De-Phasing Effect: External Pair-Merge of phase head and non-phase head

Yushi Sugimoto/ Sophia University
yst201q.x@gmail.com

Synopsis: In the minimalist program for linguistic theory, the only fundamental operation is unbounded (**set**-)Merge. Chomsky (2004) argues that internal (set-)Merge comes free as well as external (set-)Merge, and suggests that there is an operation of **pair**-Merge that is a descendant of Adjunction. Therefore, there are four possible sub-types of Merge operation. This paper seeks for the possibility of the existence of external pair-Merge of C to T(**<T, C>**) and its consequences.

Issues: Chomsky (2004, 2005, 2008) argues that some mechanism is necessary for capturing a fundamental property of human language, which is discrete infinity. To meet this requirement, Merge should come free and it is applied either externally or internally (Chomsky 2004). In addition to set-Merge, pair-Merge is introduced as an empirical requirement, which is different from set-Merge in that it creates ordered sets as opposed to set-Merge that creates unordered sets. As a consequence, it is natural to think that there are external/internal set-Merge and external/internal pair-Merge. Moreover, Epstein, Kitahara and Seely (2016, henceforth **EKS**) argue that "in the absence of some stipulation preventing it, it [pair-Merge] can apply in two ways: internally and externally." Namely, a null hypothesis is that the rule applications of the four sub-types of Merge are 'freely ordered'. The relevant examples discussed in Chomsky (2015) are the derivation of ECM case in (1) and the derivation of bridge verb case in (2).

(1) a. He expects John to win. b. {<R, *v**>, {$_{\alpha=<\varphi, \varphi>}$ DP$_i$, {R, {$_{\beta}$ t$_i$ …}}}}

(2) a. John thinks that he is intelligent. b. {<R, *v**>, {$_{\varepsilon=?}$ {$_{\delta}$, {R, {$_{\delta}$ C, …}}}}}

c. {<R, *v**>, {$_{\varepsilon}$ R, {$_{\delta}$ C, …}}} d. {<R, *v**>, {C, …}}

It is assumed in Chomsky (2015) that there is labeling algorithm (**LA**) that executes minimal search to determine the label of syntactic objects (**SOs**). The order of operations in (1b) are as follows: (i) external set-Merge of root(**R**) to its complement, (ii) internal set-Merge of DP, (iii) external set-Merge of *v** to α, reaching phase level, and feature inheritance of *v** to R occurs, (iv) α is labeled by <φ, φ>, (v) R is raising to *v** and *v** is affixed to R so that *v** becomes invisible, and phasehood of *v** is activated at the copy of the R, (vi) transferring of β. Thus, the point in this case is that the copy of the root is visible as phasehood. The case of (2) is the bridge verbs case. If the complement of R(*think*) is raised to specifier of R (*think*) in (2b), there is no relevant features with R(*think*) and SO δ, resulting labeling failure of ε. If the SO δ does not move to specifier of R(*think*) in (2c), the copy of the root is invisible so that the label of the *ε* is the label of δ, which is C. However, EKS (2016) argue that the (in)visibility of the copy of the root in Chomsky (2015) is paradoxical because it is visible for minimal search in the case of ECM/ transitive verbs but invisible for minimal search in the case of bridge verbs. To solve this paradoxical situation, EKS (2016) propose that Merge, including set-/pair-Merge, can apply freely. In the case of bridge verbs, they propose the following order of operations in (2d): (i) external pair-Merge of *v** to R (*think*), (ii) external set-Merge of <R, *v**> to δ (the complement of R). There is no copy of the root so that there is no problem of (in)visibility of root without adding any stipulation.

Proposal: Based on the proposal in EKS (2016) that external pair-Merge can apply freely, I argue that external pair-Merge of C to T can be deduced as a null hypothesis. The consequence of external pair-Merge of phase head to non-phase head prior to feature inheritance is the property of de-phasing the phasehood of phase heads. De-phasing effect of phase heads is shown in the case of head movement in Chomsky (2015). Head movement is the operation that a higher head is affixed to a lower head by internal pair-Merge and *v** becomes invisible, which means losing its phasehood since the locus of the phases are uninterpretable features on phase heads. EKS (2016) show that external pair-Merge of *v** to R makes *v** invisible so that the phasehood of *v** are de-activated in (2). In addition, Chomsky (2004) notes that pair-Merge creates asymmetric relation between XP and YP, and the Adjunct Condition can be deduced from external pair-Merge of XP and YP (<XP, YP>). Namely, pair-Merge makes adjunct phrases invisible for probes. Therefore, I propose that external/internal pair-Merge makes the second member of the pair invisible. As a consequence, I argue that external pair-Merge of C to T de-activates the phasehood on C that becomes invisible and it is realized as infinitival marker *to* in English. As for labeling, since the amalgam of <R, *v**> serves as a label while R is too weak to serve as a label, I put forward that non-phase heads R and T is too weak to serve as a label but the amalgam of <R, *v**> and <T, C> can serve as a label if we assume the parallelism between C phases and *v** phases.

Analysis: The proposals are two fold: external pair-Merge of C to T can apply freely; and the amalgam created by external pair-Merge of C to T is the de-phased head that is realized as infinitival marker *to* in English, which serves as a label. As a consequence, we can derive

right derivations for tough-, ECM-, raising-, and control-constructions in English in a natural and simplest way in (3)-(8).

