Movement Approach to Argument Ellipsis: A PF-deletion analysis

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1. Introduction

This paper investigates argument ellipsis (AE), attested in languages like Japanese and Korean (Oku 1998; Kim 1999; Saito 2007; Takahashi 2008; Sakamoto 2017). AE can be applied to arguments like objects, subjects, and clausal complements, but not to adjuncts, as exemplified in (1) (Oku 1998; Shinohara 2006). Following the antecedent clause in (1a), the missing object in (1b) can be contained in interpretation, whereas the missing adjunct in (1c) cannot.

(1) a. Mary-wa yukkurito zibun-no booru-o nageta noni,   [Antecedent]
       Mary-top slowly   self-gen ball-acc threw   but
       'Mary threw her ball slowly, but…'
     b. Bill-wa   yukkurito _____ nagenakatta.   [AE of object]
       Bill-top   slowly   not.threw
       lit. 'Bill didn't throw __ slowly.'   (Sloppy: 'Bill didn't throw his ball slowly.')
     c. Bill-wa   _____ zibun-no booru-o nagenakatta.   [*AE of adjunct]
       Bill-top   self-gen ball-acc not.threw
       lit. 'Bill didn't throw his ball ___.' (*'Bill didn't throw a ball slowly'.)

Importantly, the elided reflexive zibun 'self' creates a new binding relation with the subject 'Bill.' Such interpretation is called sloppy interpretation and taken as evidence for ellipsis. Although Japanese allows a null pronoun to occur in an empty position (Kuroda 1965), it is known that sloppy readings cannot be obtained by a pronoun (see Saito 2007).

AE has been analyzed as involving LF-copy, not PF-deletion, since it was first proposed by Oku (1998). The LF-copy analysis of AE is based on Bošković and Takahashi's (1998) idea on Japanese-type scrambling (i.e. long-distance scrambling). They consider theta-roles to be formal features, and argue that theta-features need not to be checked in syntax in Japanese, and thus theta-positions can be empty as long as their features are checked at LF. Theta-features can be checked by a base-generated "scrambled" element at LF (Bošković and Takahashi 1998) or LF-copy from the antecedent clause as in (2) (Oku 1998).

(2)   Antcedent clause: [_CP_ [_TP_ Subj Obj V]]
       a. syntax: [_CP_ [_TP_ Subj __ V]]
       b. LF: [_CP_ [_TP_ Subj Obj V]]   : LF-copy

In short, the LF-copy analysis assumes that a missing argument is not present in overt syntax, and it is copied onto a relevant theta-position at LF from a linguistic context without its phonological feature.

In contrast to the standard analysis, I argue that AE is derived by PF-deletion in this paper. In particular, this paper pursues Fujiwara's (to appear) proposal for AE, that is, an elided element gets deleted at PF after it has undergone movement to the matrix SpecCP (cf. Zagona 1982; Johnson 2001; Aelbrecht and Harwood 2015). The proposed PF-deletion approach to AE is illustrated in (3), where an object moves to the matrix SpecCP, and gets deleted at PF.

(3)   a. syntax: [$_{CP}$ Obj [Subj t_{Obj} V]]   b. PF: [$_{CP}$ ~~Obj~~ [Subj t_{Obj} V]]

Note that this approach also captures the intuition behind Oku's analysis of AE. Namely, both Oku's and my approaches suggest the correlation between AE and long-distance scrambling. In fact, the (un)availability of AE depends on the (im)possibility of long-distance scrambling, as shown in (4).[1]

(4)   a. Booru-o John-ga   [Mary-ga   yukkurito t nageta to] itta.
          ball-acc John-nom Mary-nom slowly   threw   C   said.
          lit. 'a ball, John said [that Mary threw t_{obj} slowly].'
       b. *Yukkurito John-ga [Mary-ga   t booru-o nageta to] itta.
          slowly   John-nom Mary-nom   ball-acc threw C   said.
          intended. 'Slowly, John said [that Mary threw a ball t_{adv}] .'   (Sugisaki 2000, 387)

The goal of this paper is to provide several arguments that favor the proposed PF-deletion approach in (3) to the LF-copy approach in (2).

