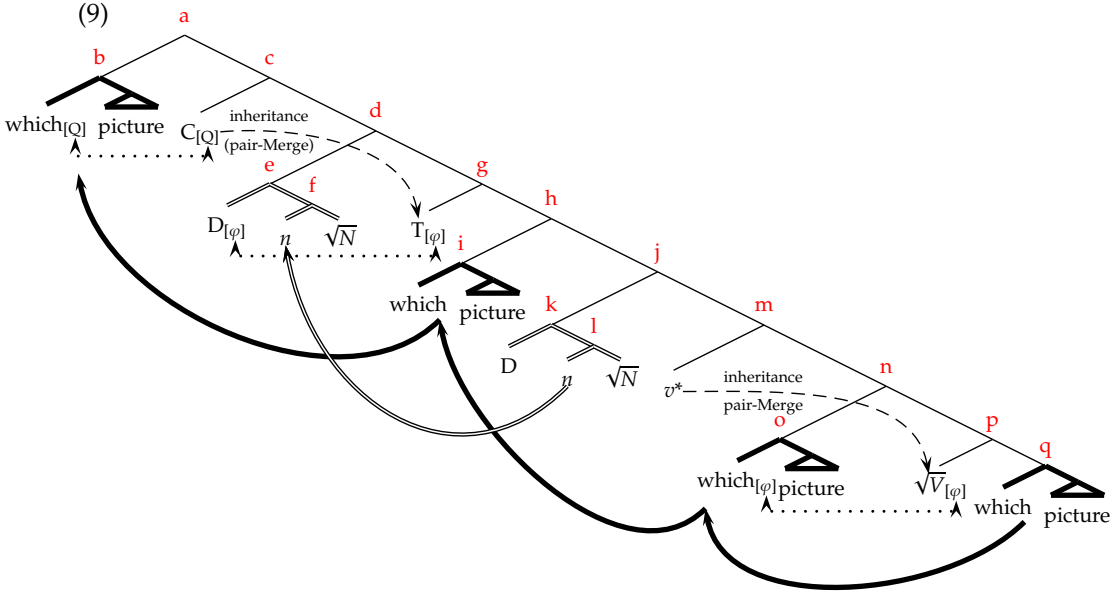
2.4 Some Illustration

(8) Which picture did the man buy?

(9)



2.5 Advantages of CLA

★ **Advantage 1:**
CLA is intended to keep to what is conceptually necessary (Merge and interpretation).

★ **Advantage 2:**
CLA aims at "taming" otherwise unconstrained Merge, which may quite easily lead to massive overgeneration. In particular, it is claimed to derive empirical results like (10)-(13).

(10) "Local Instability" effect (Chomsky 2008, Ott 2012, 2015):
{XP, YP} is unstable, unless XP and YP agree.

(11) "Criterion" effect (Rizzi 2006, 2007):
Once XP undergoes movement, it must keep moving successive-cyclically into the "criterial position," whose mother SO can be labeled <F, F>.

(12) "EPP" effect:
In languages like English, due to the weakness of T, {T, XP} must be merged with a φ-bearing SO YP, forming {$YP_{[\varphi]}$, {$T_{[\varphi]}$, XP}} to be labeled <φ, φ>.

(13) "ECP" effect (or the "Criterial Freezing" effect more generally):
In languages like English, IM of YP out of {$YP_{[\varphi]}$, {$T_{[\varphi]}$, XP}} is prohibited, because it leads to cancellation of the <φ, φ>-label of {$t_{YP[\varphi]}$, {$T_{[\varphi]}$, XP}}, with T too weak to serve as an independent label.

2.6 Disadvantages of CLA

(See also Richards 2017)

2.6.1 CLA ≠ Minimal Search for Interpretation

★ **Disadvantage 1**:
CLA departs from the Optimal Thesis in (14):

(14) ***Optimal Thesis*** (Narita 2014):
Labeling reduces to the minimally required inspection of LIs and their features relevant for interpretation at SEM/PHON.