(3) a. John is easy to please.
b. {C, {John$_i$, {T, {t$_i$, {easy, {PRO$_{arb}$, {$_\beta$ **<T, C>**, {$_\alpha$ **< R, *v**>**, t$_i$}}}}}}}}}

(4) a. *John$_i$ seems that Bill likes t$_i$.
b. {C, {John$_i$, {T, {seems {t'$_i$ {that(C), {Bill, {likes t$_i$ }}}}}}}}

(5) a. I expected John to win. b. {$_{CP}$ …,{<R, *v**>, {John$_i$, {R, {t$_i$, **<T, C>**, …}}}}}

(6) a. John seems to be happy. b. {$_{CP}$ …,{John$_i$, {**<R, *v**>**, {t$_i$, {**<T, C>**, …}}}}}

(7) a. John hopes to leave. b. {$_{CP}$ …,{John, {**<R, *v**>**, {t$_i$, {**<T, C>**, …}}}}}

(8) a. John persuaded Harry to leave.
b.{$_{CP}$ …,{<R, *v**>, {Harry$_i$, {R, { t$_i$, {**<T, C>**, …}}}}}}

In (3), tough-constructions include the 'proper' improper movement. Assuming that *John* moves from object position in the embedded clause, *v**/C in the embedded clause becomes invisible for minimal search by external pair-Merge of *v**/C to R/T so that the phasehood is de-phased twice. The label of α becomes <R, *v**> and the label of β becomes <T, C>. Moreover, the unvalued Case on *John* is not valued at the embedded clause since the external pair-Merge of *v**/C to R/T makes uninterpretable features on C/*v** invisible for minimal search. Thus, *John* is possible to move freely to the matrix clause. On the other hand, the example in (4) indicates that the derivation is improper movement and the phonological content of C is realized as a complementizer *that* so that pair-Merge is impossible (Nomura 2015). Thus, it cannot de-phase the embedded clause in (4). The examples in (5)-(8) show that embedded clauses are de-phased by external pair-Merge of C to T and right derivations can be derived. The same is true for Japanese examples in (9)-(10). Hyper-Raising, which allows the subject in the embedded finite clause to move to the matrix clause in (9) and a long distance passive in (10) can also be predicted by operating external pair-Merge.

(9) a. *They$_i$ seem [that t$_i$ like Mary]. (cf. It seems that they like Mary.) (Ura 1994a: 297(1a))
b. Karera-ga$_i$ kyoo-no kaigi-de (Mary-niyotte) [t$_i$ asita kuru to] houkokus-are-ta.
They-$_{NOM}$*i* today-$_{GEN}$ meeting-at Mary–by t$_i$ tomorrow com $_{COMP}$ report-$_{PASS}$-$_{PAST}$
'Lit * They$_i$ were reported by Mary at today's meeting that t$_i$ would come tomorrow'
c.{$_{CP}$, {$_{TP}$ Karera-ga$_i$, … ,{**<R, *v**>**, …,{**<T, C>**, {t$_i$, ….}}}}

(10) a. Taroo-ga$_i$ Mary-niyotte [t$_i$ Jiroo-ni keisatsu-o yoba-re-ta to] hanas-are-ta.
Taroo-$_{NOM}$*i* Mary-by [t$_i$ Jiro-$_{DAT}$ police-$_{ACC}$ call-$_{PASS}$-$_{PAST}$ $_{COMP}$ talk-$_{PASS}$-$_{PAST}$
'Lit. * Taroo$_i$ was talked by Mary that t$_i$ was called by police by Jiroo.'
b.{$_{CP}$, {$_{TP}$Taroo$_i$, …{**<R, *v**>**, …,{**<T, C>**, t$_i$, …, }}}

In German, external pair-Merge is executed in a different way from English. *Zu* in German, like *de* in French and *di* in Italian, is realized as infinitival complementizer(Biskup 2014) and it is known that T is φ-complete and subject in the embedded clause receives null case. *Zu* is not a full complementizer but not the same as English infinitival *to*. In my analysis, the external pair-Merge is executed as **<C, T>**, that is, uninterpretable features on C are visible for minimal search. As a consequence, ECM in German is impossible with *zu* in (11b).

(11) a. Er sah ihn liegen. b. *Er sah ihn zu liegen. c.{Er, …{**<C, T>**, …ihn,…}}
He saw him lie he saw him to lie
'He saw him to lie.' (Biskup 2014)

There is a possibility that what derives language variation depends on the order of operating external/internal pair-Merge to phase heads and non-phase heads in narrow syntax.

Theoretical Implications: We also can get the desirable predication about Merge over Move principle without mentioning this principle as shown in (12)-(13).

(12) a. There seems to be a man in the room.
b.{There, {seems {$_{\alpha=<T, C>}$**<T, C>**, {be, {a man, in the room}}}}}

(13) a.*There seems a man to be in the room.
b.{There, {seems {$_{\alpha=?}$ a man, {**<T, C>**, {be, {t$_i$, in the room}}}}}}

The example in (13) shows that the label of α is not determined because of the structure {XP, YP}, which is ambiguous to be labeled by LA (Chomsky 2013, 2015). Put differently, the structure in (13b) shows that there is no relevant features between *a man* and <T, C> in α because minimal search cannot find uninterpretable features on C in <T, C>. The example of (12) shows that the label of α is <T, C> which is realized as *to*. Furthermore, there is no need to satisfy the EPP requirement because the amalgam of <T, C> is determined as the label of α in the case of (12). Namely, it is enough for <T, C> to serve as a label though it is necessary for finite T in English to satisfy EPP otherwise the labeling failure occurs. If these are tenable, the proposal that the existence of external pair-Merge of C to T is guaranteed.

Selected References:

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