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On the Lack of VP-ellipsis in Japanese and Its Ramifications in a Cross-linguistic Perspective*

Koji Hoshi

Abstract

In this article, I will make a point that the lack of VP-ellipsis in Japanese, both genuine and in-disguise, can receive natural accounts on the assumption that the language in question employs overt [V-v] movement to T in narrow syntax (NS). I will also put the relevant fact in Japanese in a cross-linguistic perspective, arguing that (un)availability of VP-ellipsis in natural language is at least regulated by typology of verbal morphology permitted by UG among other factors. To the extent that the considerations in this article are on the right track, the following two theoretical implications can be drawn: (i) PF-deletion process of chain links (= Chain Reduction) is distinct from PF-deletion for VP-ellipsis, as claimed by Nunes (1999, 2004), contra Chomsky (1993); (ii) Overt movement of a verbal element should be located in NS rather than in the phonological component, as argued by Zwart (2001) and Matushansky (2006) *inter alia*, contra Chomsky (2001).

1. Introduction

Owing to the past research surrounding the topic of VP-ellipsis in natural language, it has been made clear in the literature that it is of necessity to differentiate the following three types of relevant constructions in (1) (Otani and Whitman, 1991; Hoji, 1998; Lasnik, 1997, 1999, 2000, 2003; McCloskey, 1991; Doron, 1999; Goldberg, 2005 *inter alia*.).[1), 2)]

(1) a. **Genuine VP-ellipsis Construction in English:**
John threw out his letters, and Mary **did** [$_{vP}$ e] too.

b. **VP-ellipsis in Disguise Construction in Hebrew:**
dani ohev et iSt-o, aval moSe **sone** [$_{vP}$ e].
Dani loves ACC wife-his but Moshe hates
'Lit. Dani loves his wife, but Moshe hates.'
(= adapted from Doron, 1999:131, (20))

c. **Null Object Construction in Japanese:**
John-wa zibun-no tegami-o sute-ta.
John-TOP self-of letter-ACC discard-PAST
'John$_i$ threw out self$_i$'s letters.'
Sosite, Mary-mo [$_{DP}$ e] **sute-ta**.
And, Mary-also discard-PAST
(= adapted from Otani and Whitman, 1991: 346-347, (4))

In the case of genuine VP-ellipsis (henceforth GVPE for short) in (1a), a vP is elided while an inflected auxiliary verb is present.[3] In contrast, in the case of VP-ellipsis in disguise (henceforth VPEID for short) in (1b), a vP is elided while an inflected main verb is present instead of an auxiliary verb. Finally, in the case of the construction illustrated in (1c), an object in a vP is elided while an inflected verb occurs. Although it resembles the case of VPEID at first blush, it has been discussed in the literature that it embodies a totally different construction.

Otani and Whitman (1991) argue that the null object construction in Japanese as in (1c) is to be analyzed on a par with GVPE in English as in (1a), concomitantly claiming that Japanese has overt V-raising to T on the basis of their VP-ellipsis analysis of the construction in (1c) in Japanese (see section 2.2 for more details). Since the Japanese counterpart is syntactically different from GVPE in English in that a finite main verb is not elided, Otani and Whitman (1991) refer to it as VPEID. However, Hoji (1998) convincingly demonstrates that the construction in (1c) has different properties from GVPE in English (see section 2.2 for more details).[4] Thus, following Hoji (1998), I will call the construction in (1c) *the null object construction* in the ensuing discussion.

As adumbrated above, although the issue centering around the status of the null object construction in (1c) has been addressed by the above-mentioned authors, the fundamental question of why Japanese lacks both GVPE and VPEID in the first place has not been posed in the past literature, let alone no attempt has been made to answer this question. Therefore, the puzzle at hand still remains to be solved.

The main goal of this article is to address this puzzle and provide principled

accounts for it, teasing out some theoretical implications of my analysis for linguistic theory. To be more specific, I will argue that, as it turns out ironically, the impossibility of GVPE and VPEID in Japanese is (at least in part) to be naturally derived from postulating the very existence of overt [V-v]-movement to T, as originally claimed by Otani and Whitman (1991), while still maintaining the validity of Hoji's (1998) analysis, by adopting the PF-deletion approach to VP-ellipsis under the copy theory of movement in the minimalist program (MP) (see Chomsky and Lasnik, 1993; Merchant, 2001, 2004 *inter alia.*).[5] Thus, to the extent that my analysis in this article is on the right track, Otani and Whitman (1991) were partly correct in claiming the existence of overt V-raising in Japanese.

This article is organized as follows. Section 2 looks at the puzzle of the lack of VP-ellipsis in Japanese. Section 3 attempts to solve the puzzle in question by appealing to overt movement of the verbal complex [V-v] to T in Japanese. Section 4 extends my analysis on the lack of VP-ellipsis in Japanese to other languages such as French, German, English, Chinese, Hebrew, Portuguese and Irish by advancing verbal morphology-based accounts for cross-linguistic typological patterns of (un)availability of VP-ellipsis. Section 5 briefly considers some theoretical implications of my analysis for linguistic theory. Section 6 concludes this article.

2. The Puzzle: Lack of VP-ellipsis in Japanese

In this section, I will present empirical evidence to show that Japanese lacks both GVPE and VPEID in turn, which constitutes the relevant puzzle to be solved in the next section.

2.1 Non-existence of GVPE in Japanese

Suppose that main verbs stay in situ in narrow syntax (NS) in Japanese on a par with English. If such is the case, in principle, VP-ellipsis should be possible along the lines of the PF-deletion analysis of VP-ellipsis in English. First, witness (2).

(2) a. John ate raw fish.
b. Bill did [$_{vP}$ e], too.

On the PF-deletion analysis of VP-ellipsis, (2) is derived as roughly depicted in (3).

(3) a. Spell-Out: [$_{TP}$ John$_i$ T(PAST) [$_{vP}$ t$_i$ eat raw fish]]
b. PF: [$_{TP}$ Bill$_i$ T(PAST)+do ~~[$_{vP}$ t$_i$ eat raw fish]~~], too. (← *do*-support)

In the phonological component, the vP in (3b) is elided by the PF-deletion process for VP-ellipsis, which triggers the operation of *do*-support (Chomsky, 1957) as a last resort to rescue the stranded affixal T. Note that V (or more exactly the [V-v] verbal complex) stays in situ in (3). Interestingly, the same paradigm as (2) cannot be produced in Japanese, as evidenced in (4) below.

(4) a. John-ga sasimi-o tabe-ta.
John-NOM raw fish-ACC eat-PAST
'John ate raw fish.'
b. *Bill-mo [$_{vP}$ e] si-ta.
Bill-also do-PAST
'Bill did, too.'

