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LF Copy Analysis of Japanese Null Arguments*

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1 Introduction

It is known that some instances of Japanese null object sentences allow the sloppy identity reading. For example, having (1a) as the discourse antecedent, (1b) may mean either that John discarded Bill's letter (the strict identity reading) or that John discarded John's letter (the sloppy identity reading).

(1) a. Bill-wa zibun-no tegami-o suteta
Bill-TOP self-GEN letter-ACC discarded
'Bill$_i$ discarded his$_i$ letter'
b. John-mo [e] suteta
John-also [e] discarded
Lit. 'John also discarded [e]'

Otani and Whitman (1991) (henceforth, O&W) claim that the sloppy identity reading of Japanese null object sentences is obtained by VP-ellipsis. Extending Williams's (1977) LF Copy analysis of English VP-ellipsis to Japanese null objects, O&W argue that the phonologically missing object in (1b) is constructed by an LF Copy of the VP whose head verb has escaped out of it. The derivation of (1) is demonstrated in (2).

(2) *Verb Raising out of the VP*
a. Bill-wa [$_{VP}$[$_{NP}$ zibun-no tegami-o] t_V][$_V$ suteta];
John-mo [$_{VP}$ [e] t_V][$_V$ suteta]
Derived VP Rule
b. B-wa [$_{VP}$ λx[x[$_{NP}$ zibun-no tegami-o] t_V][$_V$ suteta];
J-mo [$_{VP}$ [e] t_V][$_V$ suteta]
Reflexive Rule
c. B-wa [$_{VP}$ λx[x[$_{NP}$ x-no tegami-o] t_V][$_V$ suteta];
J-mo [$_{VP}$ [e] t_V][$_V$ suteta]
VP Rule (Copy of VP)
d. B-wa [$_{VP}$ λx[x[$_{NP}$ x-no tegami-o] t_V][$_V$ suteta];
J-mo [$_{VP}$ λx[x[$_{NP}$ x-no tegami-o] t_V][$_V$ suteta]

The head verb *suteta* 'discarded' moves out of the VP (2a), a lambda operator is introduced (2b), the anaphor *zibun* is translated to a variable to ensure the binding relation between the subject and anaphor (2c), and the VP is copied to construct the contents of the second VP, which provides the structure for the sloppy identity reading (2d).

Hoji (1998), on the other hand, claims that the availability of a sloppy identity reading of Japanese null objects has nothing to do with VP-ellipsis, and that the relevant reading stems from some special properties of Japanese null

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objects. As for (1b), for instance, he claims that the indefinite use of null arguments gives the relevant reading; that is, the null argument is interpreted as an indefinite *tegami* 'letter' which can be understood as John's letter in the same way that the overt NP *tegami* 'letter' in *John-mo tegami-o suteta* 'John also discarded a letter/letters' can be understood as John's letter(s).[1]

In this paper, I will first introduce some data which independently support Hoji's claim that VP-ellipsis is irrelevant to the sloppy reading of Japanese null arguments. Next, I will compare null subjects in Japanese and in Spanish, concluding that the relevant property is not a property of phonologically empty arguments in general. Finally, pointing out one difficulty in Hoji's analysis, I will propose that the relevant reading of Japanese null arguments is obtained by LF Copy of the argument, and argue that the property that makes LF Copy of arguments possible follows from an independent property of Japanese predicates.

2 Against the VP-ellipsis analysis[2]

In this section, I will introduce four types of new data. The first shows that the sloppy identity reading is available for null subjects as well, already suggesting that the relevant reading is not necessarily contingent on VP-ellipsis. The second data show that the sloppy identity reading is available even when the VP-ellipsis cannot derive the relevant structure, again suggesting that VP-ellipsis is not the sole source of the sloppy reading in Japanese. The third data show that locality effect of the sloppy identity reading is not always observed, implying that O&W's specific analysis (partly motivated by this locality effect) may not be maintained. The fourth data show, independently of the sloppy identity reading, that VP-ellipsis cannot derive the structure in which the head verb remains unelided in Japanese, implying that VP-ellipsis can never be the source of the sloppy identity reading in Japanese.

2.1 The sloppy identity reading for null subjects

Having (3a) as the preceding discourse, (3b) can mean either that John also thinks that John's proposal will be accepted (the sloppy reading), or that John also thinks that Mary's proposal will be accepted (the strict reading). Likewise, (4b) can mean either that John also thinks John's student passed the exam (the sloppy reading), or that John also thinks that Bill's student passed the exam (the strict reading).[3]

(3) a. Mary-wa [zibun-no teian-ga saiyo-sare-ru-to] omotteiru
Mary-TOP [self-GEN proposal-NOM accept-PASS-PRES-COMP] think
'Mary$_i$ thinks that her$_i$ proposal will be accepted'

b. John-mo [[e] saiyo-sare-ru-to] omotteiru
John-also [[e] accept-PASS-PRES-COMP] think
'Lit. John also thinks that [e] will be accepted'

(4) a. Bill-wa [zibun-no gakusei-ga siken-ni tootta-to] omotteiru
Bill-TOP [self-GEN student-NOM exam-DAT passed-COMP] think
'Bill$_i$ thinks that his$_i$ student passed the exam'

b. John-mo [[e] siken-ni tootta-to] omotteiru
John-also [[e] exam-DAT passed-COMP] think

'John also thinks that [e] passed the exam'

This is already very suggestive that the sloppy identity reading is not necessarily contingent on VP-ellipsis.[4] I will compare Japanese null subjects with Spanish null subjects in Section 3.