2. Extraction out of an ellipsis site

The empirical argument for the LF-copy analysis is originally observed by Shinohara (2006) and developed by Saito (2007) and Sakamoto (2017). Their argument is based on the observation that overt extraction out of an ellipsis site is not possible. First, consider Japanese ECM constructions, where an embedded subject gets accusative, as in (5a). It has been argued that this subject can undergo A-movement out of the embedded CP (Kuno 1976; Hiraiwa 2001; Tanaka 2002). A matrix adverb preceded by the embedded subject confirms that the embedded subject is located in the matrix clause. In this case, the embedded CP cannot be elided (Tanaka 2008). According to Tanaka (2008) and Sakamoto (2017), the ungrammaticality of (5b) can be straightforwardly captured by the LF-copy analysis: the elided CP is not present in overt syntax

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[1] The ungrammaticality of (4b) is not uncontroversial. Saito (1985) reports, with different data, that long-distance scrambling of manner adverbs is possible. On the other hand, Sugisaki (2000), Takita (2011) and Yamashita (2013) judge (4b) to be ungrammatical. I will not discuss the speaker variation here, but what is important is that the adjunct-argument asymmetry in scrambling becomes even stronger when we use interrogative as an embedded clause. In (i), the embedded clause is a *wh*-interrogative and scrambling of the adjunct out of it is ungrammatical, as shown in (ia). Note that scrambling of the object is still grammatical, as in (ib).
(i)   a. Booru-o John-wa [dare-ga   yukkurito t nageta ka] itta.
          ball-acc John-Top who-nom slowly   threw   Q   said
          lit. 'a ball, John said (to us) who threw t slowly.'
       b.*Yukkurito, John-wa [dare-ga   t booru-o nageta ka] itta.
          slowly   John-Top who-nom   ball-acc threw Q   said
          int. 'Slowly, John said (to us) who threw a ball t.'
I take this contrast as evidence that long-distance scrambling of adjuncts isbanned.

so that no elements can be extracted out of it.

(5) a. Taro-ga   Hanako-o$_i$ orokanimo [$_{CP}$ t$_i$ tensai da   to]   omotta.
       Taro-nom Hanako-acc stupidly   genius cop C   thought
       'Taro stupidly thought that Hanako is a genius.'
     b. *Sachiko-wa   Ziroo-o   orokanimo _____   omotta.
       Sachiko-top Ziro-acc stupidly   thought
       'Sachiko stupidly thought that Ziro is a genius.' (Tanaka 2008, 21: slightly modified)

Next, let's consider (6), where the embedded object is scrambled out of the embedded clause. (6b) shows that the ellipsis of the remnant CP is not possible.

(6) a. Hon-o   Taroo-wa [$_{CP}$ Hanako-ga t$_i$ kat-ta   to] it-ta   ga,
       book-acc Taro-top   Hanako-nom   buy-past C say-past but
       'Taro said that Hanako bought a book, but…'
     b. *Zassi-o   Ziroo-wa   _____   it-ta.
       magazine-acc Ziro-top   say-past
       'Ziro said that she bought a magazine.' (Saito 2007, 210)

The representations of the antecedent clause and the ellipsis clause under the LF-copy analysis are given in (7) and (8), respectively. In (7b), the scrambled object undergoes reconstruction at LF (Saito 1989). The LF-representation of the ellipsis clause in (8b) is clearly illegible because it has two instances of the embedded object.[2]

(7) Antecedent clause
     a. Syntax: book, [Taro [$_{CP}$ Hanako   t   bought C] said]
     b. LF: [Taro [$_{CP}$ Hanako book bought C] said]   (LF reconstruction)
(8) Ellipsis clause
     a. Syntax: magazine, [Ziro _____ said]
     b. LF: magazine, Ziro [$_{CP}$ Hanako book bought C] said (*LF reconstruction)

