

Ellipsis of Disjunction for LF-copy Analysis

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1 Introduction

In Japanese, arguments can be dropped freely, unlike in English. This difference is illustrated in (1) and (2).

(1) * Bob washed his car, but Hiroshi didn't wash Δ .

- (2) a. Bob-wa zibun-no kuruma-o arat-ta.
Bob-TOP self-GEN car-ACC wash-PST
Lit: 'Bob washed self's car.'
- b. Hiroshi-wa Δ arawa-nakat-ta.
Hiroshi- TOP wash-NEG- PST
Lit: 'Hiroshi didn't wash Δ .'
- c. Hiroshi-wa sore-o arawa-nakat-ta.
Hiroshi- TOP it- ACC wash- NEG - PST
'Hiroshi didn't wash it.'

If an argument in object position is dropped, as shown in (1), the sentence is ungrammatical in English. On the other hand, in Japanese, (2b) is grammatical even if the object (*zibun-no kuruma-o* 'self's car') is dropped. Japanese null arguments were traditionally analyzed as empty pronouns *pro* (see Kuroda 1965, among many others). However, Otani and Whitman (1991) pointed out that null arguments do not always correspond to *pro*. For instance, if the null argument in (2b) refers to the object of the antecedent (*zibun-no kuruma-o* 'self's car'), two interpretations are available: *Hiroshi did not wash Bob's car* and *Hiroshi did not wash his own car*. In this paper, the former interpretation is called the strict reading and the latter is called the sloppy reading. When the null argument is replaced by the overt pronoun *sore* 'it,' as shown in (2c), the sentence has only the strict reading: *Hiroshi did not wash Bob's car*. Assuming that *pro* is a phonologically empty counterpart of an overt pronoun, the *pro* analysis does not explain why (2b) has the sloppy reading in addition to the strict one.

In the literature, the argument ellipsis approach (see Oku 1998 and Saito 2007) explains how the sloppy reading in (2b) is derived.¹ Under this approach, an argument is assumed to be directly deleted, and the null argument in (2b) is created, as shown in (3).

(3) [_{TP} Hiroshi_i-TOP [_{NP} ~~self's car~~] wash-NEG-PAST]

The elliptical site in (3) contains a self-anaphor *zibun-no kuruma* ‘self’s car’, so that the availability of the sloppy reading is straightforwardly explained. In addition to instances where a null argument is in object position, it is well known that a null argument in subject position can be dropped, as in (4b) (see Oku 1998 and Saito 2007).

- (4) a. Taro-wa [zibun-no teian-ga saiyoosareru to] omotte-iru.
 Taro-TOP self-GEN proposal-NOM accepted. that think-PRS
 ‘Taro thinks that his proposal will be accepted.’
 b. Mary-mo [Δ saiyoosareru to] omotte-iru.
 Mary-also accepted that think-PRS
 ‘Mary also her / his proposal will be accepted.’

The self-anaphor *zibun-no teian* ‘self’s proposal’ is included in the ellipsis site in (4b), and therefore the sloppy reading is possible. The availability of this reading indicates that a null argument in subject position can also be derived from the argument ellipsis.

Keeping this in mind, let us consider disjunction in Japanese. Goro (2007) and Shibata (2015) show that the disjunction *ka* ‘or’ is always interpreted exclusively.

- (5) Taro-wa [Mami ka Saki-o] tazune-nakat-ta.
 Taro- TOP Mami or Saki- ACC visit- NEG - PST
 ‘Taro didn’t visit Mami or Saki.’

In (5), the use of disjunction is accepted when exactly one of the disjuncts is true: *Taro didn’t visit Mami OR Taro didn’t visit Saki*. However, disjunction is rejected when neither disjunct is true: *Taro didn’t visit Mami*

¹ An alternative approach to null arguments in Japanese is V-stranding VP-ellipsis (see Otani and Whitman 1991; Funakoshi 2017), where a null argument is derived from overt V-to-T movement followed by VP-ellipsis. However, it has been shown that some data pose an issue for the V-stranding VP-ellipsis analysis (see Oku 1998; Saito 2007, 2017; Sakamoto 2015, 2016). Therefore, I refer only to the argument ellipsis analysis of null arguments in Japanese.

and *Taro didn't visit Saki*. In this paper, the former interpretation is called the disjunctive reading (DR) and the latter is called the conjunctive-like reading (CR).