If V (or more exactly the [V-v] verbal complex) remains in situ in Japanese as in English, the following derivation in (5) should be theoretically possible for (4b) (see Kuroda, 1965 and Kubo, 1992 *inter alia.* for *su/si*-support, an analogue of *do*-support in Japanese).[6)]

(5) a. [$_{TP}$ John-ga$_i$ [$_{vP}$ t$_i$ sasimi-o tabe]-ta]
b. [$_{TP}$ Bill-mo$_i$ ~~[$_{vP}$ t$_i$ sasimi-o tabe]~~ si-ta] (← *su/si*-support)[7)]

In (5b), the vP portion has been elided by the PF-deletion for VP-ellipsis, accompanied by *su/si*-support to save the stranded affixal T, in the phonological component on a par with (3b). As such, (4b) is expected to be acceptable under the assumption that the [V-v] complex stays in situ in Japanese, contrary to fact.

Therefore, as long as we maintain that main verbs remain in situ in vP in Japanese, the lack of GVPE in Japanese should remain as a real puzzle to be provided with a principled explanation in linguistic theory.

2.2 Hoji (1998): Arguments against the Existence of VPEID in Japanese

It is well-known that GVPE in English gives rise to ambiguity with respect to its interpretation between the sloppy identity reading and the strict identity reading (cf. Sag, 1976; Williams, 1977 *inter alia.*), as illustrated in (6) below.

(6) a. John threw out his letters.
b. Mary did [$_{vP}$ e], too.
= Mary$_i$ threw out her$_i$ letters, too. (= sloppy identity reading)

= Mary threw out John's letters, too. (= strict identity reading)

Otani and Whitman (1991) pointed out that basically the same paradigm obtains in Japanese, as shown in (7) below, and made the point that (7b) should be analyzed as involving VPEID.[8)]

(7) a. John-wa [zibun-no tegami-o] sute-ta.
John-TOP self-GEN letter-ACC discard-PERF
'John$_i$ threw out self$_i$'s letters.'
b. Mary-mo [e] sute-ta.
Mary-also discard-PERF
= 'Mary$_j$ also threw out self$_j$'s letters.' (= sloppy identity reading)
= 'Mary also threw out John's letters.' (= strict identity reading)
(= Otani and Whitman, 1991: 346-347, (4))

In line with Huang's (1988, 1991) analysis of the Chinese analogue, Otani and Whitman (1991) claimed that the apparent sloppy identity reading in (7b) arises due to overt raising of a main verb to T out of vP that contains a null object [e], which results in an "empty vP" in Japanese on a par with (6b) in English, as depicted in (8) below.[9)]

(8) [$_{TP}$ Mary-mo [$_{vP}$ [e] t_i] sute$_i$-ta]

According to Otani and Whitman's (1991) V-raising hypothesis, the "empty vP" in (8) is taken to be derived by the combination of the following two factors: (i) the licensing conditions for generating a null object [e]; (ii) the overt V-raising to T out of vP.

However, on the basis of solid empirical grounds, Hoji (1998) demonstrated that the construction such as (7b) in Japanese should not be analyzed as an instance of VPEID.

First, Hoji (1998) paid attention to the fact that, while GVPE in English can yield a sloppy identity interpretation in the environment where a quantified subject is involved, the null object construction in Japanese cannot yield such an interpretation in such an environment, as illustrated by the contrast in the paradigms between (9)-(10) and (11)-(12) below.

(9) A: Every Japanese couple consoled each other.

B: Every American couple did, too.

(= Hoji, 1998: 131, (16))

(10) Every American couple consoled each other, too.

(11) A: Subete-no nihonzin huuhu-ga otagai-o nagusame-ta.
all-GEN Japanese couple-NOM each other-ACC console-PAST
'Every Japanese couple consoled each other (i.e., for each Japanese couple, the husband and the wife consoled each other).'

B: Subete-no amerikazin huuhu-mo nagusame-ta.
all-GEN American couple-also console-PAST
'Every American couple consoled ec, too.'

(= Hoji, 1998: 131, (14))

(12) Subete-no amerikazin huuhu-mo otagai-o nagusame-ta.
all-GEN American couple-also each other-ACC console-PAST
'Every American couple consoled each other, too (i.e., for each American couple, the husband and the wife consoled each other).'

(= Hoji, 1998: 131, (15))

The GVPE in (9B) can be interpreted as in (10), whereas the null object construction in (11B) can never be interpreted as in (12).

Second, Hoji (1998) also observed that, although the GVPE in English exhibits locality effects on the sloppy identity reading (Williams, 1977), the null object construction in Japanese does not induce such locality effects, as shown by the contrast between (13)-(14) and (15) below.

(13) #John$_i$ recommended his$_i$ student, but (since) Mary thought that Bill did [$_{vP}$ e], (she did not do anything (about recommending her own student)).

(= adapted from Hoji, 1998: 137, (32))

(14) a. Mary thought that Bill$_j$ recommended his$_j$ student.
b. Mary$_k$ thought that Bill recommended her$_k$ student.

(15) John$_i$-wa zibun$_i$-no gakusei-o suisensi-ta.
John-TOP self-GEN student-ACC recommend-PAST
'John$_i$ recommended self$_i$'s student.'
(Demo) Mary$_j$-wa [$_{CP}$ Bill-ga [e] suisensi-ta to] omottei-ta. (Dakara [e]$_j$
(but) Mary-TOP Bill-NOM recommend-PAST COMP think-PAST (so
zibun de-wa nani-mo si-nakat-ta.
on her part anything do-NEG-PAST)
'(But) Mary$_j$ thought that Bill recommended [e] (= her$_j$ student) and so she

did not do anything herself.'

(= adapted from Hoji, 1998: 136, (30A) and 137, (31))

In (13), *Mary thought that Bill did* $[_{vP}$ *e]* can mean (14a) but it cannot mean (14b), indicating that the sloppy identity reading in (13) forces a pronominal variable to be locally bound by the embedded subject.

On the other hand, the null object construction in (15) can have the non-local "sloppy-like" reading corresponding to (14b) unlike the GVPE in English in (13). Accordingly, to the extent that Hoji's (1998) demonstration above is valid, the null object construction in Japanese is not an instance of VPEID (nor GVPE for that matter). Based on other considerations as well, Hoji (1998) concluded that the null object construction in Japanese is a construction where a regular null object in Japanese is employed, without involving a vP-anaphora and that Otani and Whitman's (1991) arguments for overt V-raising in Japanese loses its empirical support[10] Notice, however, that, even if Hoji's (1998) conclusion that the null object construction in Japanese is not an instance of VPEID is correct, which I also certainly concur with, the accompanying suggestion that Japanese lacks overt V-raising *per se* cannot answer the fundamental question as to why Japanese lacks VPEID as well as GVPE in the first place.[11]

3. Deriving the Lack of VP-ellipsis in Japanese

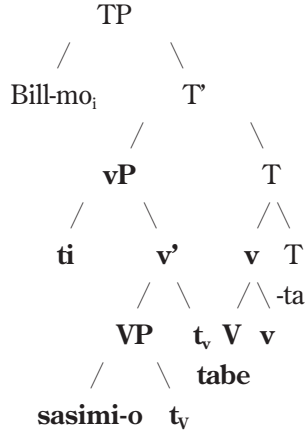
3.1 Lack of GVPE and Overt Movement of the Verbal Complex [V-v] to T

In this section, I will contend that the puzzle concerning the lack of GVPE in Japanese can in fact receive a rather straightforward explanation under the PF-deletion approach to VP-ellipsis, if the verbal complex [V-v] undergoes overt raising to T in Japanese, as originally claimed by Otani and Whitman (1991).