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[2] Note that even when the extracted object is identical, the sentence is still ungrammatical as shown in (i).
(i)   a. Sono-hon-o   Taroo-wa [$_{CP}$ Hanako-ga   t$_i$ kat-ta   to] it-ta   si,
          this-book-acc Taro-top   Hanako-NOM   buy-past C say-past and
          'Taro said that Hanako bought this book'
        b. *Sono-hon-o   Ziroo-mo _____   it-ta.
          this-book-acc Ziro-also   say-past
          'Ziro also said that she bought this book.' (Saito 2007, 210)
The LF-representation of (ib) is illustrated in (ii). In order to explain its ungrammaticality, one has to stipulate that the object copied from the antecedent clause cannot be considered as related (under the copy theory) to the scrambled object in the ellipsis sentence.
(ii)   LF: this book$_E$, Ziro [$_{CP}$ Hanako this book$_A$ bought C] said
Sakamoto (2017) avoids making this stipulation by adopting a regular (i.e. bottom-up) approach to scrambling, which is a departure from Oku's (1998) original motivation on the LF-copy analysis based on Bošković and Takahashi's (1998) mechanism on theta-checking in Japanese. Under Sakamoto's explanation, (ib) is deviant because there is no internal structure to the elided clause in syntax (argument ellipsis being LF-copying) so that no element can be extracted out of it. Although this explains the ungrammaticality of (ib) without the stipulation, the original motivation for LF-copying disappears, which makes the distinction between arguments and adjuncts in argument ellipsis unclear. Thus, I do not discuss Sakamoto's (2017) version of the LF-copy account here, but the arguments against LF-copy in Sect. 3 would also hold for this version of the LF-copy account.

Although these data can be captured by the LF-copy approach, the proposed PF-deletion approach can also account for them. Under the PF-deletion account, the ungramaticalities of (5b) and (6b) are attributed to the ungrammaticalities of their movement counterparts in (9), where the embedded CP undergoes movement to the matrix SpecCP (Tanaka 2008).

(9)   a. *[$_{CP}$ t_i tensai da to] Sachiko-wa Ziroo-o_i orokanimo t_{CP} omotta. (cf. 5b)
           genius cop C   Sachiko-top Ziro-Acc   stupidly   thought
       lit. '[$_{CP}$ That t_i is a genius] Sachiko stupidly thought Ziro$_i$ t_{CP}.'
      b. *[$_{CP}$ Hanako-ga ti kat-ta   to] zassi-o   Ziroo-wa t_{CP} it-ta. (cf. 6b)
           Hanako-Nom   buy-Past C   magazine-Acc Ziro-Top   say-Past
       lit. '[$_{CP}$ That Hanako bought t_i], a magazine$_i$, Ziro said t_{CP}.'

Thus, the impossibility of overt extraction out of an ellipsis site does not conclusively show that AE involves LF-copy.

In fact, Sakamoto (2016a; cf. Tanaka 2008) has reported that overt extraction out of an ellipsis site is indeed possible in certain environment.[3] In Japanese, an adverbial pronoun *soo* 'this/so' optionally appears after a complement clause behaving like an expletive like Hindi *yah* 'this' (Mahajan 1990). In (10a), this element occurs in the ECM construction. Interestingly, as shown in (10b), the embedded CP can get elided when *soo* appears. As expected under the proposed PF-deletion approach, it can also undergo movement, as in (11).

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[3] Goto (2011) reports that (6b) becomes grammatical when the extracted object is contrastively focused with a topic marker -*wa*, as shown in (i).
(i)   a. Hon-wa   Taroo-ga [$_{CP}$ Hanako-ga t_i kat-ta   to] it-ta   ga,
          book-top   Taro-nom   Hanako-nom   buy-past C say-past but
          lit. 'A book, Taro said that Hanako bought t, but…'
       b. Zassi-wa   Ziroo-ga _____ it-ta.
          magazine-acc   Ziro-top   say-past
          lit. 'A magazine, Ziro said ___.' (Goto 2011, 245)
Note that the movement counterpart of (ib) is also grammatical, as shown in (ii).
(ii)   [$_{CP}$ Hanako-ga t_i kat-ta   to] zassi-wa$_i$ Ziroo-ga t_{CP} it-ta.
          Hanako-nom   buy-past C   magazine-top Ziro-nom   say-past
          lit. '[that Hanako bought t_i], magazine$_i$, Ziro said t_{CP}.'
Nevertheless, (Saito 1985) finds that topicalization of a DP argument in a relative clause is slightly more acceptable than its scrambling conterpart, and argues that topicalization of a DP does not involve movement but base-generation. However, to my ears at least, topicalization of an argument out of an adjunct clause sounds worse than its crambling counterpart, as in (iii).
(iii) Kuruma$_i$-{*wa | ?*o} Mary-ga [$_{CP}$ otoosan-ga t_i ara-u   toki] sigoto-o tetuda-u.
          car-top/acc   Mary-nom father-nom   wash-pres when job-acc help-pres
          lit. 'Cars$_i$, Mary helps his father with his work [when he washes t_i].'
In addition, a resumptive pronoun cannot appear in the thematic position in the overt counterpart of (ib) and (ii).
(iv)   a. *Zassi$_i$-{wa | o}   Ziroo-ga [$_{CP}$ Hanako-ga sore$_i$-o kat-ta   to] it-ta.
          magazine-top/acc   Ziro-nom   Hanako-nom it-acc   buy-past C   say-past
          lit. 'A magazine$_i$, Ziro said that Hanako bought it$_i$.'
(iv)   b. *[$_{CP}$ Hanako-ga sore$_i$-o kat-ta   to] zassi$_i$ -{wa | o}   Ziroo-ga t_{CP} it-ta.
          Hanako-nom   it-acc   buy-past C   magazine-top/acc Ziro-nom   say-past
          lit. '[that Hanako bought it$_i$], magazine$_i$, Ziro said t_{CP}.'
This also suggests that topicalization does not involve base-generation. I leave the issue of whether (ib) actually involves extraction out of an ellipsis site or not for future research.