Moreover, when a disjunctive phrase is in subject position, the interpretation of the disjunction is the same as when the disjunction is in object position. For example, let us consider (6).

- (6) *Kyou-no pati-de-wa [Taro ka Hanako-ga] ringo-o tabe-nakat-ta.*
 Today-GEN party-by- TOP Taro or Hanako-NOM apple-ACC eat-NEG-PST
 'At today's party, Taro or Hanako didn't eat an apple.'

The sentence in (6) is accepted only in the following context: *At today's party, Taro didn't eat an apple OR Hanako didn't eat an apple*. This illustrates that only the DR is possible for the disjunctive phrase. Interestingly, once the disjunctive element is dropped, the interpretation of the disjunction changes (see Funakoshi 2017; Saito 2017; Sakamoto 2015, 2016; Maeda 2019).

- (7) a. *Taro-wa [Mami ka Saki-o] tazune-ta.*
 Taro-TOP Mami or Saki-ACC visit-PST
 'Taro visited Mami or Saki.'
 b. (Demo,) *Ziro-wa Δ tazume-nakat-ta.*
 (However,) Ziro- TOP visit-NEG-PST
 Lit: '(However,) Ziro did not visit Δ'. (*DR/CR)

With (7a) as its antecedent, the disjunctive phrase *Mami ka Saki* 'Mami or Saki' is deleted in (7b). (7b) can only mean that Ziro visited neither Mami nor Saki. Thus, although a disjunctive phrase is always interpreted with the DR when it occurs explicitly, as in (5), (7b) shows that the DR is not available when the disjunctive phrase is null.

Next, we move on to the case of an elided disjunction in subject position. It is not always the case that an elided disjunctive phrase is not interpreted with the DR. For instance, (8) presents a null disjunction in subject position.

- (8) a. *Kinou-no pati-de-wa [Taro ka Hanako-ga] ringo-o tabe-ta.*
 Yesterday-GEN party-by- TOP Taro or Hanako- NOM apple- ACC eat- PST
 'At yesterday's party, Taro or Hanako ate an apple.'
 b. (Demo,) *Kyou-no pati-de-wa Δ ringo-o tabe-nakat-ta.*
 (However,) Today-GEN party-by- TOP apple- ACC eat-NEG-PST
 Lit: '(However,) at today's party, Δ didn't eat an apple.' (DR/CR)

In (8b), the subject position including the disjunctive phrase *Taro ka Hanako* ‘Taro or Hanako’ is dropped. In contrast to (7b), the sentence in (8b) can mean not only that at today’s party, neither Taro nor Hanako ate an apple, but also that at today’s party, Taro didn’t eat an apple OR Hanako didn’t eat an apple. Thus, (8b) demonstrates that the DR is available even in the elided disjunctive phrase.

This paper offers a possible explanation in response to the following questions on the null arguments in (7b) and (8b):

(9) Question

- a. What is the deletion site (= Δ) derived from?
- b. Where do the different interpretations of overt and covert disjunction come from?

The rest of the paper is organized as follows. In Section 2, I review previous studies on the unavailability of the DR when a disjunctive phrase is dropped. These analyses can account for the unavailability of the DR, but I point out that they are not sufficient to explain the accessibility of the DR in a deleted disjunction in subject position. In order to explain the interpretation of null disjunction, I argue that the disjunction without a silent exhaustive operator (Chierchia et al. 2012) must be copied onto an empty slot in the second sentence. In Section 3, I claim that the argumentation is closely related to Morphological Merger (MM) (Shibata 2015). Then, in Section 4, I show the analysis of the null arguments in (7b) and (8b). Section 5 is the conclusion of this paper.