2.2 The sloppy identity reading in an anti-VP-ellipsis construction

Nemoto (1993) observes that in the double object construction in Japanese, the accusative anaphor cannot precede the dative antecedent at surface structure:

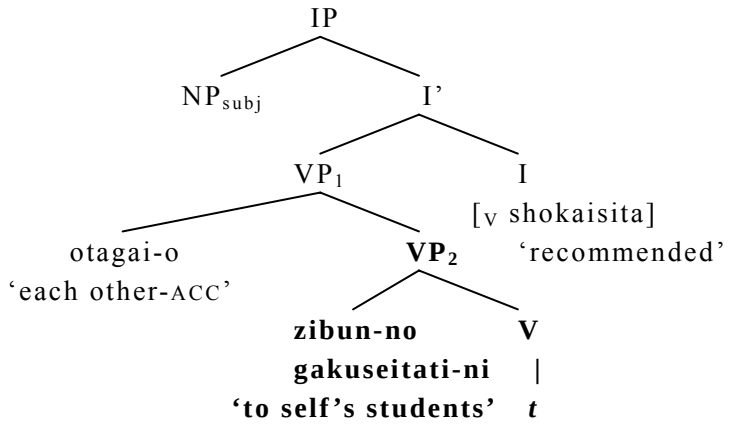
(5) a. John-wa [$_{NP}$ zibun-no gakuseitati-ni][$_{NP}$ otagai-o] shokaisita
John-NOM [$_{NP}$ self-GEN students-DAT][$_{NP}$ each other-ACC] introduced
'John introduced (to) his students each other'
b.*John-wa [$_{NP}$ otagai-o] [$_{NP}$ zibun-no gakuseitati-ni] shokaisita
John-TOP [$_{NP}$ each other-ACC][$_{NP}$ self-GEN students-DAT] introduced
'John introduced each other to his students'

(5a) is good where the dative antecedent precedes the accusative anaphor, while (5b) is very bad where the accusative anaphor precedes the dative antecedent. Let us assume, following Miyagawa (1997), that the accusative NP and the dative NP can be base-generated freely in either order, and let us further assume that the first NP asymmetrically c-commands the second. In (5b), then, the anaphor *otagai* 'each other' is not bound, while the R-expression *zibun-no gakuseitati* 'self's students' is, and hence (5b) violates both Binding Conditions A and C (Chomsky 1981). Bearing this fact in mind, let us consider (6).

(6) a. Bill-wa kyositu-de [$_{NP}$ zibun-no gakuseitati-ni][$_{NP}$ otagai-o]
Bill-TOP classroom-in [$_{NP}$ self-GEN students-DAT] [$_{NP}$ each other-ACC]
shokaisita
introduced
Lit. 'Bill introduced (to) his students each other in the classroom'
b.?John-wa ofisu-de [e] [$_{NP}$ otagai-o] shokaisita
John-TOP office-in [e] [$_{NP}$ each other-ACC] introduced
Lit. 'John introduced [e] each other in the office'

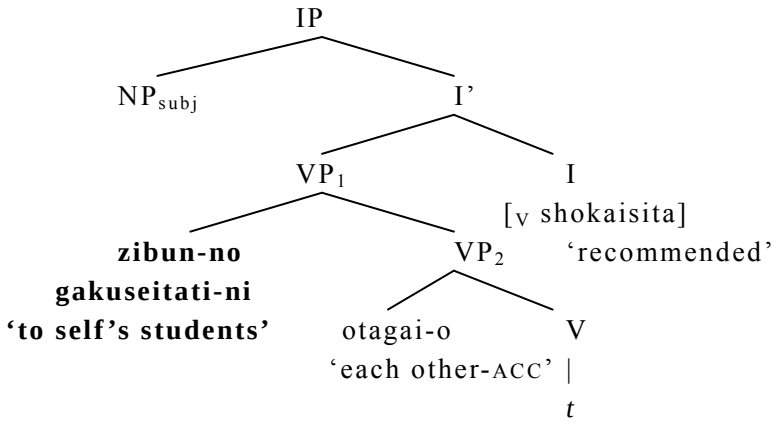
Having (6a) as the antecedent sentence, (6b) is fairly good with the sloppy reading. It may be slightly degraded, probably because only one of the two object arguments is missing and the other is redundantly repeated. However, (6b) is far better than (5b), which is severely degraded. If (6b) is derived by VP-ellipsis, there must be a VP-constituent that contains *zibun-no gakuseitati* 'self's students' to be elided and at the same time excludes the head verb AND *otagai* 'each other,' making them the remnants. The relevant structure must therefore be something like (7). Notice, however, that (7) violates the two binding conditions, as shown in (5b); hence if the structure for (6b) were (7), (6b) should be as bad as (5b), contrary to fact.