(10) a. Taro-ga   Hanako-o$_i$ orokanimo [$_{CP}$ t$_i$ tensai da   to] **soo** omotta.
          Taro-nom Hanako-acc stupidly   genius cop C   this thought
          'Taro stupidly thought that Hanako is a genius.'
      b. Sachiko-wa   Ziroo-o   orokanimo _____   **soo** omotta.
          Sachiko-top Ziro-acc stupidly   this thought
          'Sachiko stupidly thought that Ziro is a genius.' (Sakamoto 2016, 113)
(11) [$_{CP}$ t$_i$ tensai da   to] Taro-ga   Hanako-o$_i$ orokanimo t$_{CP}$ **soo** omotta.
          genius cop C Taro-Nom Hanako-Acc stupidly   this thought
      'Taro stupidly thought that Hanako is a genius.'

The possibility of overt extraction out of the ellipsis site in (10b) indicates that the elided CP indeed has internal syntax, which supports the PF-deletion analysis.[4]

3. Empirical arguments for the PF-deletion approach

There are three additional kinds of empirical arguments that favors the PF-deletion analysis to the LF-copy analysis. The first argument comes from ellipsis of a local anaphor. As shown in (12), movement changes the binding relation of Japanese local anaphors. In (12a), 'herself' is located in the embedded object position and cannot refer to the matrix subject 'Mary', which shows that 'herself' is a local anaphor. However, as can be seen in (12b), when this reflexive undergoes long-distance scrambling, it can refer to the matrix subject 'Mary' (cf. Saito 2003). This suggests that the binding relation here is established in the intermediate position *t'*.

(12) a. *Mary-wa [$_{CP}$ John-ga   kanojozisin-no keiken-o   hanasi-tagaranai   to]
          Mary-TOP   John-NOM   herself-GEN   experience-ACC tell-want.not   C
          omotta.
          thought
          lit. 'Mary thought that John does not want to tell herself's experience.'
      b. [Kanojozisin-nokeiken-o]$_i$ Mary-wa [$_{CP}$ t'$_i$ [$_{CP}$ John-ga   t$_i$ hanasi-tagaranai
          to]] omotta.
          'Herself's experience$_i$, Mary thought that John does not want to tell t$_i$.'
(13) Nancy-mo [$_{CP}$ Bill-wa _____ hanasi-tagara-nai to] omotta.
      Nancy-also   Bill-TOP   tell-want-NEG   C thought
      lit. 'Nancy also thought [that Bill does not want to tell __].' (^{OK} Sloppy)

Taking (12b) as an antecedent, the local reflexive gets deleted in (13). Importantly, (13) is grammatical and moreover it yields a sloppy reading. This suggests that the elided anaphor in (13) has moved as in (12b).[5] In other words, the elided element establishes the binding relation with the matrix subject 'Nancy' in the intermediate position. The derivation of (13) under the proposed PF-deletion approach is given in (14). The PF-deletion approach is consistent with the existence of such intermediate positions in a derivation of ellipsis because it assumes that an elided element undergoes movement, in particular, in syntax.

