How Does Head Movement Affect Ellipsis and Extraction?

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1. Introduction

Head movement (HM) has received much attention, since it is crucially different from phrase movement. In English, for instance, it is generally assumed that V-to-v HM is simply attributable to the morphological status of v, while T-to-interrogative C (C_q) largely has to do with the interpretation of questions (Chomsky 1995 et seq. among many others). Thus, it is easy to draw a conclusion that they may amount to different sorts of HM. The goal of this paper is to provide a unified analysis of these two types of HM based on Chomsky (2015) (POP+, hereafter). Especially, by showing that both T-to-C_q HM and R-to-v HM induce de-phasing, we propose that they are triggered by the “affixal status” of phase heads.

2. Core Data

To explore the questions raised above, we first focus on the difference in the possibility of extraction from an embedded clause and a matrix clause. We will argue that the difference in the extraction facts can be accounted for if i) if affixal C_q triggers de-phasing, and ii) matrix C_q’s are affixal, while embedded C_q’s are non-affixal.

As illustrated in (1a) and (2a), the object wh-phrase base-generated inside the ellipsis site can be extracted out of the ellipsis site. On the other hand, extraction of the object wh-phrase is not permitted when copula phrase ellipsis occurs in the embedded clause as in (1b) and (2b) (see Park 2017).

(1) a. What should Bill be proud of, and what¹ should John be proud of t₁?
   b. *I don’t know what Bill should be proud of, but I know what¹ John should be proud of t₁.

(2) a. What shouldn’t Bill be fond of, and what³ should he be proud of t₃?
   b. *I don’t know what Bill shouldn’t be proud of, but I know what³ he should be proud of t₃.

3. Background and Assumptions

3.1. Two Different Verbal Domain Structures

Among many proposals on the structure of copular constructions, in this paper, we assume the one suggested by Mikkelsen (2005), illustrated in (3a). In that structure, the subject is base-generated in the specifier position of the PredP, as proposed in Bowers (1993). The PredP merges with the functional head v, where the copula is generated. v_b is a subtype of unaccusative v: the difference between normal v and v_b is that the former and the latter takes VP and PredP as complement, respectively. On the other hand, in case of regular verbal domain, we assume that the VoiceP layer is interspersed between T and v_P, as shown in (3b). (see also Merchant 2013; Aelbrecht 2010, among others).

Given that the copula is elided in copular phrase ellipsis, we can say that the ellipsis site is v_bP. Merchant (2013) argues that the ellipsis site of regular VPE is the complement of Voice, namely v_P. This means that both copular phrase ellipsis and regular VPE have the same ellipsis site. Next, we assume that both copular phrase ellipsis and regular VPE is licensed by T (see Park 2017; cf. Lobeck 1995).

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¹ There are speaker variations. Ten out of thirteen native speakers of American English report that (1a) and (2a) are fully acceptable, while (1b) and (2b) are unacceptable. On the other hand, two informants report that they are all acceptable, even though (b) sentences are degraded.

3.2. De-phasing in POP+

Chomsky (2013) 

Chomsky also argues that “that-trace” effect can be explained by the labeling system as well. In (5a), the subject who moves to Spec,T (for expository purpose, classical terminologies are used) in order for β and α to be labeled. However, for who to arrive at the specifier of the matrix CQ, it must first move to the edge of the embedded CP phase (PIC).

(5) a. who do you think {C, {γ who, {β T, {α who, vP}}}phase} ‘who do you think read the book’
   b. who do you think {C, {γ who, {β T, {α who, vP}}}phase} ‘who do you think read the book’

However, once who moves, γ cannot be labeled as the shared feature, since a trace/copy of who is invisible for LA; hence, β cannot be labeled since weak T alone cannot serve as a label. To avoid this problem, POP+ introduces de-phasing. He argues that “feature transmission” may also inherit the phase- hood of a phase-head to its complement, and when the phase-head becomes invisible in the NS (via some independent operation), the inherited phasehood of the complement is activated. By adopting de-phasing, (5b) can be explained as follows: ‘that’-deletion in (5b) is a phase-head C deletion which occurs in the NS. As a result, T becomes a phase-head. By adopting the idea that a label determined at the previous phase is preserved in the higher phase-levels, POP+ concludes that there is no labeling failure in (5b): since who in γ is in a phase edge, the φ-sharing is preserved unlike (5a).