Suppose that V overtly raises to T via v in Japanese.[12), 13)] Then, (16b) (= (4b)) would be assigned the structure in (17) below in overt syntax prior to PF-deletion for the putative GVPE and *su/si*-insertion at T in the phonological component.

(16) a. John-ga sasimi-o tabe-ta.
John-NOM raw fish-ACC eat-PAST
'John ate raw fish.'
b. *Bill-mo $[_{vP}$ e] si-ta.
Bill-also do-PAST
'Bill did, too.'

(17)



Notice that in order to derive the putative GVPE in Japanese, the bold-faced portion in (17) has to be elided at PF, triggering *su/si*-support to rescue the stranded affixal T *-ta*. Crucially, however, the relevant bold-faced portion in (17) does not make up a syntactic constituent at all as a result of overt V-raising to T via v. Under the standard assumption, a PF-deletion operation cannot be applied to such a non-constituent string to yield GVPE. Hence, the impossibility of GVPE in Japanese naturally falls into place. This kind of simple account of the lack of GVPE in Japanese is only available, if V is overtly raised to T via v before application of the PF-deletion for VP-ellipsis in this language, other things being equal.

Note in passing that the present account makes a prediction that if overt V-raising in (17) is somehow rendered unavailable, the *su/si*-support strategy would become effective in Japanese. This prediction indeed seems to be borne out, as exemplified in (18) below.

(18) Bill-ga sasimi-o tabe-mo si-ta.
Bill-NOM raw fish-ACC eat-also do-PAST
'Bill also ate raw fish.'

In (18), overt V-raising to T via v is blocked due to the presence of a focus particle *mo* 'also' attached to vP/VP (see Kuroda, 1965; Aoyagi, 1998, 1999, 2006 *inter alia.* for discussion on this construction in Japanese in connection with *su/si*-support). Hence, *su/si*-insertion to rescue the stranded affixal T *–ta* has been obligatorily applied to yield the surface form in (18).

3.2 Lack of VPEID and Overt Movement of the Verbal Complex [V-v] to T

As shown in section 3.1, the lack of GVPE in Japanese can be provided with a straightforward account under the assumption that overt V-movement to T via v takes place in NS in Japanese in general. By contrast, the very existence of overt V-to-v-to-T movement *per se* does not explain away why Japanese lacks VPEID as well, as it stands.

In order to solve this problem, I would like to address a quite intriguing descriptive generalization originally entertained (but eventually rejected) by Lasnik (1999), reviving it in the context of PF economy considerations under the copy theory of movement in the MP. In closely examining the linguistic phenomena of GVPE and pseudogapping in English, Lasnik (1999) considers the possibility that a descriptive generalization as in (19) might hold in natural language with respect to ellipsis in general including VP-ellipsis.[14)]

(19) XP ellipsis is prohibited if XP has lost its head [as a result of overt movement of X– the author]. (= his (57))

If (19) holds for VP-ellipsis, then (19) indicates that VP-ellipsis (or more accurately vP-ellipsis) is prohibited if vP has lost its head [V-v] as a result of overt movement of [V-v] to T in NS. Although Lasnik (1999) himself immediately retracted from (19) on the basis of the fact that Hebrew (Doron, 1999), Portuguese (Martins, 1994), and Irish (McCloskey, 1991) allow for VPEID while they apparently do not meet the restriction in (19).

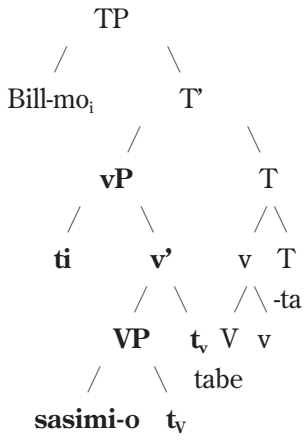
However, since there is a possibility that a different analysis could be entertained for those languages, as suggested in the next section, let us just presume for the moment that Lasnik's (1999) constraint on ellipsis in (19) is valid and proceed to the task of providing an analysis of the lack of VPEID in Japanese in light of (19).

Contrary to fact, suppose (20b) could be analyzed as involving VPEID in Japanese.[15)]

(20) a. John-ga sasimi-o tabe-ta.
John-NOM raw fish-ACC eat-PAST
'John ate raw fish.'
b. Bill-mo tabe-ta.
Bill-also eat-PAST
'Bill did, too.'

Then, the putative representation would look something like (21) prior to the PF deletion of vP to yield VPEID in Japanese.

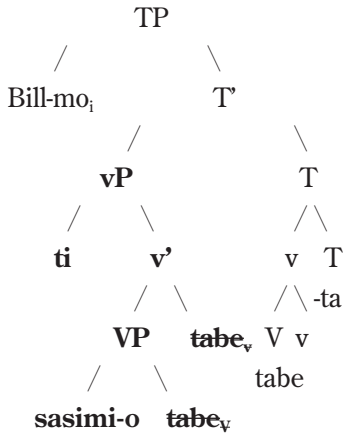
(21)



It is to be noted that if Lasnik's (1999) constraint on ellipsis in (19) is correct, then the PF deletion of the bold-faced vP in (21) would be correctly excluded, due to the fact that the head [V-v] of the vP to be elided for VPEID has been "lost" by overt movement of [V-v] to T in Japanese. Hence, the lack of VPEID in Japanese follows in a principled manner by appealing to the constraint in (19).

Given that Lasnik (1999) himself put forth the constraint on ellipsis in (19) as just a descriptive generalization, one might wonder about its status within the organization of the grammar if it is valid at all. First of all, under the copy theory of movement in the current MP, (21) is to be more accurately depicted as in (22) (the lower copy of the subject is represented as a trace since it is orthogonal to the present discussion).

(22)



As Nunes (1999, 2004) argues, in normal cases, all but one link of a chain must be deleted by the operation *Chain Reduction* in order to produce an appropriate linear order in accordance with the LCA (cf. Kayne, 1994; Chomsky, 1995).[16] As illustrated in (22), on this assumption, the lower copy of overt [V-v]-movement to T is deleted by Chain Reduction.