(7)



The only remaining possible structure for (6b) is something like (8), in which only the dative argument is phonologically missing.

(8)



No VP-ellipsis is involved in this derivation, but the sloppy reading of the phonologically missing argument is still possible. This shows that VP-ellipsis cannot be the only source for the sloppy reading of null arguments in Japanese.

2.3 No locality of the sloppy identity reading

One piece of O&W's evidence for their analysis is that Williams (1977) type VP-ellipsis analysis can account for the locality effect of the sloppy identity reading of Japanese null objects. O&W claim that (9b) does not allow the sloppy identity reading, and only the strict identity reading is possible, meaning that John also heard that the *NY Times* is quoting Bill's article.

(9) a. Bill$_i$-wa [[*NY Times*-ga zibun$_i$-no kizi-o inyoositeiru-to] kiita
Bill-TOP [[*NY Times*-NOM self-GEN article-ACC quoting-COMP] heard
'Bill$_i$ heard that the *NY Times* is quoting his$_i$ article'

b. John-mo [[*NY Times*-ga [e] inyoositeiru-to] kiita
John-also [[*NY Times*-NOM [e] quoting-COMP] heard
Lit. 'John also heard that the *NY Times* is quoting [e]'

The relevant derivation of the LF representation of (9) goes as follows:

(10) *Verb-Raising*

a. B-wa [$_{VP1}$[$_{CP}$[$_{IP}$*NYT*-ga [$_{VP2}$[zibun-no kizi-o] t_V][$_V$ inyoositeiru]] to] t_V] [$_V$ kiita]
J-mo [$_{VP1}$[$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$ [e] t_V][$_V$ inyoositeiru]] to] t_V][$_V$ kiita]

Derived VP Rule

b. B-wa[$_{VP1}$λ*x*[*x*[$_{CP}$[$_{IP}$*NYT*-ga[$_{VP2}$[zibun-no kizi-o]t_V][$_V$inyoositeiru]]to] t_V] [$_V$ kiita]
J-mo [$_{VP1}$ λ*y*[*y*[$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$ [e] t_V][$_V$ inyoositeiru]] to] t_V][$_V$ kiita]

Reflexive Rule

c. B-wa[$_{VP1}$λ*x*[*x*[$_{CP}$[$_{IP}$*NYT*-ga[$_{VP2}$[*x*-no kizi-o]t_V][$_V$inyoositeiru]]to] t_V] [$_V$ kiita]
J-mo [$_{VP1}$ λ*y*[*y*[$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$ [e] t_V][$_V$ inyoositeiru]] to] t_V][$_V$ kiita]

VP Rule (LF Copy of VP)

d. B-wa[$_{VP1}$λ*x*[*x*[$_{CP}$[$_{IP}$*NYT*-ga[$_{VP2}$[*x*-no kizi-o]t_V][$_V$inyoositeiru]]to] t_V] [$_V$ kiita]
J-mo [$_{VP1}$λ*y*[*y*[$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$[*x*-no kizi-o]t_V][$_V$ inyoositeiru]] to] t_V] [$_V$ kiita]

Assuming crucially that each application of the Derived VP Rule introduces a different λ-operator, the result of this derivation contains a free variable in the copied material [*x-no kizi*] 'x's article' in the second clause of (10d), which makes this representation ungrammatical; hence, no sloppy identity reading is possible.

Hoji (1998) claims that (9b) does not show such locality effects, contrary to the claim made by O&W. Although some speakers still find it hard to get the sloppy identity reading in (9b), I will present here clearer examples in which the sloppy reading is readily available:[5]

(11) a. Dareka$_i$-ga [NY Times-ga zibun$_i$-no kizi-o inyoosita-to] itteiru no?
someone-NOM [NYT-NOM self-GEN article-ACC quoted-COMP] saying Q
'Is anyone$_i$ saying that the *NYT* quoted his$_i$ article?'

b. John-ga [NY Times-ga [e] inyoosita-to] itteimasu
John-NOM [NYT-NOM [e] quoted-COMP] saying
Lit. 'John is saying that the *NYT* quoted [e]'

(12) a. (John igaino) daremo-ga [komittee-ga zibun-no ronbun-o
(J except) everyone-NOM [committee-NOM self-GEN paper-ACC
toosu-to] omotteinai ga,
accept-COMP] think-not but
'Everyone$_i$ (except John) does not think that the committee will accept his$_i$ paper but...'

b. John-wa [komittee-ga [e] toosu-to] omotteiru
John-TOP [committee-NOM [e] accept-COMP] think
Lit. 'John thinks that the committee will accept [e]'

Both (11) and (12) allow the sloppy identity reading fairly easily.[6] The ultimate LF representation of (11b) in O&W's analysis would be something like (13), in which the variable *x* in the second clause is not bound; hence, the sloppy identity reading

should be unavailable in (11) in the same way as it was in (9)/(10).