However, POP+ also points out that this kind of analysis raises a non-trivial problem for the ECM-sentence like (6a).

(6) a. who do you {T, {you, {γ who, {β R, {α who, TP}}}phase}}
   b. who do you {T, {you, {[R, γ who, {β R, {α who, TP}}}phase}}}

To explain the subject-to-object raising in ECM-constructions, POP+ argues that since R is universally weak, the φ-sharing in γ is required for β to be labeled just like the case with T in (4). However, once who moves to Spec,v, β should face the labeling failure same as (5a). To explain this, POP+ assumes that de-phasing can also be triggered by HM. When a non-phase-head undergoes HM to a phase-head

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2 When a head and a phrase merge, the head provides the label for the resulting set.

3 As for the reason of why a copy/trace of HM in this case does not become invisible to the NS and LA, we refer to Epstein et al. (2016) (cf. Bošković 2016).
triggered by an affixal nature of the phase-head, they form a pair-merged “amalgam”. POP+ further argues that while amalgamation is triggered by a morphological property of the affixal head, it should occur in the NS since it makes the affix in the amalgam become invisible in the NS. Then, v in the amalgam \([R, v]\) in (6b) should become invisible. As a result, the phase shrinks to RP. In short, the HM, like phase-head deletion in (5b), triggers de-phasing.

4. Analysis

We assume that XP ellipsis occurs as soon as the licensor of XP ellipsis is introduced into the derivation (Baltin 2012; Aelbrecht 2010; cf. Park 2017). According to Lobeck (1995) and Aelbrecht (2010), the licensor of VPE is T. Park (2017) argues, based on the observation that T plays a similar role in both VPE and copular phrase ellipsis, that the licensor of a copular phrase ellipsis is T. Following Park (2017), we assume here that the licensor of copular phrase ellipsis is T. Given this, the elision of \(vbP\) in (1) and (2) (i.e., copular phrase ellipsis) occurs when T merges with \(vbP\).

We also assume that internal merge to Spec,TP and the elision of \(vbP\) triggered by T are unordered, since they are the operations associated with the same head T. Therefore, at first glance, Spec,TP would seem to allow extraction form the ellipsis site in both (1) and (2). However, we propose that the reason for the asymmetry between the sentences (1) and (2) with regard to object wh-phrase extraction is attributable to whether the object wh-phrase can be located in Spec,TP (i.e., outside the ellipsis site), or not. We propose the following two distinct derivations for copular phrase ellipsis.

![Diagram of copular phrase ellipsis](image)

In (7a), the object wh-phrase can escape from the ellipsis site only if internal merge of the object wh-phrase in Spec,TP is possible as soon as T merges with \(vbP\). How is such movement possible? First, we assume that \(C_Q\) in (7a) is an affix, which creates an amalgam via HM. Then, when C merges with TP, T inherits all the features and phasehood from \(C_Q\). Due to the affixal status of C, T undergoes HM to \(C_Q\), an amalgam \([T, C]\) is created. Then since \(C_Q\) is not visible in the NS, T becomes the phase-head (de-phasing). Once de-phasing occurs, Spec,TP becomes a viable landing site for the object wh-phrase, furthermore, such movement is necessary as to not violate the PIC. Consequently, all the labels and movement of the object wh-phrase to Spec,TP in (7a) are regarded licit, since the evaluation of all the grammatical processes is applied when the phase completes (POP+). In sum, the object wh-phrase can escape from the elided \(vbP\) when de-phasing occurs.

The impossibility of extraction from an embedded copular ellipsis site, as in (2b) and (3b), can be explained if embedded \(C_Q\)s are non-affixal. If so, T-to-C HM does not occur, and TP does not turn into a phase, as in (7b). If we assume that internal merge is allowed only if interface conditions along with 3rd factor principles are satisfied at the phase-level evaluation (i.e., A-movement precedes only through phase edges), the object wh-phrase must move directly to Spec,CP. (and not via Spec,TP). In (7b),

\(^4\) POP+ assumes that any kind of acyclic merger is not allowed since it creates a “two-peaked set (Epstein et al. 2012)”(cf. Chomsky 2013).
Spec,TP, which is a non-phase edge cannot be an intermediate landing site. Then, movement of the object wh-phrase to Spec,TP will be judged illicit upon evaluation at the phase-level. Given that copular phrase ellipsis occurs as soon as T merges with \( v_bP \), the object wh-phrase which does not move through Spec,TP must remain inside the ellipsis site when \( v_bP \) is elided.\(^5\)\(^6\) In other words, extraction out of the ellipsis site will be blocked.

