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Abstract

This paper aims to propose an account of the scope between negation and VP-coordination in Japanese. We investigate a scope puzzle between negation and VP-coordination, which has been unexplained. We claim that VP-coordination and negation have three readings: (i) Suspended Affixation Reading (neg > VP1 > VP2); (ii) non-Suspended Affixation Reading (VP1 > neg > VP2); and (iii) the third reading (VP2 > neg > VP1), which has been unnoticed. This reading is yielded via the phase-based interpretation system, as well as De Morgan’s Law, which only applies to negation.

“I didn’t drink and drove a car” Neg Expresses Eccentric Triplets

Yusuke Yoda and Ryoichiro Kobayashi*

1 Introduction

This paper aims to propose an account on the scope between NEG(ation) and VP-coordination in Japanese. We investigate a scope puzzle between NEG and VP-coordination, which has been left unexplained. The crucial example we deal with in this paper is illustrated in (1).

- (1) John-ga sake-o nom-i kuruma-o unten-si-nak-at-ta.
John-NOM sake-ACC drink car-ACC drive-DO-NEG-COP-PAST
‘John did not drink sake and drove a car.’

In this paper, we would like to point out that the sentence in (1) can have the $VP_2 > NEG > VP_1$ reading, which previous studies (cf. Kato 2007) have unnoticed.

The organization of this paper is as follows. In section 2, we will review the conjugation pattern of Japanese verbs and its relation with VP-coordination. In section 3, we will claim that VP-coordination with NEG expresses an “eccentric third reading,” which is related to suspended affixation observed in VP-coordination. Then, section 4 overviews previous analyses of suspended affixation and we will propose our analysis on the unnoticed reading. Finally, in section 5, we provide an extension of our proposal and conclude that NEG behaves differently from other morphemes with respect to scopal interpretations. Section 6 is an overall summary of this paper.

2 Coordination in Japanese

2.1 Japanese Verbal Conjugation and its relation with Coordination

Japanese has two types of verb classes: One is vowel ending verbs such as *tabe-* ‘eat’. The other is consonants ending verbs such as *tat-* ‘stand’. The verbal conjugation is conditioned by the verb stem and its affix, as illustrated in (2).

- | | | |
|--------------|-----------------------|---------------------------|
| (2) | a. Vowel ending verbs | b. Consonant ending verbs |
| continuative | <i>tabe</i> | <i>tat-i</i> |
| non-past | <i>tabe-ru</i> | <i>tat-u</i> |
| negative | <i>tabe-nai</i> | <i>tat-anai</i> |
| past | <i>tabe-ta</i> | <i>tat-ta</i> |
| conditional | <i>tabe-tara</i> | <i>tat-tara</i> |
| provisional | <i>tabe-reba</i> | <i>tat-eba</i> |

Among the conjugation forms in (2), the continuative form, the continuative form followed by an affix *-te* and the (non)-past form with an coordinator *sosite* ‘and then’, forms apparent coordination, as in (3).

- | | | | | |
|--------|----------|----------|----------|----------------|
| (3) a. | Koji-ga | sake-o | nom-i | yopparat-ta. |
| | Koji-NOM | sake-ACC | drink-i | got.drunk-PAST |
| b. | Koji-ga | sake-o | non-de | yopparat-ta. |
| | Koji-NOM | sake-ACC | drink-te | got.drunk-PAST |

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- c. Koji-ga sake-o non-da sosite yopparat-ta.
 Koji-NOM sake-ACC drink-PAST and.then got.drunk-PAST
 ‘Koji drank sake and got drunk.’

2.2 What does the Coordination in Japanese Look Like?

Now let us move on to more detailed discussions on Coordination in Japanese. Takano (2004) (see also Hirata 2006) claims that bare-verbal coordination is the genuine verb coordination. Moreover, he claims that, following Carlson (1987), genuine verbal coordination must involve multiple independent events. If a sentence involves coordination, the “sentence internal reading” of *different* must be licensed. Details aside, it is possible for the sentence in (4) to obtain two distinct readings.

- (4) Bob and Alice attend different classes.
 (5) a. Bob and Alice attend different class from last year.
 b. Bob attends Biology 101 and Alice attends Philosophy 799.

The first reading illustrated in (5a) is called the “sentence external reading” of *different*, which involve comparison between something obviously stated within a sentence and something contextually determined. On the other hand, in the second reading (5b), comparison is made between the two items stated within a sentence. This second reading is called the “sentence internal reading” of *different*. Moreover, the “sentential internal reading” is available when a sentence involves two distinct events established by plurality or coordination, according to Carlson.