2 Previous research on null disjunction

Saito (2017) claims that the unavailability of the DR in a null disjunctive phrase can be explained by an LF-copy analysis. Let us consider the example of null disjunction in (7), repeated here as (10).

- (10) a. Taro-wa [Mami ka Saki-o] tazune-ta.
 Taro-TOP Mami or Saki-ACC visit-PST
 ‘Taro visited Mami or Saki.’
- b. (Demo,) Ziro-wa [e] tazume-nakat-ta.
 (However,) Ziro- TOP visit-NEG-PST
 Lit: ‘(However,) Ziro did not visit [e].’ (*DR/CR)

It is generally assumed that the LF-copy analysis is that the argument is null in overt syntax, and it is copied and covertly merged into an empty site (= [e]) at LF from a linguistic context without its phonological fea-

tures (see Oku 1998; Sakamoto 2016). To account for the unavailability of the DR, Saito (2017) proposes that any syntactic object creating an A'-chain cannot be copied onto an empty site. The phrase with *ka* in (10a) must undergo movement like Quantifier Raising (QR), forming an A'-chain between the landing site of the disjunctive phrase and its lower copy. Therefore, the phrase cannot be copied onto the empty slot in (10b). That is why Saito's analysis accounts for the question of why the DR is unacceptable in the null disjunction in (10b).

As we observed in Section 1, even when a disjunctive phrase is deleted, the DR is still available in (8b). Below, (8) is repeated as (11).²

- (11) a. Kinou-no pati-de-wa [Taro ka Hanako-ga] ringo-o tabe-ta.
 Yesterday-GEN party-by- TOP Taro or Hanako- NOM apple- ACC eat- PST
 'At yesterday's party, Taro or Hanako ate an apple.'
 b. (Demo,) Kyou-no pati-de-wa [e] ringo-o tabe-nakat-ta.
 (However,) Today-GEN party-by- TOP apple- ACC eat-NEG-PST
 Lit: '(However,) at today's party, [e] didn't eat an apple.'(DR /CR)

I claim that Saito's analysis makes a wrong prediction. Under his explanation, the phrase with disjunction must undergo movement like QR, so that the phrase creates an A'-chain. Yet in this case, since any syntactic element forming the A'-chain cannot be copied onto the empty slot, it is not obvious why the DR is acceptable in (11b). To explain the DR's unavailability in (10b) and acceptability in (11b), modifying Saito (2017), I propose that disjunction without a silent exhaustive operator must be copied onto an empty site. Furthermore, I argue that this proposal is closely linked to MM (Shibata 2015). Section 3 introduces Shibata's analysis in detail.

3 Explanation of the unambiguity of interpretation in disjunction under Shibata (2015)

3.1 Morphological Merger (MM)

Shibata (2015) attempts to explain why an overt Japanese disjunction is interpreted only with the DR. An illustrative example is presented in (5), repeated as (12).

- (12) Taro-wa [Mami ka Saki-o] tazune-nakat-ta.

² Actually, Sakamoto (2016) showed the null disjunction in subject position was always interpreted with the DR. I re-examined (11) with three native speakers of Japanese (all linguists); all of them accepted (11) in the contexts of DR and CR. In this paper, I adopt the judgment.


Taro- TOP Mami or Saki- ACC visit- NEG-PST
 ‘Taro didn’t visit Mami or Saki.’

Shibata (2015) claims that MM (Halle and Marantz 1993) derives a Japanese complex predicate (V-v-neg) from a predicative head. Moreover, he proposes that MM must obey structural adjacency. The definitions of MM and structural adjacency are given in (13) and (14), respectively.