If Lasnik's (1999) constraint on ellipsis in (19) has any empirical content, it should be derived from something "deeper" related to the nature of the FL. If PF deletion operations are in general also functioning by referring to the nature of the label of a constituent to be elided, Lasnik's (1999) constraint in (19) seems to make good sense in terms of PF economy considerations in the phonological component after Transfer. Note that, according to (19), XP has "lost" its head as a result of overt movement of the head X. Thus, in the case of VP-ellipsis, it would mean that vP will lose its head v (or more accurately $[_v$ V-v]), as a result of overt movement of [V-v] to T. If the lower copy of the overt [V-v]-movement to T must be independently deleted by Chain Reduction without any other choice, it would be rather computationally redundant if VP-ellipsis would delete the [V-v] head again as a subpart of the PF-deletion operation of vP.

If the phonological component of the FL is designed in an optimal fashion as well, this kind of redundancy should be excluded from the FL from the perspective of the MP. Hence, the lack of vP-ellipsis for VPEID when overt [V-v]-movement to T occurs, due to the environment for Lasnik's (1999) constraint on ellipsis in (19).

I would like to claim that Lasnik's (1999) constraint on ellipsis in (19) is a specific consequence of the following natural principle of efficient computation for C_{HL} as it comes into play in the phonological component.

(23) Principle of Efficient Computation:[17]
Any inefficient computation is illicit throughout the derivational course of C_{HL}.

Now, before moving on to the next section, a remark about the timing of Chain Reduction and PF-deletion for VP-ellipsis in connection with Lasnik's (1999) constraint on ellipsis in (19) is in order. I will put forth the following computational ordering with respect to relevant operations in the phonological component also in line with the principle of efficient computation in (23).

(24) (i) Check whether Chain Reduction has no choice but to delete a specific link of a chain due to some morphophonological reasons.
↓

(ii) a. If yes, then apply Chain Reduction without any delay. If the result leads to the constraint in (19), then VP-ellipsis would be blocked. If not, VP-ellipsis would not be blocked.

b. If no, delay Chain Reduction until later. If there is no environment for the constraint in (19), VP-ellipsis could be applied. If applied, Chain Reduction would be blocked due to (23). If not applied, Chain Reduction would delete all but one chain link in accordance with the minimization of Formal Feature Elimination (FF-Elimination) in Nunes (1999, 2004).[18)]

Now, given that overt [V-v]-movement to T in Japanese should be regulated by the computation in (24), a question immediately arises as to why Japanese always deletes the lower link of an overt [V-v]-movement to T to create an environment for Lasnik's (1999) constraint on ellipsis in (19), banning vP-ellipsis for VPEID.[19)] For the sake of argument, suppose, instead, that the upper link of an overt [V-v]-movement to T were deleted at PF. Then, in order to meet the morphosyntactic requirement of the tense affix *–ta* 'PAST' in T, something like Phonological/Morphological Merger or Affix Hopping had to be invoked so that the verbal complex [V-v] and the stranded tense affix in T could be "reunited" in the phonological component. Nevertheless, if the verbal complex [V-v] always overtly moves to T and the lower link of the [V-v]-movement is deleted at PF by Chain Reduction in Japanese, this kind of additional operation would not have to be invoked in the first place.

If (23) holds true, it is expected that the C_{HL} in the phonological component would not sanction any operation which would lead to destroying verbal morphology which has already been established in NS. Otherwise, the destroyed verbal morphology would have to be "fixed" in the phonological component, which would go against the nature of the general principle of efficient computation of C_{HL} in (23).

Based on these considerations, I would like to maintain that the illicitness of the pattern of the upper copy deletion of the overt [V-v]-movement to T by Chain Reduction in Japanese is another consequence of the natural principle of efficient computation in (23) above as it is at work in the phonological component.

If the above reasoning is not off the mark, the lack of VPEID in Japanese falls into place, given that the head of the vP to be elided will be deleted at PF due to Chain Reduction, creating the very environment for Lasnik's (1999) constraint in (19), which would ban vP-ellipsis, as desired.

4. Some Consequences to the Typology of (Un)availability of VP-ellipsis

In the preceding section, I couched principled reasons why Japanese lacks both GVPE and VPEID. In this section, I will extend the empirical domain of investigation to (un)availability of VP-ellipsis in French, German, English, Chinese, Hebrew, Portuguese and Irish, with a view to pursuing some consequences of my analysis of Japanese in a cross-linguistic setting in connection with a theory of verbal morphology.

4.1 Typology of (Un)availability of VP-ellipsis

First, French and German allow for neither GVPE nor VPEID on a par with Japanese, as illustrated in (25)-(28) below (see Lobeck, 1995, chap.5 for the GVPE data in French and German).

(25) French (GVPE)

a. *Claudine est une bonne étudiante, et Marie est [$_{vP}$ e] aussi.
Claudine is a good student and Mary is too
'Claudine is a good student, and Mary is, too.'

b. *On a demandé si ils ont déjà mange, et ils ont [$_{vP}$ e].
we asked if they had already eaten, and they had
'We asked if they had already eaten, and they had.'

c. *On peut demandé si ils ont déjà mange, et on doit [$_{vP}$ e].
one can ask if they have already eaten, and one shoud
'One can ask if they have already eaten, and one should.'
(= adapted from Lobeck, 1995: 158,(42))

(26) French (VPEID)

*Claudine mange du pain, et Marie mange [$_{vP}$ e] aussi.

(27) German (GVPE)

a. *Hans wird heimfahren und Maria wird [$_{vP}$ e] auch.
Hans will drive home and Maria will too
'Hans will drive home, and Maria will, too.'

b. *Hans hat geschlafen und Peter hat [$_{vP}$ e] auch.
Hans has slept and Peter has too
'Hans has slept, and Peter has, too.'

c. *Maria ist ins Kino gegangen und Peter ist [$_{vP}$ e] auch.

Maria is to the theater gone and Peter is too
'Maria has gone to the movies, and Peter has, too.'
(= adapted from Lobeck, 1995: 158,(43))

(28) German (VPEID)
*Hans spricht Deutsch und Peter spricht [$_{vP}$ e] auch.

Second, English and Chinese permit GVPE but do not permit VPEID, as shown in (29)-(32) (see Liejiong, 2003 for the GVPE and VPEID data in Chinese).

(29) English (GVPE)
a. John has eaten raw fish, and Mary has [$_{vP}$ e], too.
b. John is a good student, and Mary is [$_{vP}$ e], too.

(30) English(VPEID)
*John threw out his letters, and Mary threw out [$_{vP}$ e] as well.

(31) Chinese (GVPE)
John xihuan tade mama, Bill ye shi.
John like his mother Bill also be
'John likes his mother, and Bill does as well.'

(32) Chinese (VPEID)
*John kanjian-le tade mama, Bill ye kanjian-le.[20]
John saw his mother Bill also saw
'John saw his mother, and Bill did as well.'