▹ To me, this seems to be the only way to make sense of (1).

(15) Stipulations of weakness/invisibility of T/$\sqrt{root}$ in (5) and (6)

▹ Necessary to salvage {categorizer, $\sqrt{root}$} from CLA-unlabelability.

▹ However, T and $\sqrt{root}$ clearly have rich interpretive content, and no doubt visible for search by CI-interpretive processes.

(16) Apparent unlabelability of {T/$\sqrt{root}$, XP} (see Dobashi 2017a,b)[1]

▹ Rescued only by recourse to pair-Merge and invisibility of its trace in (7)

(17) Extensions of pair-Merge as in (7) have no principled ground.

▹ Shouldn't we say that C and v* receive interpretation, irrespective of whether they undergo pair-Merge or not?

★ Stipulating that T, $\sqrt{root}$, and pair-Merge traces are invisible to CLA effectively disambiguates that CLA is not equal to search for interpretation.

[1] Dobashi (2017a,b) proposes a slight modification of the principle of Full Interpretation, according to which each SO must be interpretable either at SEM-interpretation or in PHON-externalization. He calls this modified version "Disjunctive Full Interpretation." He argues that {T/$\sqrt{root}$, XP} is generally not SEM-interpretable due to CLA-unlabelability, and that it is therefore required by Disjunctive Full Interpretation to contribute to PHON-externalization, specifically by feeding phonological phrasing. Exploration of this interesting possibility is left for future research.

2.6.2 Universal Labeling is Empirically Untenable

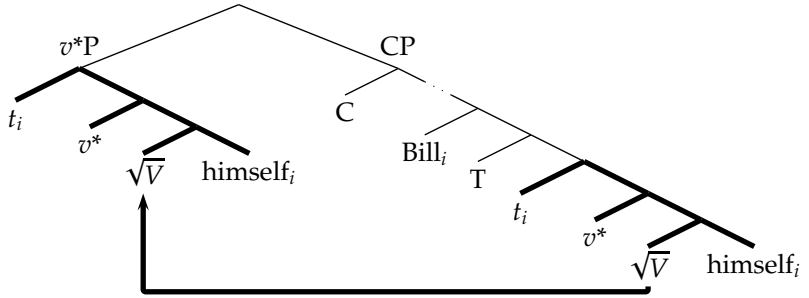
⋆ **Disadvantage 2**:
Even putting all these matters aside, there are numerous cases where CLA apparently fails to assign labels.

⋆ Case 1: Predicate fronting

(18) a. [$_{v^*P}$ Criticize himself$_{i/*j}$], John$_j$ thought Bill$_i$ really did t_{vP}.
b. [$_{AP}$ Proud of himself$_{i/*j}$], John$_j$ doesn't think Bill$_i$ will ever be t_{AP}.

(19) Adopting the predicate-internal subject hypothesis (Koopman and Sportiche 1983, Fukui 1986/1995, Sportiche 1988, Kuroda 1988, Huang 1993; see also Chomsky 2012), the underlying structure for predicate-fronting, e.g., (18a), can be represented as (20).[2]

(20)



(21) CP is labeled C, and C is of depth 2 in (20). Turning to vP in Spec-C, however, there is no LI of depth 2 within v*P, so C's features can never find an equally prominent counterpart in v*P within (20).

(22) Trace invisibility (3) does not help, either, because v* and C do not share any matching feature.

(23) Advocates of CLA may think there is an easy way out of this problem. Thus, it is possible to stipulate that there exist some agreement features [X] (say [Top(ic)] or [Foc(us)]) on v* and C that undergo agreement, hence capable of labeling (20).

(24) However, this assumption is not only *ad hoc*, but it also necessarily invites many empirical problems that seems unresolvable.

(25) For example, how is the distribution of [X] constrained? It cannot be that it is freely inserted anywhere anytime, since this additional stipulation would lead to massive overgeneration.]