(13) Complex head formation through MM
 Head X and Y form one complex head through morphological merger only if X and Y are structurally adjacent. (Shibata 2015: 146)

(14) Structural adjacency
 X and Y are structurally adjacent only if there is no overt Z that is asymmetrically c-commanded by X and asymmetrically c-commands Y. (Shibata 2015: 146)

Shibata claims that structural adjacency should be satisfied before Vocabulary Insertion (VI), which is the operation of the insertion of phonetic information. VI happens while mapping the syntax to PF. For example, overt elements in a Spec position interfere with structural adjacency. Hence, the overt elements must go over the NegP, whereas non-phonetic elements do not need to move. The MM schema is shown in (15) (I have changed Shibata’s diagram slightly).³

(15) [_{CP} Subj [_{TP} [_{XP} Obj [_{NegP} [_{VP} Subj [_{VP} Obj [_v √ V] V] v] NEG]] T]]
 (V-v-Neg forms one complex predicate)

One may wonder why an object that is a complement of V must go over NegP. The concern seems to be plausible because the complement position does not disrupt the adjacency between V and v. One possible reason is that the complement position actually interferes with structural adjacency. Assuming that V can be divided into √ and V, and an object will be merged with the upper V, the object must undergo movement because the position must disrupt the adjacency between the v and the V which is merged with √. In this paper, I adopt the assumption that V is separated into √ and V.

³ The gray part means the part in question is its copy.


3.2 Trace conversion (Fox 2003)

Following Fox (2003), Shibata (2015) claims that when a focus element such as disjunction moves out of the negation, the focus operator acyclically sticks to the element, which is a process that converts copies into something that can be treated as traces in the semantics. Fox (2003) assumes that Trace Conversion consists of two syntactic operations. Variable insertion inserts a variable into the lower copy, and determiner replacement replaces a determiner with a definite description, as shown in (16).


(16) Trace Conversion

- a. Variable Insertion: (Det) Pred \rightarrow (Det) [Pred λ y (y = x)]
 - b. Determiner Replacement: (Det) Pred \rightarrow the [Pred λ y (y = x)]
- (Shibata 2015: 5)

The significant point to note is that Trace Conversion affects a DP but not adnominal elements. Shibata claims that Trace Conversion is applied to disjunction. Following Chierchia et al. (2012), Shibata (2015) argues that a DP-external silent exhaustive operator (O_{alt}) adjoins to the disjunction, and then the disjunction becomes interpreted exclusively. Chierchia et al. (2012) assume that the scalar items including disjunction are interpreted with the operator, and this operator acyclically attaches to disjunctive phrases. If the operator sticks to a disjunctive phrase before undergoing movement for MM, and then this phrase goes over negation, we can obtain the LF-representation roughly schematized in (17b) and (17c).

- (17) a. Taro-wa [Mami ka Saki-o] tazune-nakat-ta.
 Taro- TOP Mami or Saki- ACC visit- NEG - PST
 'Taro didn't visit Mami or Saki.'
- b. [_{NP} [_{vP} O_{alt} (Mami or Saki) V] NEG]
- c. [_{TP} Taro [_{vP} O_{alt} (Mami or Saki) [_{vP} O_{alt} (Mami or Saki) [_v \sqrt{V}] V] NEG] T]
- 

If a phrase with an adnominal element such as O_{alt} is based-generated inside a vP and it moves out of negation as in (17c), then the lower copy of the adnominal element cannot be affected by Trace Conversion. This derivation is not problematic for syntax, but the LF-representation is illegitimate for semantics. As an alternative derivation, Shibata (2015) claims that the operator (O_{alt}) acyclically adjoins to the disjunction, and then the lower copy is converted into variables. For example, (17) is derived as shown in (18).

- (18) a. [NegP [VP (Mami or Saki) V] NEG]
 b. [_{TP} Taro [_{NP} O_{ALT} (Mami or Saki) [_{NP} [_{VP} Mami or Saki [_v √V] V] NEG] T]
- 

This derivation is not problematic for syntax, and LF-representation is also desirable for semantics. In addition, since O_{ALT} acyclically sticks to the element (*Mami or Saki*) after movement, the lower copy of the element does not have O_{ALT}. Therefore, the lower copy can be converted into a trace. Since Japanese disjunction must take wide scope over negation and be understood exclusively, the interpretation of an overt disjunction is always the DR.