Thirdly, Hebrew apparently does not allow for GVPE but only allows for VPEID, as exemplified in (33) (see Doron, 1999 for the Hebrew data):[21]

(33) Hebrew (VPEID)
dani ohev et iSt-o aval moSe sone
Dani loves ACC wife-his but Moshe hates
'Dani loves his wife but Moshe hates his wife.'

Finally, Portuguese and Irish permit both GVPE and VPEID, as evidenced in (34)-(37) below (see Martins, 1994 for the Portuguese data and McCloskey, 1990 for the Irish data).

(34) Portuguese (GVPE)
O João está a ler esse romance e a Marta também está.

the John is reading that novel and the Martha also is
'John is reading that novel and Martha is too.'

(35) Portuguese (VPEID)
A Marta deu um livro ao João?—Sim, deu.
the Martha gave a book to-the John yes gave
'Did Martha give a book to John? Yes, she did.'

(36) Irish (GVPE)
Shil an Taoiseach go raibh an toghachán buaite
thought the Prime Minister COMP was the election won
aige agus shíl an tUachtarán fosta go raibh
by-him and thought the President also COMP was
'The Prime Minister thought that he had won the election and the President also thought that he had.'

(37) Irish (VPEID)
Dúirt siad go dtiocfadh siad ach ní dóigh liom
said they COMP come [CONDIT] they but I-don't-think
go dtiocfaidh.
COMP come [FUT]
'They said they would come, but I don't think they will.'

In summary, the patterns of (im)possibility of GVPE and VPEID among Japanese, French, German, English, Chinese, Hebrew, Portuguese and Irish can be depicted in (38) below.

(38) a. Japanese/French/German: ×GVPE, ×VPEID
b. English/Chinese: ✓GVPE, ×VPEID
c. Hebrew: ×GVPE, ✓VPEID
d. Portuguese/Irish: ✓GVPE, ✓VPEID

In the next section, I will make an attempt to provide principled accounts for the relevant patterns in (38) in connection with a theory of verbal morphology.

4.2 Deriving the Typological Patterns in Question

4.2.1 UG-licensed Three Types of Processes for Verbal Morphology

With the intention of deriving the typological patterns of (im)possibility of VP-ellipsis (= GVPE and VPEID) in (38), I would like to advocate a theory of verbal morphology which claims that verbal morphology in natural language is

implemented by adopting one or two of the following UG-licensed three types of processes formulated in (39) (under the assumption that overt V-to-v movement is universal, following Chomsky, 2001b, 2004, 2007).[22)]

(39) UG-licensed Three Types of Processes for Verbal Morphology
  a. an affixal T is lowered to (= affix-hopped to) a bare verbal element
  b. a bare verbal element is raised to an affixal T
  c. a fully inflected verbal element is raised to a non-affixal T

The operation in (39a) roughly corresponds to Affix Hopping in Chomsky (1957), but, here, following Marantz (1988, 1989), Halle and Marantz (1993), and Bobaljik (1995) among others, I will assume that the affixal T-lowering/affix-hopping in (39a) is a morphophonological rule (= morphological merger/PF-merger) applying under adjacency in the phonological component, leaving behind no copy (see also Lasnik, 1981, 1995 for the idea that Affix Hopping is just a low level process of regrouping of an adjacent affix and a verb). Thus, there is no lowering operation for verbal morphology in narrow syntax proper.

In contrast, both of the processes in (39b) and (39c), viz., raising of a bare verbal element to an affixal T and raising of a fully inflected verbal element to a non-affixal T, respectively, are narrow syntactic processes which leave behind copies.[23), 24)] Basically, the operation in (39b) corresponds to the Baker-style "building" theory of verbal morphology via incorporation (cf. Baker, 1988), while the one in (39c) to the Chomsky-style "checking" theory of verbal morphology, modulo the elimination of the covert cycle (cf. Chomsky, 1993, 1995; Chomsky and Lasnik, 1993).[25)]

4.2.2 Verbal Morphology-based Accounts

Recall from section 4.2.1 the cross-linguistic patterns of (un)availability of GVPE and VPEID in (38) and the UG-licensed three types of processes for verbal morphology in (39), which are reproduced as (40) and (41) below for ease of reference.

(40) a. Japanese/French/German: ×GVPE, ×VPEID
  b. English/Chinese: ✓GVPE, ×VPEID
  c. Hebrew: ×GVPE, ✓VPEID
  d. Portuguese/Irish: ✓GVPE, ✓VPEID

(41) UG-licensed Three Types of Processes for Verbal Morphology
  a. an affixal T is lowered to (= affix-hopped to) a bare verbal element
  b. a bare verbal element is raised to an affixal T
  c. a fully inflected verbal element is raised to a non-affixal T

First of all, if my analysis of Japanese in section 3 is on the right track, it must be the case that Japanese opts for the choice in (41b). Thus, a bare verbal element [V-v] overtly raises to the affixal T and the lower copy of the overt [V-v]-movement to T must be deleted by Chain Reduction, since the upper copy of the overt [V-v]-movement to T must remain for the morphophonological interpretation of the complex [V-v-T] in the phonological component, in compliance with the condition on efficient computation for C_{HL} in (23) (see the discussion in section 3.2). Accordingly, in the case of Japanese, GVPE is unavailable due to the impossibility of targeting a non-constituent for vP-ellipsis, as mentioned in section 3.1, nor is VPEID possible by virtue of Lasnik's (1991) constraint on ellipsis in (19).

By the same token, if French and German fall under the same group as Japanese as shown in (40a), it entails that French and German also select the choice in (41b). As such, in French and German, both main verbs and auxiliary verbs are merged as bare verbal stems "at the base" and are overtly raised to the affixal T, with the lower copy of overt [V-v]/Aux-movement to T being deleted by Chain Reduction for a morphophonological reason on a par with Japanese (see Lasnik, 1995 for a different view).

If this is the case, the lack of VPEID in French and German can be accounted for on a par with Japanese in terms of Lasnik's (1991) constraint on ellipsis in (19), since main verbs will always move overtly to T in the absence of auxiliary verbs in French and German. On the other hand, the explanation for the lack of GVPE in French and German seems to be more convoluted. Note that, under the standard assumption that GVPE will target vP, which includes a main verb but excludes an auxiliary verb, it is rather difficult to account for the fact at stake in French and German, since main verbs should stay within vP in the presence of auxiliary verbs in French and German (cf. Emonds, 1978; Pollock, 1989; Chomsky, 1991 for French verbal morphology).