(13) Dareka-ga [$_{VP1}$ λ*x*[*x* [$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$[*x*-no kizi-o] t_V][$_V$ inyoosita]]to] t_V] [$_V$ itteiru] no
John-ga [$_{VP1}$ λ*y*[*y* [$_{CP}$[$_{IP}$NYT-ga [$_{VP2}$[*x*-no kizi-o] t_V] [$_V$ inyoosita]] to] t_V] [$_V$ itteimasu]

Therefore, O&W's specific analysis based on Williams (1977) cannot be maintained as it stands.[7]

2.4 No VP-ellipsis in Japanese

There is one more piece of data that strongly suggests, independently of the availability of the sloppy identity reading, that VP-ellipsis cannot be the source of the sloppy identity reading in Japanese null argument structures. Recall that in O&W's analysis, it is crucial that the head verb has escaped out of the relevant VP before LF Copy of the VP applies. In other words, LF Copy of the VP whose head is the trace of the head verb is possible. However, there is evidence that such a derivation is not available in Japanese:

(14) a. Bill-wa kuruma-o teineini aratta
Bill-TOP car-ACC carefully washed
'Bill washed the car carefully'
b. John-wa [e] arawa-nakat-ta
John-TOP [e] wash-not-PAST
Lit. 'John didn't wash [e]'

(15) a. Bill-wa gohan-o sizukani tabeta
Bill-TOP meal-ACC quietly ate
'Bill ate the meal quietly'
b. John-wa [e] tabe-nakat-ta
John-TOP [e] eat-not-PAST
Lit. 'John didn't eat [e]'

In (14b) and (15b), it is hard to get the interpretation in which the adverb is understood in the elliptic site; that is, in (14b), it is hard to get the reading that John didn't wash the car carefully, which implies that John did wash the car but not in a careful manner. Instead, the most natural and easily available interpretation of (14b) is that John didn't wash the car at all. Likewise, (15b) means that John didn't eat the meal at all. The most natural way to express the idea that John didn't wash the car carefully in the context of (14) is to say *John-wa [e] teineini arawanakatta* 'John didn't wash [e] carefully' where the adverb remains overtly. With English VP-ellipsis, in contrast, the relevant reading is easily available:

(16) a. Bill washed the car carefully, but
b. John didn't.

The most prominent reading of (16b) is that John didn't wash the car carefully,

implying that John did wash the car but not in a careful manner. This is straightforwardly accounted for by assuming that the adverb *carefully* is part of the VP which is elided, and hence the relevant LF representation of (16b) is (17).

(17) John didn't [$_{VP}$ [$_{VP}$ wash the car] carefully]

Coming back to the Japanese example, suppose, following the general assumptions, that adverbs like *teineini* 'carefully' or *sizukani* 'quietly' are attached to a VP in the structure, and that there is no phonologically empty proform for adverbs like *carefully* and *quietly*. Given these two natural assumptions, the facts in (14) and (15) naturally follow if VP-ellipsis is not available in Japanese. However, if VP-ellipsis as in (18) *is* available in Japanese, the facts in (14) and (15) are mysterious. The relevant reading would have to be easily available if a derivation like (18) were possible, because the adverb and the object are contained in the elided VP.

(18) *Verb Raising + VP-Ellipsis*

John-wa	**[$_{VP}$ [$_{VP}$ kuruma-o t_V] teineini]**	[$_V$ arawa-nakat-ta]
John-TOP	**[$_{VP}$ [$_{VP}$ car-ACC t_V] carefully]**	[$_V$ wash-not-PAST]

This argument strongly suggests that there is no VP-ellipsis in which the head verb is a remnant; VP-ellipsis cannot derive sentence (1b), for instance. Hence, I conclude that the source of the sloppy reading in Japanese null object structures cannot be VP-ellipsis, contra O&W.

Given that VP-ellipsis cannot be the source of the sloppy identity reading of Japanese null arguments, we must explore how such a reading is obtained without VP-ellipsis. This is the topic of the final section (Section 4) of this paper. Before addressing this topic, however, I will briefly point out that null subjects in Japanese differ from null subjects in Spanish.

3 Null subjects: Japanese vs. Spanish

Let us consider (3), repeated here as (19), and its Spanish counterpart (20).[8]

(19) a. Mary-wa [zibun-no ronbun-ga saiyo-sare-ru-to] omottaeiru
Mary-TOP [self-GEN paper-NOM accept-PASS-PRES-COMP] think
'Mary$_i$ thinks that her$_i$ paper will be accepted'

b. John-mo [[e] saiyo-sare-ru-to] omotteiru
John-also [[e] accept-PASS-PRES-COMP] think
Lit. 'John also thinks that [e] will be accepted'

(20) a. Maria cree [que su propuesta sera aceptada] y
Maria believes [that her proposal will-be accepted] and
'Maria$_i$ believes that her$_i$ proposal will be accepted and …'

b. Juan tambien cree [que *pro* sera aceptada]
Juan too believes [that *pro* will-be accepted]
Lit. 'Juan also believes that *pro* will be accepted'