[2]The existence of a predicate-internal trace/copy of the subject is evidenced by, e.g., the impossibility of anaphor-binding into the dislocated predicate (as in (18a), (18b)). See Huang (1993), Narita (2015) for a relevant argument. Heycock (1995) among others proposes an alternative analysis that does not assume predicate-internal subject traces, but even with Heycock's analysis, the unlabelability problem discussed here stays intact, due to trace-invisibility (3).

(26) In fact, [X] makes *any* movement (or non-movement) CLA-labelable, such as "halfway" successive-cyclic *wh*-movement (27), agreement-less subjects (28), topicalization of raising/ECM infinitivals (29), and so on.

(27) "halfway" successive-cyclic *wh*-movement:
a. *You believed [who$_{[X]i}$ that/$\oslash_{[X]}$ John criticized t_i].
b. *Did you believe [who$_{[X]i}$ that/$\oslash_{[X]}$ John criticized t_i]?

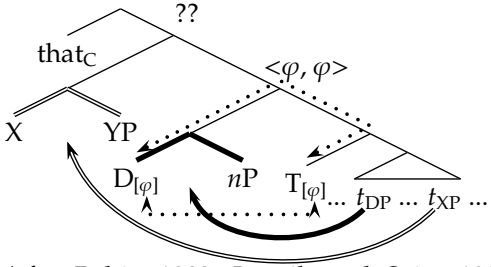
(28) agreement-less subjects:
a. *[me$_{[X]}$ is$_{[X]}$ a student of physics].
b. *[he$_{[X]}$ play$_{[X]}$ the guitar].

(29) topicalization of raising/ECM infinitivals:
a. *[to$_{[X]}$ t_j be ill]$_i$, C$_{[X]}$ John$_j$ seems t_i.
b. *[to$_{[X]}$ t_j be ill]$_i$, C$_{[X]}$ I believe John$_j$ t_i.

⋆ Case 2: Embedded Topicalization

(30) a. John believes that *this book*$_i$, Mary wrote t_i.
b. John wonders if/whether *this book*$_i$, Mary wrote t_i.

(31)



(cf. Baltin 1982, Lasnik and Saito 1992, Maki and Kaiser 1998, Maki et al. 1999)

(32) Stipulating an independent C within *that*-CP may circumvent the unlabelability problem (Authier 1992, etc.), but introduce various other problems, including the one with [X]-features discussed above.

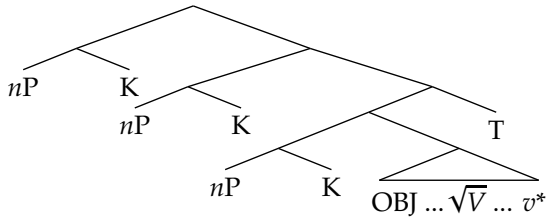
⋆ Case 3: Multiple Subject Constructions

(33) *Japanese*: Multiple Subject (see Kuno 1973)

Bunmeikoku-ga zyosei-ga heikinzyumyoo-ga dondon
civilized.countries-NOM female-NOM average.lifespan-NOM more.and.more
nagaku natteiru.
longer become

'As for civilized countries, speaking of women, their average lifespan becomes longer and longer.'

(34)