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[4] In addition, Sakamoto (2017) shows that covert extraction out of the elided clause with *soo* in the ECM constructions is also possible.
[5] Here, I crucially assume that the reflexive *herself* does not undergo vehicle change (Fiengo and May 1994) into a pronoun *her* in order to derive a sloppy reading (see Fujiwara to appear for the relevant discussion).

(14)   a. [TP Nancyᵢ [CP [TP Bill herselfᵢ …]]]
      b. [TP Nancyᵢ [CP herselfᵢ [TP Bill t …]]]
      c. [CP herselfᵢ [TP Nancyᵢ [CP t [TP Bill t …]]]

In contrast, under the LF-copy approach, it is difficult to capture this binding relation since it assumes that the antecedent is copied onto its theta-position, not an intermediate position.

The second piece of evidence that argument ellipsis involves PF-deletion is that an elided element is interpreted in its case-position. In Japanese, the conjunction -mo-mo 'and' is a positive polarity item (PPI), and it must take scope over negation (Goro 2007). (15) illustrates this point with an object and a subject.

(15)   a. John-wa [kyabetsu-mo   daikon-mo]   tabe-nak-atta   yo.
        John-top   cabbage-also   radish-also   eat-neg-past   prt
        lit. 'John did not eat [the cabbage and the radish].'
        (and > not): 'It is both the cabbage and the radish that John did not eat.'
        *(not > and): 'It is not the case that John ate both the cabbage and the radish.'
      b. [John-mo   Bill-mo] kyabetsu-o   tabe-nak-atta   yo.
        John-also   Bill-also cabbage-acc   eat-neg-past   prt
        lit. '[John and Bill] did not eat cabbages.'
        (and > not): 'It is both John and Bill that did not eat the cabbage.'
        *(not > and): 'It is not the case that John ate both the cabbage and the radish.'

It is known that ellipsis cancels polarity sensitivities of the polarity items such as *anyone* and *someone* (Sag 1976; Johnson 2001; Merchant 2013). In (16a), the elided NPI anyone is not licensed by negation, and in (17a), the elided PPI someone does not take scope over negation.

(16)   a. John didn't see anyone, but Mary did ~~[see anyone]~~.
      b. *John didn't see anyone, but Mary saw anyone.
(17)   a. John saw someone, but Mary didn't ~~[see someone]~~.   (not > some / *some > not)
      b. John saw someone, but Mary didn't see someone.   *(not > some / some > not)

The polarity sensitivity of *-mo-mo* also disappears when it is elided (Funakoshi 2013). As in (18b), the elided conjunction can take scope under negation. Crucially, the elided conjunction does not take scope under negation when it is placed in the subject position, as shown in (19).

(18)   a. John-wa [kyabetsu-mo   daikon-mo]   tabe-ta   kedo,
        John-top   cabbage-also   radish-also   eat-past   but
        'John ate [the cabbage and the radish], but…'
      b. Bill-wa _____   tabe-anak-atta.
        Bill-top   eat-neg-past
        lit. 'Bill did not eat __.' (and > not) /ᴼᴷ(not > and)
(19)   a. [John-mo Bill-mo] kyabetsu-o   tabe-ta.
        John-also Bill-also   cabbage-acc   eat-past
        'John and Bill ate cabbages'
      b. Demo _____   daikon-wa   tabe-nak-atta.
        but   radish-top   eat-neg-past
        lit. 'But __ did not eat radishes.' (and > not)/*(not > and)

This indicates that an elided subject is interpreted not in its theta-position (i.e. Spec*v*P), but in its case-position (i.e. SpecTP). The PF-deletion account can naturally capture this subject-object asymmetry. The subject undergoes movement to SpecCP through its case-position in syntax and gets deleted at PF (see Chomsky 1995 and Lasnik 1998 for the lack of reconstruction effects under A-movement, which is also assumed here). On the other hand, this is unexpected under the LF-copy analysis, in which an elided element would have to be copied onto its theta-position at LF.[6]

The third piece of evidence that the relevant elements are elided by PF-deletion comes from comparison between Japanese and Korean double accusative constructions. As exemplified in (20), multiple occurrences of accusative particles are not allowed in Japanese (i.e. double-*o* constraint), where Korean does not have such a constraint (Shibatani 1977).