We have seen in Section 2.1 that (19b) allows the sloppy identity reading. In the Spanish counterpart (20b), on the other hand, only the strict identity reading is possible: (20b) means that Juan believes that Maria's proposal will be accepted and it never means that Juan believes that Juan's proposal will be accepted. The properties of the null subject in (20) are quite different from the properties of the null subject in (19). In other words, the sloppy identity reading is not a property of phonologically empty arguments in general. Spanish null subjects behave like English overt pronouns, because the English counterpart of (20), using the pronoun *it* in place of *pro*, also allows only the strict identity reading. Let us consider one more pair of examples, to show that this Japanese-Spanish contrast is more general:

(21) a. seerusuman-ga Mary-no uchi-ni kita
salesman-NOM Mary-GEN house-to came
'A salesman came to Mary's house'
b. [e] John-no uchi-ni-mo kita
[e] John-GEN house-to-also came
Lit. '[e] came to John's house, too'

(22) a. Un vendedor fue a la casa de Maria y
a salesman went to the house of Maria and
'A salesman went to Maria's house and'
b. tambien *pro* fue a la casa de Juan
also *pro* went to the house of Juan
'Also *pro* went to Juan's house'

In Japanese example (21), the salesman who visited John's house can be a different salesman from the one who visited Mary's house. Let us call this "the indefinite reading" of null arguments, because (21b) can be understood as if the indefinite *seerusuman* 'a salesman' is in the subject. In Spanish example (22), on the other hand, the salesman who visited Juan's house must be the same person who visited Maria's house. Again, Spanish null subjects behave like the English overt pronoun (*he*, in this case), while Japanese null subjects behave quite differently. The Japanese null subjects in (19) and (21) behave as if the whole subject of the first embedded clause is repeated in the second embedded clause. That is, the null argument in (19b) is understood as if the noun phrase *zibun-no teian* 'self's proposal' is there, and the null argument in (21b) is understood as if the noun phrase *seerusuman* 'a salesman' is there. In the final section, I propose an analysis which accounts for this contrast between Japanese and Spanish in a principled way, and at the same time is free from the problems in VP-ellipsis analysis.

4 Deriving null argument properties: LF copy analysis

We have seen in Section 1 that Hoji (1998) claims that the sloppy identity reading observed in (1) stems from the indefinite use of null arguments. However, there are other instances of the sloppy identity reading for which Hoji (1998) claims that the relevant reading is derived from the referential use of null arguments. In the rest of this paper, I will first argue that Hoji's second proposal faces an empirical

problem. I will then propose that the relevant facts are accounted for by an LF Copy of the argument. I will finally argue, as an independent motivation for LF Copy analysis, that the fundamental property which makes possible the sloppy identity reading and the indefinite reading of Japanese null arguments follows from the same property of Japanese predicates that makes scrambling possible. In other words, I will claim that the properties of null arguments and the availability of scrambling (although seemingly unrelated) are systematically related.

Hoji argues that the sloppy identity reading is possible in (23) because of the referential use of null arguments.

(23) a. Bill-wa zibun(zisin)-o suisensita
Bill-TOP self(-self)-ACC recommended
'Bill recommended himself'
b. John-mo [e] suisensita
John-also [e] recommended
Lit. 'John also recommended [e]'

That is, the null argument in (23b) can refer to the person John who the subject NP *John* also refers to. Hence, the coreference between the recommender and recommendee is established. Note that the null argument cannot be a reflexive anaphor because (23b) in isolation cannot mean that John recommended himself. Hoji argues then that although the null argument in (23b) is not a reflexive anaphor, it does not violate Binding Condition B (Chomsky 1981), because a bound variable is not at stake here. Hoji assumes that binding conditions are relevant only to bound variables, but not to coreference, following the spirit of Reinhart (1983). Hoji's analysis predicts then that if the subject is a nonreferential quantificational expression, the sloppy reading is no longer available.

Takahashi (1996), however, notes that the relevant sloppy reading is possible even when the subject is a nonreferential quantificational expression:

(24) (John igaino) subete-no gakusei-ga [e] suisensita kara
(John except) all-GEN student-NOM [e] recommended because
John-mo zibun-o suisensita
John-also self-ACC recommended
Lit. 'Because every student (except John) recommended [e], John also recommended himself'

Notice here that the subject of the first clause in (24) is a universally quantified NP and does not refer to any individual. Therefore, unlike (23), the coreference between the subject and the null argument cannot be established by the referential use of the null argument, under Hoji's analysis. However, I side with Takahashi and find no difference between (24) and (23) with respect to the availability of the sloppy reading; the sloppy identity reading is available in (24). If this is correct, Hoji's argument based on the referential use of null arguments faces a problem.

However, although Takahashi (1996) argues for VP-ellipsis analysis of the

sloppy reading in Japanese, we have already seen that VP-ellipsis which makes the head verb unelided is not possible, and hence we cannot appeal to this analysis as the source of the sloppy reading in (23) and (24). To overcome this difficulty, I propose that the LF Copy operation can construct the contents of the phonologically missing argument. I am crucially claiming that only the relevant argument (not the VP) is involved (as in Hoji 1998) and at the same time that the relevant mechanism for constructing the missing element is LF Copy (as in O&W).