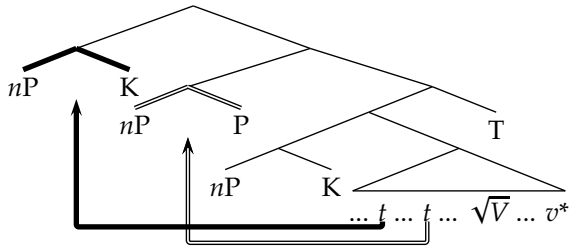


⋆ Case 4: Multiple Scrambling

(35) *Japanese*: Scrambling

a. John-ga airmail-de Mary-ni sono hon-o okutta.
John-NOM airmail-by Mary-DAT that book-ACC sent
'John sent that book to Mary by airmail.'
b. *airmail-de*$_i$ John-ga t_i Mary-ni sono hon-o okutta.
c. *Mary-ni*$_i$ John-ga airmail-de t_i sono hon-o okutta.
d. *sono hon-o*$_i$ John-ga airmail-de Mary-ni t_i okutta.
e. *airmail-de*$_i$ *Mary-ni*$_j$ John-ga t_i t_j sono hon-o okutta.
f. *airmail-de*$_i$ *sono hon-o*$_j$ John-ga t_i Mary-ni t_j okutta.
g. *Mary-ni*$_i$ *sono hon-o*$_j$ John-ga airmail-de t_i t_j okutta.
h. *airmail-de*$_i$ *Mary-ni*$_j$ *sono hon-o*$_k$ John-ga t_i t_j t_k okutta.
i. *sono hon-o*$_i$ *airmail-de*$_j$ *Mary-ni*$_k$ John-ga t_j t_k t_i okutta.
j. *Mary-ni*$_i$ *sono hon-o*$_j$ *airmail-de*$_k$ John-ga t_k t_i t_j okutta.

(36)



(37) Japanese syntax lacks φ-features, hence never defines <φ, φ>-labeling (Fukui 1986/1995, 2006, Kuroda 1988).

(38) Saito (2014, 2016) and Sorida (2017a,b) hypothesize that Case (K) in Japanese is an exceptional category that makes KP invisible to CLA. This idea may salvage the unlabelability problems in Case 2 and Case 3, but it is ineffective in accounting for K-less languages.

⋆ Case 5: Prefield in German V2

(39) In German, declarative root(-like) contexts at least and at most one XP must occupy the position before the finite verb (V2 realized at C) (see Emonds 2004, 2012 and Blümel 2017 for recent accounts).

(40)
a. "promiscuity" of the prefield: a phrase of any category
b. obligatoriness: at least one phrase
c. uniqueness: at most one phrase

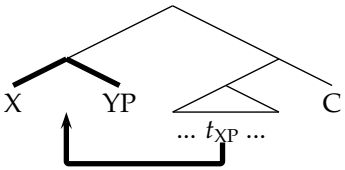
(41) *German*:

a. [$_{DP}$ Maria] hat t_{DP} den Mann gestern gesehen
Mary has the man yesterday seen
'Mary has seen the man yesterday.'
b. [$_{AdvP}$ gestern] hat Maria den Mann t_{AdvP} gesehen
yesterday has Mary the man seen
c. [$_{vP}$ den Mann gesehen] hat Maria gestern t_{vP}
the man seen has Mary yesterday
d. [$_{CP+fin}$ dass die Sonne scheint] hat Maria t_{CP} gesagt
that the sun shines has Mary said
'That the sun shines, Mary said.'
e. [$_{CP-fin}$ die Scheibe einzuschlagen] hat Maria t_{CP} beschlossen
the window to-crush has Mary decided
'Mary decided to crush the window.'
f. [$_{PP}$ über den Wolken] muss die Freiheit t_{PP} wohl grenzenlos sein
above the clouds must the freedom PTCL limitless be
'Freedom must be limitless above the clouds.'
g. [$_{AP}$ schön] ist Maria t_{AP}
beautiful is Mary
'Mary is beautiful.'

(42) * Der Jens der Maria hat ein Buch geschenkt.
the Jens the Mary hans a book given

(43) Blümel's (2017) hypothesis:
Declarative root clauses must remain labelless, and prefield-occupation in V2-languages is one strategy to ensure this.

(44)



3 An Alternative: Narita and Fukui's (forthcoming) Symmetry-driven Syntax

3.1 Keeping to the Optimal Thesis

⋆ **Proposal 1**:

Keeping to the Optimal Thesis (45) (rephrased), we eliminate the notion of universal labeling in the sense of Chomsky (2013, 2015).

(45) ***Optimal Thesis*** (rephrased):
There is no such thing as labeling algorithms, apart from the minimally required inspection of LIs and their features relevant for interpretation at SEM/PHON.

(46) Correspondingly, there is no such thing as "unlabelable SOs": every SO receive interpretation via inspection of its internal elements, in full conformity with Full Interpretation (cf. the principle of strict compositionality).