One possible way out of this dilemma is to give up the standard assumption for GVPE that GVPE elides vP to the exclusion of an auxiliary verb when an auxiliary verb occurs, as represented in (42), and instead to assume that what is to be deleted for GVPE is the maximal projection AuxP headed by (a copy of) an auxiliary verb when it exists, as roughly sketched in (43) (the lower copy of Aux is indicated by a

trace):

(42) $[_{TP} \ldots \text{T+Aux} [_{AuxP} t_{Aux} [_{vP} \ldots [_{VP} \ldots]]]]$
(43) $[_{TP} \ldots \text{T+Aux} \cancel{[_{AuxP} t_{Aux} [_{vP} \ldots [_{VP} \ldots]]]}]$

It is to be noticed that, if (43) is correct and auxiliary verbs in French and German are of the type in (41b) on a par with their main verbs, it is correctly predicted that GVPE is impossible in French and German. This is because the lower copy of the Aux-movement to T must be deleted by Chain Reduction for the now familiar morphophonological reason, which would create the very environment for the ban on ellipsis dictated in (19).

Secondly, the fact that English and Chinese permit GVPE but not VPEID suggests that they employ the option in (41a) for main verbs and the option in (41c) for auxiliary verbs. In English and Chinese, since T's affix hops onto a bare [V-v] main verb which stays within vP in a non-ellipsis context, the vP can be successfully elided to yield GVPE, with *do*-support in English and its Chinese analogue applying to save the stranded affixal T in a vP-ellipsis context. Furthermore, when an auxiliary verb occurs, since a fully inflected Aux is raised overtly to T in English and Chinese, in principle, there is no morphophonological reason to delete either one of the chain links in particular. As such, at the point of derivation where the PF-deletion operation for VP-ellipsis applies, both the upper copy and the lower one remain, in accordance with the computational ordering in the phonological component in (24) in section 3. Consequently, the AuxP-deletion in (43) successfully applies and derives GVPE. By contrast, since both English and Chinese do not overtly raise main verbs (as theta-role assigners) to T, they naturally lack VPEID.[26)]

In this vein, it is interesting to consider the case of VP-ellipsis in English involving a copular *be* in relation to my theory of VP-ellipsis. Lasnik (2003) claims that VP-ellipsis involving an auxiliary verb *be/have* in English is parallel to the VPEID in Hebrew, Portuguese, and Irish, citing the following example in (44).

(44) John was here and Mary was too.
(Lasnik, 2003:106,(16))

However, strictly speaking, a copular *be* is not a main verb in the sense that it does not assign any theta-role to anything (see Baker, 2003 and references cited therein *inter alia.*). Thus, if the copular *be* in English is an instance of Aux rather than a main verb, then (44) should not be an example of VPEID in the relevant

sense.

Under Lasnik's (2003) assumption that the finite form *was* of the auxiliary verb *be* is inserted as a fully inflected form *was* and undergoes movement to T, the following structure in (45) would be derived before PF-deletion.

(45) $[_{TP}$ John $[_{T'}$ was $[_{vP}$ was here$]]]$ and $[_{TP}$ Mary $[_{T'}$ was $[_{vP}$ was here$]$ too.

Given this, the following structure in (46) would be generated instead of (45) prior to PF-deletion (the lower copies of the two subjects of small clauses indicated by […] are depicted by traces).

(46) $[_{TP}$ John$_i$ $[_{T'}$ was $[_{AuxP}$ was $[t_i$ here$]]]]$ and $[_{TP}$ Mary$_j$ $[_{T'}$ was $[_{AuxP}$ was $[t_j$ here$]]]]$ too.

With respect to morphophonology of the fully inflected Aux form *was*, there is no particular reason why one of the two links of the Aux-chain must be deleted over another. Thus, under my theory, in compliance with the computational ordering in the phonological component in (24) in section 3, Chain Reduction will wait until the PF-deletion of the AuxP applies in the second conjunct for VP-ellipsis, which would render the AuxP of the second conjunct phonologically silent, as represented in (47) (the lower copy of the fully inflected Aux *was* in the first conjunct is deleted by Chain Reduction).

(47) $[_{TP}$ John$_i$ $[_{T'}$ was $[_{AuxP}$ was $[t_i$ here$]]]]$ and $[_{TP}$ Mary$_j$ $[_{T'}$ was ~~$[_{AuxP}$ was $[t_j$ here$]]]$~~ too.

It is to be noted that, although Chain Reduction applies to the first conjunct, it does not apply to the second conjunct in virtue of the principle of efficient computation in (23), since the application of the PF-deletion for VP-ellipsis in the second conjunct in (47) had already turned the lower copy of the Aux *was* phonologically silent by PF-deletion. If this is the case, (44) does not pose any problem to my theory of VP-ellipsis in this article.[27] The same reasoning should hold for the auxiliary verb *have* in English with respect to VP-ellipsis *mutatis mutandis*.

Thirdly, in the case of Hebrew, given that GVPE does not exist while VPEID does, it must be the case that the language is devoid of the English-type Aux which licenses GVPE (see also Goldberg, 2005) on a par with Japanese, and it takes the option in (41c) for main verbs. Accordingly, because there is no particular

morphophonological reason to delete either one of the chain links of the fully inflected main verb to be overtly moved to T, at the point of derivation where the PF-deletion operation for VP-ellipsis applies, both the upper copy and the lower one remain in accordance with the computational ordering in the phonological component in (24) in section 3. As a result, the vP-deletion applies successfully to produce VPEID in Hebrew, as expected.

Finally, the fact that Portuguese and Irish allow for both GVPE and VPEID indicates that they more likely than not employ the option in (41c) for both main verbs and auxiliary verbs. Therefore, if an auxiliary verb is present, it would overtly raise to T as a fully inflected element; whereas, if it does not occur, a fully inflected main verb would raise overtly to T. In either case, there is no special morphophonological reason to delete either one of the chain links of the fully inflected auxiliary verb/main verb to be overtly moved to T at the point of its relevant derivation. As a result, in conformity with the procedure in (24), AuxP-deletion and vP-deletion would apply to yield GVPE and VPEID, respectively, without any difficulty in Portuguese and Irish.

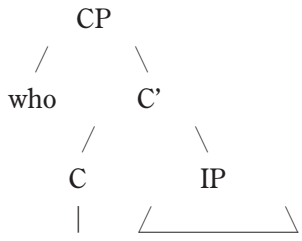
Before closing this section, I would like to touch upon a related linguistic phenomenon which seems to provide further empirical support to my theory of VP-ellipsis. If Lasnik's (1999) restriction on ellipsis in (19) holds in general, it is expected that Sluicing, or IP-ellipsis, also behaves in the same manner.[28] Indeed, this expectation is fulfilled, as observed by Lasnik (1999) and Merchant (2001). Witness the following paradigms in (48)-(49).

(48) a. Who has Max invited? [English]
b. Wen hat Max eingeladen? [German]
c. Wie heeft Max uitgenodigd? [Dutch]
d. Hvem har Max inviteret? [Danish]
(= Merchant, 2001:63,(72))

(49) a. A: Max has invited someone. B: Really? Who (*has)? [English]
b. A: Max hat jemand eingeladen. B: Echt? Wen (*hat)? [German]
c. A: Max heeft iemand uitgenodigd. B: Ja? Wie (*heeft)? [Dutch]
d. A: Max har inviteret en eller anden. B: Ja? Hvem (*har)? [Danish]
(= Merchant, 2001:63,(74))

In the matrix *wh*-interrogatives in (48), overt I-to-C movement has taken place, putting an Aux element at C, as illustrated by the English example in (49a) and represented in (50) below, for instance.