(20) a. John-wa [kankokugo-no tango]-no/***o** anki-**o**   sita.   [Japanese]
        John-top Korean-gen   word-gen/acc memorizaton-acc did
        'John did memorization of Korean words.'
     b. John-un [hankwuke   tane]-**lul**   kiek-**ul**   hayss-ta.   [Korean]
        John-top Korean   word-acc   memorization-acc did-decl
        'John did memorization of Korean words.'

Interestingly, the internal object of the verbal noun cannot be elided in Japanese, while it can in Korean, as in (21). Japanese example in (21a) only means that Sue did not do memorization at all, while the one in Korean (21b) can contain the internal argument in its interpretation.

(21) a. *Demo   Sue-wa   ____   anki-o   si-nak-atta.   [antecedent: 20a]
        but   Sue-top   memorization-acc do-neg-past
        int. 'But Sue did not do memorization of Korean words.'
     b. Kulena Sue-nun ____   kiek-ul   haci anh-ass-ta.   [antecedent: 20b]
        But   Sue-top   memorization-acc do   neg-past-decl
        int. 'But Sue didn't do memorization Korean words.'

Both of the approaches can capture the possibility of AE in Korean (21b) since the internal argument can undergo long-distance movement, as illustrated in (22).

(22) Hankwuke tane-lul,   Bill-un [CP Sue-ka t kiek-ul   hayssta-ko]
      Korean   word-acc Bill-top   Sue-nom   memorize-acc did-C
      sayngkakhayss-ta. [Korean]
      thought-decl
      lit. 'Korean words, Bill thought [that Sue did memorization of t].'

The question here is why ellipsis of the internal argument in (21a) is not allowed. Intuitively, the unavailability of AE in (21a) can be attributed to the impossibility of long-distance movement of the genitive-marked argument, as in (23).

(23) *[Kankokugo-no tango]-no Bill-wa [CP Sue-ga t anki-o   sita to]

_____
[6] Saito (2007) in fact argues that the LF-copied item lacks its Case-feature.

Korean-gen   word-gen   Bill-top   Sue-nom   memorizaton-acc   did   C
omotta.   [Japanese]
thought
lit. 'Korean words, Bill thought [that Sue did memorization of t].'

Nevertheless, given that double accusatives are in principle possible as in Korean (20b) and (22), we should also address why the structure used in Korean (21b) cannot be used in Japanese (21a). The PF-deletion approach can attribute the unavailability of the double-accusaive structure in (21a) to the double *o*-constrant. Note that if the accusative particle attached to the verbal noun is dropped as in (24), AE of the internal argument becomes possible. This ensures that the unavailability of AE in (21a) is due to the double *o*-constraint at least partially.

(24)   Demo   Sue-wa   ____   anki   si-nak-atta.   (cf. 21a)   [antecedent: 20a]
but   Sue-top   memorization   do-neg-past
int. 'But Sue did not do memorization of Korean words.'

In contrast, it is unclear under the LF-copy approach why the internal argument cannot be copied onto the ellipsis site in Japanese but can be in Korean. Note that the only difference between (21a) and (21b) is the case-particle of the antecedents in (20a) and (20b). The antecedent in (21a) has genitive case, whereas the one in (21b) accusative case. Under the assumption of the LF-copy approach that a copied element is an LF object, it is difficult to address the difference in case.

4. Theoretical implications

So far, I have argued that AE involves PF-deletion, not LF-copy. This section discusses why it is so. I first point out two conceptual issues on LF-copy. LF-copy is regarded as Merge of an LF-object (Saito 2007). However, they are crucially different in a way they establish a relation between the original item and its copies. In regular movement, each copy is related through c-command, but the original element (i.e. antecedent) and the elided material are not under the LF-copy analysis. This means that something like coindexiation may then be needed to establish the relation between the antecedent and the copy, but this would violate Inclusiveness Condition (Chomsky 1995).[7]

Second, LF-copy is counter-cyclic. It is often assumed that an LF-object (i.e. an element transfered to semantics) in the antecedent clause is copied into the LF representation of the ellipsis sentence that is fully constructed, as in (24).