Our analysis fulfills SMT in explaining an apparent variability in the timing of ellipsis. Although they differ in detail, Baltin (2012) and Aelbrecht (2010) have already proposed that XP ellipsis occurs as soon as the licensor of XP is introduced into the derivation. However, their analyses alone without de-phasing cannot account for the asymmetry in (1) and (2). Regardless of the existence of T-to-C movement, ellipsis must occur when T merges with the ellipsis site. Then, they erroneously predicts that object wh-phrase extraction should be impossible, since Spec,TP cannot be an intermediate landing site of wh-movement. Most of all, our analysis does not require any suspicious options such as (i) the EPP, (ii) any other undesirable options utilizing Agree and arguably (iii) Agree itself.

5. Related Issues

5.1. The parametrization of \( C_o \): comparison with the previous analyses

Previous literature has argued that “null embedded C” is an affix (Peseksky 1991; Bošković 2011, among others). They assume that embedded null affix C itself undergoes HM to the higher head, namely lexical V, while matrix null Cs is not an affix. However, since our analysis based on POP+ assumes that the affixal head is an attractor of HM, there is no reason not to believe that the matrix C can be an affixal head.

Then, a question that arises here is how matrix subject questions are well-formed without T-to-C movement or its affixation to a higher head. Here is our answer: Unlike object wh-phrase, subject wh-phrase contains both Q and \( \phi \) features. With a proviso that a feature bundle should undergo feature sharing simultaneously, we can say that when subject wh-phrase moves to Spec,TP, both features undergo feature sharing simultaneously as shown in (8a). Then, it is natural to assume that subject wh-phrase cannot move to Spec,CP due to “criterial freezing effect” as illustrated in (8b). However, T should still move to CQ due to the affixal status of CQ as in (8c).

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\begin{align*}
\text{(8) Who bought this book?} \\
\text{a. } & \{C(\text{Q, } u\phi, \text{phase}), \{<\text{Q}, \text{Q}>, <\phi, \phi> \text{ who(Q, i}\phi), \{T T(\text{Q, } u\phi, \text{phase}), \{\text{who, vP}\}\}\} \\
\text{b. } & *\{\text{who}, \{C(\text{Q, } u\phi, \text{phase}), \{<\text{Q}, \text{Q}>, <\phi, \phi> \text{ who(Q, i}\phi), \{T T(\text{Q, } u\phi, \text{phase}), \{\text{who, vP}\}\}\} \} \\
\text{c. } & \#\{\{T T(\text{Q, } u\phi, \text{phase}), \{\text{\
\}} \}\} \\
\text{d. } & \{C(\text{Q, } u\phi, \text{phase}), \{<\text{Q}, \text{Q}>, <\phi, \phi> \text{ who(Q, i}\phi), \{T T(\text{Q, } u\phi, \text{phase}), \{\text{who, vP}\}\}\} \}
\end{align*}
\]

But, according to POP+, movement such as in (8c) should yield a “gibberish” polar question: POP+ assumes that if a head with interpretable Q feature (\( iQ \)) is not a sister of wh-operator, the sentence is interpreted as a polar question in English. Then, since the moved T in the amalgam contains an inherited \( iQ \), and since the amalgam is not a sister of any wh-operator, (8c) cannot be interpreted as an information

\[^5\] We assume that \( v_bP \) is a phase, adopting the idea that accusative \( vPs \) are also phases (Legate 2003, among others). If this is so, the object wh-phrase is located in Spec,\( v_bP \). Since the target of the elision in copular phrase ellipsis is \( v_bP \), the object wh-phrase must be elided along with \( v_bP \).

\[^6\] In case of regular VPE, extraction out of ellipsis site is allowed both in embedded and matrix questions, as illustrated in (i).