(25) *Proposal*
LF Copy of the argument can construct the contents of a phonologically missing argument

Therefore, LF Copy constructs the contents of the missing argument as identical to the original antecedent NP, which provides the right structure for the sloppy identity reading. This mechanism also covers other cases of the sloppy identity reading which, Hoji claims, follows from indefinite use of Japanese null arguments. For instance, (26), which is the LF representation of (1), shows that LF Copy of NP_1 constructs the contents of NP_2, which provides the structure for the sloppy identity reading. Likewise, the structure for the relevant reading of (19) is provided by LF Copy as shown in (27): LF Copy of NP_1 constructs the contents of NP_2.

(26) a. Bill-wa [$_{NP1}$ zibun-no tegami-o] suteta
Bill-TOP[$_{NP1}$ self-GEN letter-ACC] discarded
LF Copy of NP_1 onto NP_2
b. John-mo **[$_{NP2}$ zibun-no tegami-o]** suteta
John-also **[$_{NP2}$ self-GEN letter-ACC]** discarded

(27) a. Mary-wa [[$_{NP1}$ zibun-no ronbun-ga] saiyo-sare-ru-to] omottaeiru
Mary-TOP [[$_{NP1}$ self-GEN paper-NOM] accept-PASS-PRES-COMP] think
'Mary$_i$ thinks that her$_i$ paper will be accepted'
LF Copy of NP_1 onto NP_2
b. John-mo [**[$_{NP2}$ zibun-no ronbun-ga]** saiyo-sare-ru-to] omotteiru
John-also [**[$_{NP2}$ self-GEN paper-NOM]** accept-PASS-PRES-COMP] think
'John also thinks that John's paper will be accepted'

Further, the structure for the indefinite reading of the null argument in (21) is also provided by LF Copy as shown in (28).[9]

(28) a. [$_{NP1}$ seerusuman-ga] Mary-no uchi-ni kita
[$_{NP1}$ salesman-NOM] Mary-GEN house-to came
'A salesman came to Mary's house'

LF Copy of NP_1 onto NP_2
b. **[$_{NP2}$ seerusuman-ga]** John-no uchi-ni-mo kita
[$_{NP2}$ salesman-NOM] John-GEN house-to-also came
'A salesman came to John's house, too'

I will now argue that (25), which is responsible for the sloppy identity reading and the indefinite reading of Japanese null arguments is possible because of an independent property of Japanese predicates.[10]

Bošković and Takahashi (1996) propose a novel theory of scrambling: so-called scrambled phrases are base-generated at their surface position and lower to a θ-position in covert syntax to check a θ-feature of the predicate, assuming that θ-roles are features to be checked. Therefore, the movement involved is LF Lowering that is feature-driven and obligatory. This is consistent with the last resort view of movement. The derivation is demonstrated in (29), where *sono hon* 'that book' is base-generated at its surface position and lowers to a θ-position in covert syntax to check the undischarged object θ-feature of the verb *watasita* 'handed.'

(29) a. *Overt Syntax*
sono hon-o Bill-ga [Mary-ga John-ni watasita to] omotteiru
that book-ACC Bill-NOM [Mary-NOM John-DAT handed COMP] think
Lit. 'That book, Bill thinks that Mary handed to John'
b. *Covert Syntax*
Bill-ga [Mary-ga John-ni **sono hon-o** watasita to] omotteiru
Bill-NOM [Mary-NOM John-DAT **that book-ACC** handed COMP] think
|_____ LF Lowering _____|

I will present one of Bošković and Takahashi's arguments to highlight the contrast between Japanese and English. Let us consider (30a), where the embedded object *dare-no shasin-o* 'who-GEN picture-ACC' appears in front of the non-interrogative matrix clause, but it still takes embedded scope (Saito 1989).

(30) a. *Overt Syntax*
[dare-no shasin-o] John-ga [Mary-ga katta ka] sitteiru
[who-GEN picture-ACC] John-NOM [Mary-NOM bought Q] know
'John knows who Mary bought some pictures of'
b. *Covert Syntax*
John-ga [Mary-ga **[dare-no shasin-o]** katta ka] sitteiru
John-NOM [Mary-NOM **[who-GEN picture-ACC]** bought Q] know
|_____ LF Lowering _____|

Given that *wh*-phrases must be in the scope of an interrogative Comp, LF undoing is necessary to get the structure for the right interpretation (30b). This effect of LF undoing is straightforward in Bošković and Takahashi's analysis. *Dare-no shasin-o* 'who-GEN picture-ACC' is base-generated at the surface position as in (30a) and lowers to check the θ-feature of the embedded verb *katta* 'bought' as in (30b).[11] This sharply contrasts with English cases like (31a), where the embedded object *some pictures of who* appears in front of a non-interrogative matrix clause, which makes the sentence ungrammatical.

(31) a.*[Some pictures of who]$_i$, John knows [who bought **t**$_i$]

b. John knows who bought some pictures of who.

(31a) is very bad, unlike a simple subjacency violation as in *?[Some pictures of Mary]$_i$, John knows who bought t_i*. If LF undoing like Japanese (30) is possible in English, sentence (31a) would have an LF representation like (31b) and thus it would be as good as *John knows who bought some pictures of who*. This shows that LF undoing (for the purpose of *wh*-scope) is not possible in English.