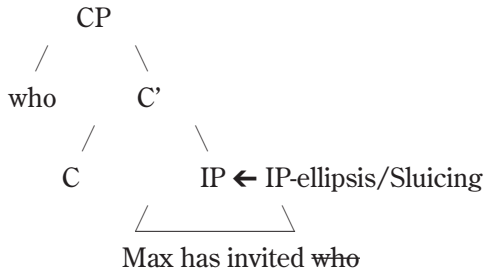
(50)



(= adapted from Merchant, 2001:63,(73))

Note that, if the Subject-Aux Inversion in (50) signifies that the lower copy of the Aux-movement has to be obligatorily deleted by virtue of some property of C, the result would lead to the very environment for Lasnik's (1991) constraint on ellipsis in (19). Hence the unacceptable IP-ellipsis, or Sluicing, like * *Who has?* in (49a). Thus, the appropriate sluice *Who?* in (49a) indicates that the Subject-Aux Inversion in fact has not occurred, as depicted in (51).

(51)



Notice that the IP-deletion operation for Sluicing in (51) does not run afoul of Lasnik's (1999) constraint on ellipsis in (19), since the head I of the IP has not been "lost" by I-to-C movement. In a nutshell, the fact in (49a) can be brought to bear upon my theory of VP-ellipsis via the generality of the constraint on ellipsis in (19).

5. Some Theoretical Implications

In this section, I will briefly consider some theoretical implications of my theory of VP-ellipsis pertaining to the issues concerning the distinction between Chain Reduction (= PF-deletion of chain links) and PF-deletion for VP-ellipsis, and the status of overt movement of a verbal element in linguistic theory.

5.1 Chain Reduction (= PF-deletion of chain links) and PF-deletion for VP-ellipsis

Nunes (1999, 2004) claims that Chain Reduction (= PF-deletion of chain links) and PF-deletion for VP-ellipsis are different PF-processes, contra Chomsky (1993). If my analysis of VP-ellipsis in this article is on the right track, the condition which determines applicability of the PF-deletion for VP-ellipsis and the one which specifies possible patterns of PF-deletion of chain links by Chain Reduction are independent of each other. As such, this in turn seems to imply that Nunes's (1999, 2004) position is valid.

5.2 Overt Movement of a Verbal Element

In the current theorizing of the minimalist program (MP), there remains a theoretically significant problem unsettled as to whether overt movement of a verbal element belongs to the narrow syntax (NS) proper or to the phonological component after Spell-Out/Transfer (cf. Chomsky, 2001a,b; Zwart, 2001; Matushansky, 2006 *inter alia*.). In this article, I have demonstrated that the (im)possibility of GVPE and VPEID is to be explained away in a principled manner by the interaction of the presence/absence of Aux elements and overt movement of verbal elements to T and the different patterns of copy deletion in accordance with the computational ordering in the phonological component in (24) in section 3. If this line of analysis is not off the mark, it seems to suggest that overt movement of a verbal element such as [V-v]/Aux has to belong to NS, since it must leave behind its copy on a par with other movements in NS.[29)]

6. Conclusion

In this article, I argued that the fact that Japanese lacks both GVPE and VPEID can be readily accounted for by hypothesizing that the language in fact involves overt V-raising to T via v, as originally claimed by Otani and Whitman (1991), while still maintaining the validity of Hoji's (1998) analysis of the null object construction in Japanese, by adopting the PF-deletion approach to VP-ellipsis under the copy theory of movement in the MP. Furthermore, by developing the idea of UG-licensed three types of processes for verbal morphology, I demonstrated that my analysis of Japanese can be naturally extended to accommodate cross-linguistic typological variations with respect to (un)availability of GVPE and VPEID on the basis of data from Japanese, French, German, English, Chinese, Hebrew, Portuguese and Irish. I also drew some theoretical implications of my theory of VP-ellipsis pertaining to

the issues concerning the distinction between Chain Reduction (= PF-deletion of chain links) and PF-deletion for VP-ellipsis, and the status of overt movement of a verbal element in linguistic theory.

Notes

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1) I use the following abbreviations in glossing: ACC-accusative case, COMP-complementizer, CONDIT-conditional, DAT-dative case, FUT-future tense, GEN-genitive case, NEG-negation, NOM-nominative case, PAST-past tense, PERF-perfective aspect, TOP-topic marker.

2) There is too much literature to mention here on the topic of VP-ellipsis. See also Sag (1976), Williams (1977), Kitagawa (1991), Fiengo and May (1994), Lobeck (1995, 1999), Zagona (1982, 1988a,b) among many others. See Johnson (2001) for a concise review of the past representative works on VP-ellipsis.

3) In section 4.2, I will propose that what is to be elided in the case of GVPE can be an AuxP rather than a vP when an auxiliary verb occurs, contra the standard assumption in the literature. But, until section 4.2, I will describe GVPE as uniformly involving elision of vP in what follows. Also, I will employ the term *VP-ellipsis* as a cover term when the categorial identification of an ellipsis site is not particularly crucial for discussion.

4) Kitagawa (1999) also argues that Japanese does not have VPEID and the relevant construction discussed by Otani and Whitman (1991) should be analyzed as involving NP-ellipsis under the LF-copying mechanism rather than the PF-deletion mechanism. In addition, Kitagawa (1999) convincingly shows that λ-abstraction is inadequate in capturing both the sloppy identity reading and the locality effects in VP-ellipsis, contra Williams (1977).

5) In this article, I will assume with Merchant (2001, 2004) without arguments that VP-ellipsis (or ellipsis in general, for that matter) is implemented via the E feature under the PF-deletion approach.

6) For the sake of argument, I will assume here that the subject is overtly moved to [Spec,TP] from [Spec,vP] in Japanese as well, following Hasegawa (2005) and Miyagawa (2005). The argument below is not affected with some modification of the ellipsis site for the putative VP-ellipsis, even if the subject remains at [Spec,vP] throughout the derivation, as argued in some version of the predicate internal subject hypothesis in Japanese (Kitagawa, 1986; Fukui, 1986; Kuroda, 1988 *inter alia.*).

7) One might claim that the surface string *Bill-mo si-ta* in (5b) after the PF-deletion seems to sound OK in Japanese. It is to be noted, however, that such an acceptable interpretation is different from the unacceptable one in (4b) in that the former involves a main verb *su/si* 'do', which crucially implicates agentivity. Thus, it should be clearly distinguished from the case of the dummy verb *su/si* 'do' in *su/si-*

support in Japanese, which lacks such an agentivity implication.