(i) a. What did John criticize and what did Mary?
    b. I know what John criticized, but I have no idea about what Mary did.

This is because the phase VoiceP provides an escape hatch for wh-phrase extraction. When the verbal domains contain Voice, VoiceP but not vP, is a phase (Legate 2014, among others). The ellipsis site of regular VPE is vP, and the licensor is T. This means the elision of vP does not occur until T merges with VoiceP. When T is introduced into the derivation, the object wh-phases have already been located in Spec,VoiceP (i.e., outside the ellipsis site). Thus, the ellipsis site in regular VPE does not contain the object wh-phrases.
wh-question. The problem can be avoided if the matrix $C_0$ is deleted by a phase-head deletion as shown in (8d): The deletion of the affixal head can prevent the HM. Therefore (8d) will not become a “gibberish” while preserving the CP with the TP phase just as object wh-sentences like (7a) (cf. truncated IP analyses; e.g., Bošković 1997).

5.2. Farsi/Korean Data and the De-phasing Analysis

The de-phasing approach may also be extended to account for the Farsi extraction facts in (9) and (10). Farsi complex predicates may consist of a light verb taking a non-verbal element (e.g. NP, PP, AP) as its complement. According to Folli, Harley, and Karimi (2005), and Toosarvandani (2009), light verbs are base-generated in $v$, and the ellipsis site of Farsi complex predicate ellipsis is the non-verbal element of the complex predicate, as illustrated in (10) (i.e., NP in (10b)). (10) shows that this type of ellipsis allows A-bar extraction out of the ellipsis site.

This extraction fact can be accounted for as follows: Suppose first, that the verbal domain of the complex predicate contains a Voice layer and that VoiceP, not $vP$, is a phase (Legate 2014, among others). Suppose also, that Farsi (light) verbs moves to Voice, which is expected by the Head Movement Constraint (Travis 1984), if Farsi (light) verbs move to C (Shafiei 2016). Suppose further that, an element base-generated inside the non-verbal element moves by A-bar movement. Then, if $v$ to Voice movement triggers de-phasing, Spec,$vP$ becomes a viable intermediate landing site for movement from the elided site, similar to [Spec, TP] after T-to-C movement in English discussed above. In sum, moved element can be located outside the ellipsis site, namely Spec,$vP$, at the point of ellipsis:

(11) ... ... \{[zade_2, voice], \{[vP SHARVĀR-O_1, \{v, zade_2, \{NP SHARVĀR-O_2, otu\}\}\}\}\}^{phase} \]

The analysis above predicts that extraction out of the complement of $v$ would be blocked if $v$ does not undergo HM to Voice. We will argue that the prediction is indeed borne out in Korean. Park (2017) argues that Korean has VP ellipsis, whereby the complement VP of the light verb $ha$, which functions as an ellipsis licensor and is base-generated in $v$, is elided. He calls this construction light verb (LV) stranding ellipsis, which is exemplified in (12).


‘John thought that Mary was clever.’

B: Tom-un [VP e } an-ha-ess-e. Tom-TOP NEG-LV-PAST-D

‘(Intended) Tom did not think that Mary was clever.’ (Park 2017)

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\footnote{Here, we assume that a so-called “double labeling” is possible. We also follow POP$^+$ in that the substantive feature like Q should be interpretable. As for the role of (un)interpretable feature(s) in the moved head in an amalgam, see POP$^+$ (footnote 12, page 11).}
Similar to Farsi complex predicate ellipsis, the complement of the light verb (generated in v) serving as the ellipsis licensor is elided in Korean LV stranding ellipsis. However, the only difference is that v does not undergo head movement in Korean (Ahn 1991; Park 2017, among others). Then, it is predicted that extraction of an element out of the ellipsis site would not be permitted. This prediction is borne out, as illustrated in (13).

    Bill-ACC Mary-TOP Kim-NOM like-C think NEG-DO-PRES-D
    ‘Mary does not think that Kim likes Bill.’
    Tom-ACC John-TOP Kim-NOM like-C think NEG-DO-PRES-D
    ‘John does not think that Kim likes Tom.’ (Park 2017)

References