(47) T, $\sqrt{root}$, traces of IM and pair-Merge, etc., are all interpretable.

(48) This approach overcomes Disadvantage 1 and 2 of CLA.

3.2 Taming Unconstrained Merge by Symmetry

★ **Proposal 2**:
Effects of Local instability, Criteria, EPP, ECP (Advantage 2) all follow from the following legibility condition on Transfer-domains.

(49) ***Phase Symmetry Condition*** (***PSC***):
Only symmetric SOs can define Transfer-domains ("phase-interior" in Chomsky's terms).

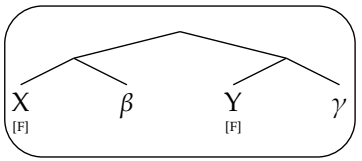
(50) ***Symmetry*** ("intrinsic uniformity" in Narita and Fukui's (forthcoming) terms):
An SO $\Sigma = \{\alpha, \beta\}$ is *symmetric* $=_{def.}$ For the generative procedure GP that yields Σ, all the properties and relations assigned by GP equally hold of α and β, i.e., no property P or relation R assigned by GP makes α distinct from β, and vice versa.

3.2.1 Symmetry 1: Feature-equilibrium

★ The first type of symmetric structure is what Narita and Fukui (forthcoming) calls "feature-equilibrium," which roughly corresponds to <F, F>-labeled SOs.

(51) ***Feature-Equilibrium***:
An SO $\Sigma = \{\alpha, \beta\}$ is in an *F-equilibrium* $=_{def.}$ α and β share a matching feature F that is equally prominent within Σ, and there exists no feature G such that (i) G ≠ F, and (ii) G is asymmetrically involved in Σ.

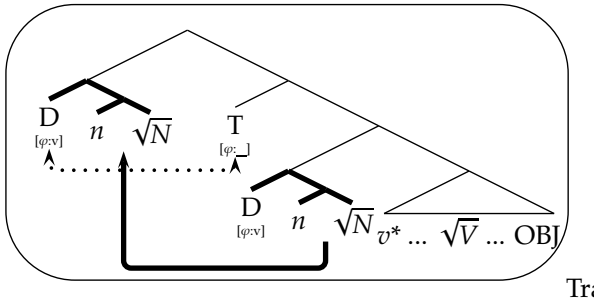
(52)



⟼ Transfer possible

(53) [$_\alpha$ the man] will$_T$ t_α read the book.

(54)

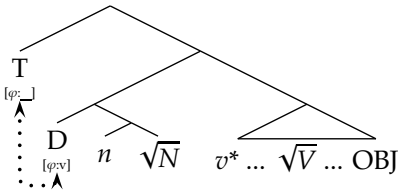


⟼ Transfer possible

★ Non-movement of the subject DP results in an asymmetric and hence untransferrable SO.

(55) * will$_T$ [$_\alpha$ the$_D$ man] read the book. (as a declarative sentence)

(56) *

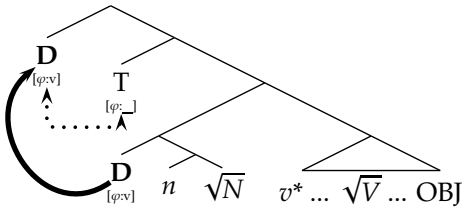


★ Local instability effects (10) and criterion effects (11) follow from the instability of asymmetrically distributed features.

★ Further, the moving SO should be of the right size. Illegitimate pied-piping yields asymmetric SOs, precluding Transfer.

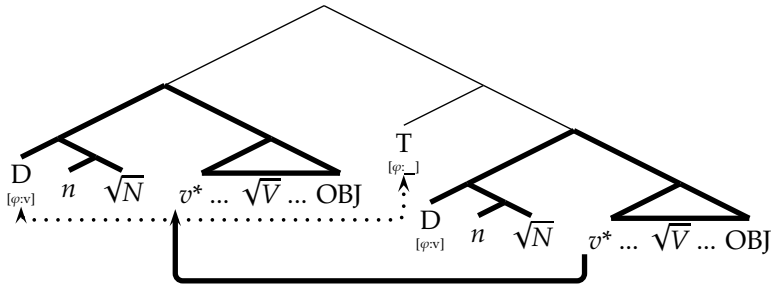
(57) * [$_D$ the]$_i$ will$_T$ [$_\alpha$ t_i man] read the book.