8) Recall that the only difference between GVPE and VPEID is that, while an auxiliary verb (including a dummy verb) remains in the former, a main verb is left in the latter (see Goldberg, 2005 for details).

9) Crucially, following Williams (1977), Otani and Whitman (1991) assume that the content of the antecedent vP is copied onto the site of the null vP at LF via a λ-expression. However, if Chomsky and Lasnik's (1993) and Merchant's (2001, 2004) characterization of English VP-ellipsis is more or less on the right track, VP-ellipsis in English should be captured by PF-deletion rather than LF-copying (see Ross, 1967 and Sag, 1976 for the earlier PF-deletion analysis of VP-ellipsis). See also Watanabe (2005) and Lasnik (2007) for some discussion of theoretical necessity for the PF-deletion option in the recent framework of the MP. But see Winkler (2005) and references therein for a different view on VP-ellipsis.

10) See also Takahashi (2006, 2007, to appear) for discussion of the nature of null objects in Japanese.

11) It is to be noted, in fact, that, strictly speaking, Hoji (1998) does not show that overt V-raising cannot exist in Japanese, although he clearly shows that the null object construction in Japanese cannot be analyzed as involving an instance of GVPE (see also Hoji, 1998:130, fn.3). In fact, even if his analysis of the null object construction in Japanese is correct, which I also certainly concur with, postulating overt V-raising in Japanese is still compatible with his data.

12) See also Miyagawa (2001, 2003) and references therein among others for the claim that Japanese has V-v-T raising in overt syntax.

13) It is not clear whether Japanese possesses the class Aux in syntactic terms. It seems that the so-called "auxiliary verbs" in the literature of traditional Japanese grammar are in fact to be analyzed as independent verbs in syntactic terms along the lines of Kuroda (1981). Here, I am assuming that there would be no independent Aux between T and v in Japanese, without denying that modal auxiliary-like elements such as *daroo* 'would' can be merged TP-externally. As far as VP-ellipsis is concerned, whether Aux exists between T and v is crucial (see section 4.2).

14) It is to be noted that the restriction in (19) should be differentiated from the ones in Roberts (1998) and Potsdam (1997) in that the latter deal with the trace constraint on the head of an antecedent vP rather than an elided vP. See Lasnik (1997, 2003) for arguments against Roberts's (1998) and Potsdam's (1997) constraint on VP-ellipsis, as restated as in (i) by Lasnik (1997, 2003).

(i) $[_{VP}\ [_{V}\ e]\ X]$ cannot antecede VP-ellipsis of $[_{VP}\ [V]\ X]$, where V is lexical.

Note that, unlike Lasnik's (1999) constraint in (19), (i) is formulated as a constraint for VP-ellipsis in such as way that it refers to the empty status of the V head of the antecedent sentence, not that of the ellipsis sentence. My theory of VP-ellipsis is in line with Lasnik (1997, 2003) in this respect, although Lasnik (1997, 2003) suggests that a more limited version of (i) may be valid, saying that "a verb raised to check inflectional features (Tense and possibly agreement) leaves behind a trace that cannot antecede deletion of a (non-raised) verb lacking those inflectional features" (Lasnik, 2003: 116-117).

15) Recall from section 2.2 that (20b) can only be analyzed as involving a null object construction in Japanese.

16) Nunes (1999, 2004) defines the PF operation of *Chain Reduction* as follows.

(i) *Chain Reduction*:

Delete the minimal number of constituents of a non-trivial chain CH that suffices for CH to be mapped into a linear order in accordance with the LCA. (= Nunes, 2004:27,(44))

17) Although Chomsky (2000, 2001a,b, 2005a,b, 2007) seems to assume that the general principle of efficient computation as in (23) holds only with respect to the C_{HL} from Numeration/Lexical (Sub)array to LF, I am proposing that it should hold for the computation in the phonological component as well.

18) Following Chomsky's (1995) idea, Nunes (1995, 1999, 2004) assumes that there is an operation of the phonological component applying after Morphology that eliminates formal features that are visible at PF, as formulated in (i).

(i) *Formal Feature Elimination (FF-Elimination)*

Given the sequence of pair σ = <(F,P)1, (F,P)2, . . . , (F,P)N> such that σ is the output of Linearize, F is a set of formal features, and P is a set of phonological features, delete the minimal number of features of each set of formal features in order for σ to satisfy Full Interpretation at PF.

(= Nunes, 2004:31-32,(57))

19) I will assume that overt V-to-v movement must delete the lower link of its chain universally, probably because only the verbal complex [V-v] as a whole can be properly interpreted as a verb in the phonological component, possibly as an input to vocabulary insertion in the sense of the Distributed Morphology (Halle and Marantz, 1993; Marantz, 1997 *inter alia.*).

20) Liejiong (2003) clearly demonstrates that this construction does not have properties of VPEID but has properties of the null object construction. * here means that it cannot be an instance of VPEID. See also Soh (2007) for more discussion on VP-ellipsis in Chinese.

21) Since Doron (1999) does not contain any data demonstrating the existence of GVPE in Hebrew, I will simply assume that only VPEID is available in this language.

22) This proposal is different from Lasnik (1995), who claims that only the two types corresponding to (39a) and (39c) are allowed in UG. Under my theory, the type in (39b) is responsible for the unavailability of VP-ellipsis in Japanese-type languages.

23) I will leave open the important theoretical question as to what kinds of (formal) features at the probe and the goal are responsible for triggering the relevant head-movements. See Lasnik (1995) and Matushansky (2006) and references cited therein *inter alia.* for some discussion on this issue.

24) See Han et al. (2007) for the claim that there are two populations of Korean speakers, viz., one with V-raising and one without. I will leave an investigation into Korean with respect to the typological patterns in (38) in connection with Han et al.'s (2007) claim at hand.

25) See also Pollock (1989) and Chomsky (1991) for the earlier classical GB-treatment of verbal morphology.

26) See Emonds (1978) for the classical claim that main verbs do not move in English in contrast to French (see also Pollock 1989 and Chomsky 1991) and Liejiong (2003) for the claim that main verbs stay in vP in Chinese as well. My analysis of VP-ellipsis is compatible with those claims.

27) Incidentally, note also that Lasnik's (1997, 2003) analysis of Pseudogapping is compatible with my theory of VP-ellipsis, since an elided vP for Pseudogapping is not headed by a trace of a raised verb (although the antecedent vP is headed by a trace of a raised verb) under his analysis.

28) See Fox and Lasnik (2003) for the claim that sluicing and VP-ellipsis can be subsumed under a single PF deletion operation, with the difference stemming from the difference of the size with respect to the target constituents in the two ellipsis cases.

29) See also Fitzpatrick (2006) for arguments in favor of the view that head-movement is syntactic (not purely phonological) on the basis of a phenomenon of question truncation called *aux-drop*. I am grateful to Nobuhiro Miyoshi for bringing Fitzpatrick (2006) into my attention in this vein.

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