(24)   a. Antecedent clause   b. Ellipsis clause
LF: [$_{TP}$ Subj [$_{v'}$ [$_{VP}$ Obj V] v] T]   Syntax: [$_{TP}$ Subj [$_{v'}$ [$_{VP}$ __ V] v] T]
LF: [$_{TP}$ Subj [$_{v'}$ [$_{VP}$ Obj V] v] T] (LF-copy)

The derivation in (24b) is counter-cyclic because the object position enters into a computational process at LF after the relevant position has already computed in the syntax. One way to avoid this problem would be to assume to copy an LF element (i.e. an element transferred to

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7   See also Nunes (2004) for arguments against Chomsky's (1995) idea on ellipsis, which is similar to the LF-copy approach in the sense that an elided element and its antecedent are chain-connected.

semantics) in the antecedent clause onto the relevant position in the ellipsis clause in overt syntax (cf. Saito 2007; Sakamoto 2016b), as in (25). In (25b), when the phase vP is computed, an LF object in the antecedent clause is copied onto the complement of V.

(25) a. Antecedent clause   b. Ellipsis clause
          LF: [$_{TP}$ Subj [$_{v'}$ [$_{VP}$ Obj V] v] T]   Syntax: [$_{vP}$ Subj [$_{v'}$ [$_{VP}$ Obj V] v]]

Note, however, that this is similar to PF-deletion in the sense that there is internal syntax to the elided element. Moreover, it is in effect equivalent to the late lexical insertion view of PF-deletion (Aelbrecht 2009), that is, an element affected by ellipsis does not undergo vocabulary insertion. Therefore, LF-copy is conceptually undesirable.

On the other hand, the proposed PF-deletion approach to AE can be naturally captured under the copy theory of movement (Fujiwara to appear; cf. Chomsky 1995; Johnson 2001). Under the copy theory of movement, movement follow from Internal Merge and Deletion of lower copies. I argue that ellipsis is the case where all copies are deleted. Obviously, deletion of all the copies creates a recoverability problem: elided elements must be recoverable. I assume that the highest copy is recoverable only when it occupies the matrix SpecCP, where it can find a linguistic antecedent from discourse.[8] The copy theory of ellipsis is conceptually desirable since we do not need to posit special operations for ellipsis phenomena. In other words, ellipsis is an instance of movement under this approach. This naturally explains why ellipsis applies PF-deletion, not LF-copy: copies undergo 'deletion' under the copy theory of movement.

5. Conclusion

This study has investigated argument ellipsis attested in Japanese and Korean focusing on the nature of the ellipsis site. Following Fujiwara (to appear), I have claimed that argument ellipsis involves PF-deletion, which is applied to a moved element in the matrix SpecCP. In this paper, it has been shown that the apparent empirical argument for the LF-copy approach discussed by Saito (2007) and Sakamoto (2017) can also be accounted for under the proposed PF-deletion approach. Moreover, I have provided several pieces of empirical evidence that supports the PF-deletion approach, and pointed out conceptual issues regarding the LF-copy approach. I have suggested that the PF-deletion analysis of argument ellipsis can be naturally accounted for under the copy theory. Under the copy theory, a regular movement deletes lower copies and pronounce the highest copy, whereas all the copies are deleted in ellipsis. This copy theory approach to ellipsis provides a principled account for why the operation used in argument ellipsis is not LF-copy but PF-deletion.

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[8] The idea that a null element is identified in the matrix CP is not new; the relation between the highest position in the root clause and the discourse context has also been investigated in other phenomena, especially topic drop in other languages (Tsao 1977; Huang 1984; Haegeman 2000; Rizzi 1994; Cardinaletti 1990; Sigurðsson 2011; Sigurðsson and Maling 2010; Mörnsjö 2002; Nygard 2018; Bošković 2011; a.o). For example, Rizzi (1994) defines this position in terms of the identification requirement of the Empty Category Principle (ECP). According to him, empty categories except *pro* and PRO must be identified by being chain-connected to an antecedent unless they occupy the specifier of the root clause, where they can be identified from discourse context. In Sigurðsson and Maling's (2010) term, null elements are licensed by a context-linking element such as topic, logophoric agent/speaker and logophoric patient/hearer, which is placed higher than regular CPs.

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