To account for this difference between Japanese and English, Bošković and Takahashi propose (32).

(32) a. θ-features are "weak" in Japanese
b. θ-features are "strong" in English
("weak/strong" in the sense of Chomsky 1992, 1994)

Weak features must be checked by the LF interface (not necessarily in overt syntax). Hence, there is nothing wrong with derivations in which an argument phrase is base-generated at a non-θ-position, insofar as the phrase checks the θ-feature of the predicate by the LF interface by means of LF movement.[12] English θ-features, on the other hand, are strong; strong features must be checked in overt syntax; otherwise, the derivation crashes. Hence, for (31), a derivation as in Japanese scrambling would leave the strong θ-feature of the verb *bought* unchecked in overt syntax, and the derivation crashes. The only way to get the surface order of (31a) is to base-generate the phrase *some pictures of who* in the embedded object position to check the strong θ-feature and then topicalize it to the surface position. Now, there is no motivation for LF Lowering after the topicalization, the last resort principle prevents LF Lowering. *Who* in the topicalized phrase stays outside of the scope of the interrogative Comp, and thus the sentence is out.[13]

Bošković and Takahashi's LF theory of scrambling can neatly explain the difference between Japanese and English with respect to the availability of scrambling. I will finally show that (32) also accounts for some other differences between Japanese and English/Spanish in an interesting way. First, as for Japanese null arguments, I claim that the sloppy identity reading (as in (26)/(27)) and the indefinite reading (as in (28)) of phonologically empty arguments in Japanese follow from exactly the same mechanism that makes scrambling possible in Japanese. That is, since θ-features are weak in Japanese, in overt syntax there need not be anything in the argument position marked by [e] in all the relevant Japanese examples mentioned above. LF Copy of the antecedent NP provides another NP in this position to check the undischarged θ-feature, giving the right structure for the sloppy identity reading or the indefinite reading.

Second, it is generally assumed that Spanish does not allow scrambling. Under Bošković and Takahashi's (1996) LF analysis of scrambling, this means that θ-features are strong in Spanish. Given this, the properties of Spanish null subjects we have seen naturally follow: the subject θ-feature must be discharged in overt syntax, and I assume that it is checked by the pronoun *pro*. Pronouns usually do not allow the sloppy identity reading or the indefinite reading, which is

confirmed by the behaviors of English overt pronouns we have seen in Section 3. Further, since there is already a pronoun in the subject position and the relevant θ-feature has been satisfied in overt syntax, LF Copy cannot apply to construct the contents of the phonologically empty subject. Therefore, only the strict identity reading is allowed with Spanish null subjects.

Finally, (32) also gives a natural account for the following facts in English: null arguments are not possible in English, and even with verbs that optionally allow missing objects, the interpretation of the sentence is quite different from that of the Japanese counterpart. Let us look at the following examples:

(33) a.*Bill$_i$ discarded his$_i$ letter, and John discarded, too.
b. Bill$_i$ ate his$_i$ shoe, and John ate, too.

(33a) is ungrammatical and (33b) does not have the readings which are available in the corresponding Japanese examples. In (33a), LF Copy of *his letter* may construct an LF representation like (34).

(34) Bill discarded [$_{NP1}$ his letter], and John discarded **[$_{NP2}$ his letter]**, too.
|_____ LF Copy _____|

However, the object θ-feature of the verb *discard* is strong and thus must be checked in overt syntax. LF Copy, which provides NP_2 as the argument of the verb, is too late to discharge the θ-feature. Similarly, even with a verb like *eat* in (33b) which optionally allows missing objects, the second clause of (33b) simply means that John did some eating activity. Neither the strict reading (i.e., John ate Bill's shoe) nor the relevant sloppy reading (i.e., John ate his own shoe) can be obtained, although both of them are available readings in the corresponding Japanese sentences.[14] Suppose first that *eat* enters the computation with the object θ-feature to be discharged. LF Copy might derive (35a), allowing the sloppy reading. (35b) might be derived by LF Copy plus vehicle change (Fiengo and May 1994) which changes the R-expression *his shoe* into the corresponding pronoun *it* under LF Copy, allowing the strict reading, even if we follow the general assumption that there is no null pronoun *pro* available in English.

(35) a. Bill ate [$_{NP1}$ his shoe], and John ate **[$_{NP2}$ his shoe]**, too.
|_____ LF Copy _____|
b. Bill ate [$_{NP1}$ his shoe], and John ate **[$_{NP2}$ it]**, too.
|___ LF Copy & _____|
vehicle change

However, sentence (33b) in these derivations is already ruled out because the strong θ-feature is not discharged in overt syntax. Suppose, on the other hand, that *eat* enters the computation without the object θ-feature to assign. Then sentence (33b) is correctly ruled in; there is nothing wrong with the argument structure of the sentence. This time, however, LF Copy cannot apply to derive (35), because

there is no object θ-feature and thus no position can be created for the argument to be copied onto. Therefore, there is no way to derive (35); hence, the lack of the readings represented in (35) is accounted for.

The most interesting claim the present analysis makes is that facts like (33) in English and (20)/(22) in Spanish follow from exactly the same mechanism that makes scrambling impossible in these languages, while the availability of the sloppy identity reading and the indefinite reading with Japanese null arguments follow from exactly the same mechanism that makes scrambling possible in Japanese.