(58) *



(59) * [$_\beta$ [$_\alpha$ the$_D$ man] read the book] will$_T$ t_β.

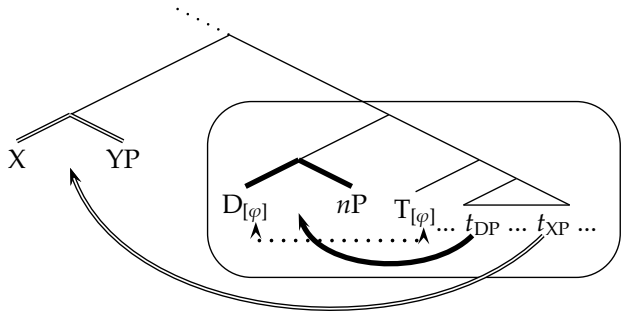
(60) *



★ Feature-equilibrium may undergo further Merge without any problem, accounting for cases like embedded topicalization (Case 2).

(61) a. John believes that *this book*$_i$, Mary wrote t_i.
b. John wonders if/whether *this book*$_i$, Mary wrote t_i.

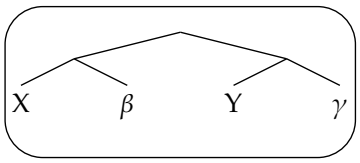
(62)



(63) (cf. Lasnik and Saito 1992, Maki and Kaiser 1998)
a. The robot$_i$ thinks that *itself*$_i$, Mary likes t_i.
b. *The robot$_i$ thinks that itself$_i$ t_i likes Mary.

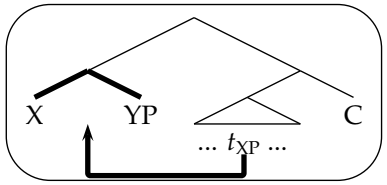
3.2.2 *Symmetry 2: {XP, YP} without any remaining features*

(64)



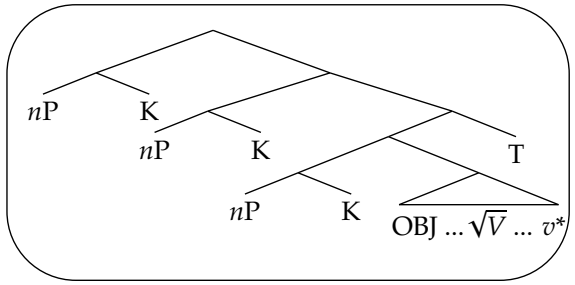
⟼ Transfer possible

(65) Predicate fronting (Case 1), German V2 (Case 5): (= (44))



⟼ symmetric, Transfer possible

(66) φ-less {KP, XP} in Japanese (Case 3, 4):



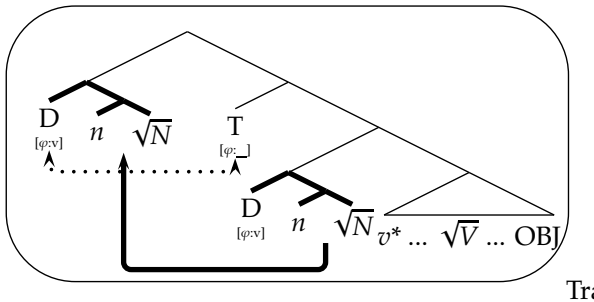
3.2.3 *Discontinuity of Internally Merged Objects and Criterial Freezing*

★ Suppose Chomsky (2013) is right in assuming that IM/movement of an SO α renders α part of a discontinuous object ("chain" in earlier terms).