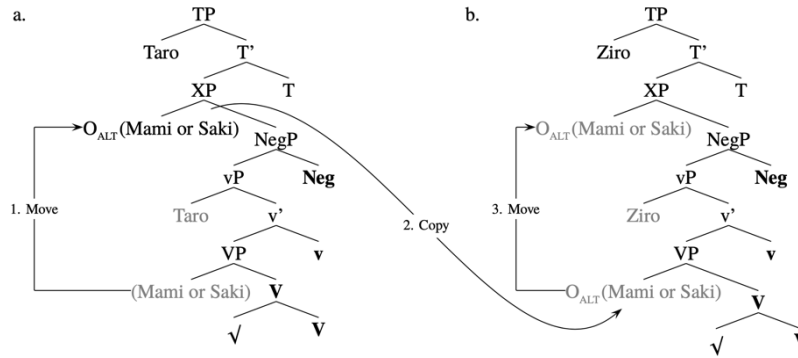
4 Analysis of null disjunctive phrases

This section explains why a null disjunction in object position is not interpreted exclusively. To illustrate, (10) is repeated as (19).

- (19) a. Taro-wa [Mami ka Saki-o] tazune-ta.
 Taro-TOP Mami or Saki-ACC visit-PST
 ‘Taro visited Mami or Saki.’
 b. (Demo,) Ziro-wa [e] tazume-nakat-ta.
 (However,) Ziro- TOP visit-NEG-PST
 Lit: ‘(However,) Ziro did not visit [e].’ (*DR/CR)

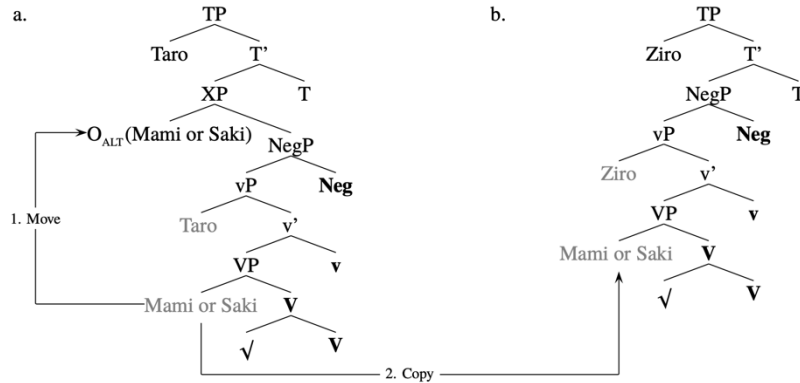
There are at least two derivations to copy the object *Mami ka Saki* onto an empty site in (19b). First, let us consider the case that the object with a DP-external silent exhaustive operator (O_{ALT}) is copied onto the empty slot in (19b). The derivation of (19) is illustrated in (20). The overt element in vP must move out of NegP because of structural adjacency (1: Move). The element with the operator is copied onto an empty slot in the second clause (2: Copy). Following Nakanishi (2006), I assume that focus operators such as O_{ALT} are basically sentential operators, so the operators must move to some position where they can take a proposition as a complement. When the object with the operator undergoes movement (3: Move), the object should leave its copy with the operator, as in (20b). Since the lower copy of the operator cannot be affected by Trace Conversion, the derivation should not be available.

(20)



Second, let us consider the derivation where the object without the focus operator is copied. The diagram is presented in (21).