5 Conclusion

I have provided new data which argue that VP-ellipsis is not involved in the sloppy identity reading of null arguments in Japanese, independently supporting Hoji's (1998) idea that only the relevant NP (not the VP) is involved. Having shown that the relevant property of null arguments in Japanese is not a property of phonologically empty arguments in general, I have proposed that LF Copy provides the structure for the sloppy identity or indefinite reading. Finally, I have argued that Bošković and Takahashi's (1996) LF analysis of Japanese scrambling can be extended to explain why LF Copy analysis of null arguments is possible in Japanese, while it is not in English and Spanish. In other words, I am claiming that the availability of scrambling and the availability of null arguments are systematically related. Although an extensive cross-linguistic investigation is required to evaluate the present hypothesis, this theory can be seen as an explicit attempt to capture an old observation of Hale (1983): typologically, free word order languages (or scrambling languages) tend to allow extensive use of null anaphora. The present analysis is very similar in spirit to Hale's configurational parameter approach, but is more in conformity with the general picture of the recent minimalist approach.

Notes

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[1] Hoji (1998) calls the relevant reading in Japanese "sloppy-like reading," because he claims that the reading is not the real sloppy identity reading as in English VP-ellipsis. I will use the term "sloppy identity reading" in this paper, even when Hoji's analysis is being discussed, partly because of expository convenience and partly because I ultimately claim that the relevant reading is an instance of real sloppy identity reading.

[2] The arguments I am going to present here are quite different from what Hoji (1998) presents, although I share with Hoji the idea that what is involved is the argument itself and not the VP.

[3] Nobu Miyoshi (personal communication) first pointed out to me the possibility of the sloppy identity reading for null subjects in Japanese.

[4] The data presented in (3) and (4) are not conclusive, however. One may claim that there is a way to save the VP-ellipsis analysis for (3) and (4). If we follow Kuroda (1988), and Fukui and Speas (1986), among others, Japanese subjects can remain VP internal. Then, once the

head verb has raised out of the VP as O&W argue and the object NP *siken-ni* 'exam-DAT' in (4b) has been scrambled out of the VP, there is a VP constituent that contains the subject and excludes everything else and hence VP-ellipsis can derive the sentences in (3b) and (4b). However, I will show in Section 2.4 that such a derivation is not possible on independent grounds.

[5] Hoji (1998) cites Kim (1995) who independently points out the lack of locality effects with regard to analogous data in Korean. Unfortunately, I have not had a chance to see Kim's argument to check whether it is similar to what I am going to present here.

[6] There seems to be no corresponding strict reading in (11) for some reason, but such a fact alone should not make the sloppy reading available under O&W's analysis.

[7] Although the text argument shows that O&W's analysis based on the locality effects of the sloppy identity reading cannot be maintained, the contrast between (9) and (11)/(12) (at least for some speakers) still remains to be accounted for, which is a nontrivial issue. See Fiengo and May (1994) for a suggestion for a similar fact in English.

[8] I thank Adolfo Ausin and Marcela Depiante for helping me with Spanish data.

[9] As for the strict identity reading also available in (26) and (27) and the same-salesman reading also available in (28), I suggest that there are two possible ways to obtain them. One is simply to assume that null pronoun *pro* appears in the phonologically empty position [e] which exclusively refers to the same thing/individual as the corresponding NP in the antecedent clause, in the same way as the overt pronoun *sore* 'it' does in (27), for instance. This ensures the strict reading. The other possible way is to assume Fiengo and May's (1994) "vehicle change", by which an R-expression can change into the corresponding pronoun under LF Copy. Again, the constructed argument is a pronoun corresponding to the antecedent R-expression, ensuring the strict reading.

[10] Hoji (1998) claims that a sloppy reading is not possible with certain verbs as in (i), and this is one of his arguments against the VP-ellipsis analysis.

(i)	Bill-wa zibun-o nagusameta;	John-mo *ec* nagusameta
	Bill-TOP self-ACC consoled	John-also *ec* consoled
	'Bill consoled himself'	Lit. 'John consoled ec'

If Hoji is correct, (i) is problematic for the LF Copy analysis I am exploring. However, I believe that the sloppy reading is still possible in (i), although I must admit that it is slightly harder to get here than with other verbs like *suisensuru* 'recommend'. I have no explanation for this difference at the moment (see Hoji 1998: fn. 14 for a discussion).

[11] The text argument shows that scrambling can be undone in LF. Bošković and Takahashi's theory actually makes a stronger claim that scrambling must be undone in LF, because θ-features, weak though they are in Japanese, must be checked eventually before the derivation arrives at the LF interface. See Sohn (1994), for instance, who shows that scrambling must be undone in LF.

[12] For other arguments for movement to a θ-position, see Bošković (1994).

[13] It is a big mystery, however, why reconstruction of A'-movement is possible for binding purposes, while it is impossible for the purposes of *wh*-scope.

[14] See footnote 9 for possible ways to obtain the strict reading in the corresponding Japanese example.

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