(67) "If, say, XP raises, then the result will be the structure [XP copula {$_\beta$ XP, YP}], with two copies of XP. The intuitive idea is that the lower XP copy is invisible to LA, since it is part of a discontinuous element, so therefore β will receive the label of YP. The phenomenon is similar to intervention effects, where the head of a chain (more appropriately, the whole chain, the discontinuous element) induces an intervention effect, but not the lower copy. [note 32 omitted]
The standard convention has been to take each of the copies to be an independent element. Adopting that convention, it may seem to be a stipulation to take the whole chain to be the relevant SO. But the convention has no particular merit. It is quite reasonable to take α to be "in the domain D" if and only if every occurrence of α is a term of D. [note 33 omitted] That yields the intended results for intervention and for the labeling interpretation of dynamic antisymmetry." (Chomsky 2013:44)

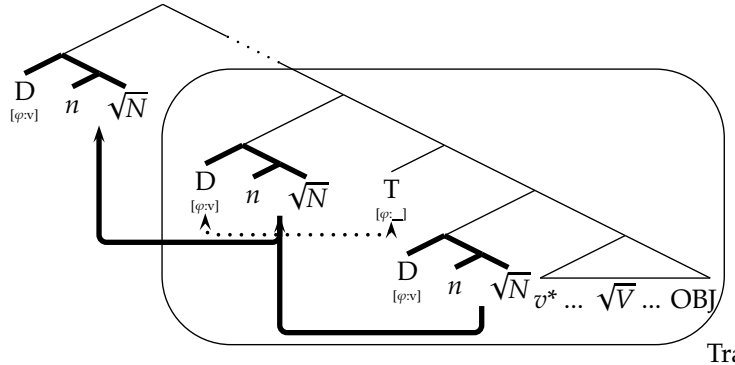
★ Then, it follows that {t_α, β}, t_α being a copy of α created by IM, is not a symmetric object, since one of the two constituents is part of a discontinuous element.

(68)



⟼ Transfer possible

(69) *



⟼ Transfer impossible

(70) Effects of ECP and Criterial Freezing follow from the asymmetry of {$XP_{[discontinuous]}$, YP}.

4 Conclusion

- ⋆ Where is label(ing)?
  - Q1: Does label(ing) exist, really?
  - Q2: What is it that exists as label(ing)?
  - Q3: Why is it that there is any such thing as label(ing)?
  - Q4: Which elements within a given syntactic object (SO) contribute to labeling, and which don't?
  - Q5: Which constituents of a given SO are labeled, and which aren't?
- ⋆ Chomsky (2013, 2015):
  - A1: Yes, labeling exists, but not in the form of projection.
  - A2: Labeling just is a minimal search procedure applying at Transfer.
  - A3: (i) "For a syntactic object SO to be interpreted, some information is necessary about it: what kind of object is it? Labeling is the process of providing that information." (Chomsky 2013:43)
    (ii) Therefore, "Labeling has to be done, for the same reason that Merge has to be done. Otherwise there is nothing to interpret." (Chomsky et al. 2015:80)
  - A4: Elements may or may not be visible for labeling. C, D, v*, etc., are visible, while T, $\sqrt{root}$, traces of Internal Merge (IM), and pair-Merged elements are invisible for labeling.
  - A5: Every constituent within an SO has to be labeled.
- ⋆ Narita and Fukui (forthcoming):
  - A1: No, there is no such thing as labeling algorithms, apart from the minimally required inspection of LIs and their features relevant for interpretation at SEM/PHON (= Optimal Thesis, (45)).
  - A2: = A1.
  - A3: Inspection of LIs and their features has to be done, for the same reason that Merge has to be done. Otherwise there is nothing to interpret. (cf. Chomsky et al. 2015:80)
  - A4: Every element within a given SO is subject to inspection by the mappings to SEM/PHON
  - A5: Nothing is labeled. Everything receives interpretation via inspection.
- ⋆ We argued that the notion of symmetry in syntax can derive empirical advantages of CLA while overcoming its difficulties.

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