(21)



As in (20a), in (21), the overt disjunctive phrase in vP must undergo movement for structural adjacency (1: Move). The element without the exhaustive operator is copied (2: Copy). Since the copied disjunctive phrase (*Mami or Saki*) does not have the operator, the disjunctive phrase is interpreted inclusively. Moreover, the copied phrase does not need to move because it is not pronounced like a trace. In this position, the disjunctive phrase takes narrow scope with respect to negation, and therefore

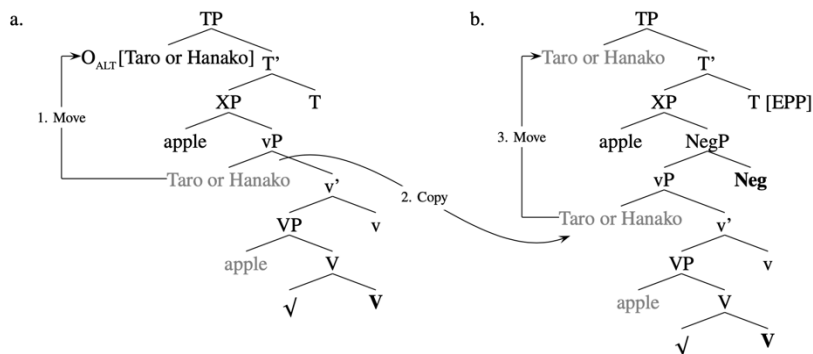
only CR is available, which is schematically represented as $\neg(p \vee q) \Leftrightarrow \neg p \wedge \neg q$.

Next, we move on to the case of null disjunction in subject position. Recall that a null disjunction in subject position has not only the CR but also the DR. Here, we repeat (8) as (22).

- (22) a. Kinou-no pati-de-wa [Taro ka Hanako-ga] ringo-o tabe-ta.
 Yesterday-GEN party-by- TOP Taro or Hanako- NOM apple- ACC eat- PST
 ‘At yesterday’s party, Taro or Hanako ate an apple.’
 b. (Demo,) Kyou-no pati-de-wa [e] ringo-o tabe-nakat-ta.
 (However,) Today-GEN party-by- TOP apple- ACC eat-NEG- PST
 Lit: ‘(However, at today’s party, [e] didn’t eat an apple.’(DR/CR)

There are also at least two possible derivations to copy the disjunctive phrase in the antecedent sentence onto an empty site in (22b). First, consider the case that the disjunctive phrase with the exhaustive operator is copied. As discussed in relation to (20), an element with the exhaustive operator must go to some position where it can take a proposition as a complement. Since such movement must leave its copy with the operator, the derivation is illicit because the lower copy cannot be converted into a trace correctly. Hence, we cannot help copying a disjunctive phrase without the operator onto the empty site in (22b). The derivation of (22) is illustrated in (23).

(23)



Saito (2007) notes that if overt and covert operations are closely connected, then even the copied element can check the EPP feature of T. If this is plausible, the subject moves to the domain of TP and checks the EPP, as shown in (23b). Assuming that A-movement does not give rise to recon-

struction effects (see Chomsky 1995), the copied disjunctive phrase must take wide scope with respect to negation. In addition, the disjunction without the exhaustive operator must be understood inclusively. The truth value of the disjunction is illustrated in Table 1, and accordingly, we accept the use of the disjunction in the following situations: *Taro AND Hanako didn't eat an apple + Taro OR Hanako didn't eat an apple.*

$\neg p$	$\neg q$	$\neg p \vee \neg q$
T	T	T
T	F	T
F	T	T
F	F	F

Table 1: Truth values of disjunction in Japanese

5 Conclusion

In this paper, I have offered a possible explanation in response to the questions in (24).

(24) Question

- a. What is the empty place (= [e]) derived from?
- b. Where do the different interpretations of overt and covert disjunction come from?

Saito (2017) claimed that Japanese disjunctive phrases are not allowed to be copied onto an empty site in a second sentence because these phrases must create an A'-chain. I pointed out that Saito's claim is too strong and showed that the DR is still available when the disjunctive phrase is dropped. Modifying Saito (2017), I proposed that disjunction without a silent exhaustive operator must be copied onto an empty slot in a second sentence. This proposal can explain the interpretation of null disjunction not only in object position but also in subject position.

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