Following Carlson’s (1987) argument, Takano shows that the “sentence internal reading” of *betsubetsu-no* ‘different’ is licensed in bare-verbal coordination, but not in others as shown in (6).

- (6) a. Taro-ga betsubetsu-no ronbun-o kopi-si fairu-si-ta.
 Taro-NOM different-GEN paper-ACC copy-do file-do-PAST
 ‘Taro copied and filed different papers.’
 ‘Taro copied different papers and filed different papers.’
 b. Taro-ga betsubetsu-no ronbun-o kopi-si-te fairu-si-ta.
 Taro-NOM different-GEN paper-ACC copy-do-te file-do-PAST
 ‘*Taro copied and filed different papers.’
 ‘Taro copied different papers and filed different papers.’
 c. Taro-ga betsubetsu-no ronbun-o kopi-si sosite fairu-si-ta.
 Taro-NOM different-GEN paper-ACC copy-do and.then file-do-PAST
 ‘*Taro copied and (then) filed different papers.’
 ‘Taro copied different papers and (then) filed different papers.’

As in (6), among the three types of coordination mentioned above, only the bare-verb coordination licenses the “sentential internal reading” of *different*, and thus, Takano concludes that the bare-verbal coordination is the only genuine verbal coordination.

3 Puzzle: Introducing NEET, the Unexpected Third Reading with NEG

In this section, we will look at an interesting scope puzzle: That is scopal interactions between several types of affixes and VP-coordination. Firstly, we will look at the causative morpheme. The VP-coordination with a causative morpheme in (7a) has two readings. One is CAUS > V1 > V2 and the other is V1 > CAUS > V2 reading. The point here is that another logical possibility, the V2 > CAUS > V1 reading, is unavailable. Unlike the causative, NEG with VP exhibits different patterns as illustrated in (7b). In the case of NEG, the third reading; V2 > NEG > V1, which is absent in (7a), suddenly becomes available.

- (7) a. John-ga kinko-o ake kane-o nusum-ase-ta.
 John-NOM safety.box-ACC open money-ACC steal-CAUS-PAST
 ‘John had someone unlock the safety box and steal money.’
 ‘John unlocked the safety box and had someone steal money.’

- ‘*John had someone unlock the safety box and John stole the money.’
- b. John-ga sake-o nom-i kuruma-o unten-si-nak-at-ta.
 John-NOM sake-ACC drink-i car-ACC drive-do-NEG-be-PAST
 ‘John neither drink sake nor drove a car.’
 ‘John did drink sake and he didn’t drive a car.’
 ‘John did not drink sake and he drove a car.’

In the propositional logic sense, coordination of VP1 and VP2, which we consider to be propositions (cf. Kato 2007), should have three distinct readings from the De Morgan’s Law, which is schematically shown as $\neg(p \wedge q) \Leftrightarrow \neg p \vee \neg q$. Thus, we claim that this is the source of three different readings in (7b), which we will turn to in the following sections.

The puzzle here is why a causative morpheme does not allow the third reading, *V2 > CAUS > V1, but NEG does allow it, V2 > NEG > V1. We will investigate why only NEG Expresses the Ec-centric Triplets (henceforth, NEET) from next section. Before that, some notes on suspended affixation, which is widely observed among Altaic languages (Konfilt 1996 2012, Kabak 2007, Nishiyama 2016, Yoda 2015 among others) are in order.

4 Suspended Affixation and Scope Relations

4.1 Suspended Affixation in Turkish

The most well-known examples of Suspended Affixation are from Turkish (Konfilt 1996, 2012, Kabak 2007 among others) in (8).

- (8) Limon ve portakal-lar.
 Lemon and orange-PL
 ‘lemon and oranges’
 ‘lemons and oranges’ (Konfilt 2012)

According to Konfilt (2012), the scope of -lar ‘PL’ is ambiguous in (8). The first reading where the plural affix takes scope over only the second conjunct is called the non-suspended affixation reading, whereas the second reading where the plural affix takes wide scope over both the first and second conjuncts is called the suspended affixation reading. Suspended affixation is not limited to nominal coordination. An affix can also be suspended in verbal coordination as illustrated in (9).

- (9) [Ali-nin ördeg-i kızar-t] -ip [krema -yı don-dur]
 Ali-GEN duck-ACC roast-CAUS -and cream-ACC freeze-CAUS
 -ma -sın -i söyle-di-m.
 NMR -3.SG -ACC tell-PAST-1.SG
 ‘I said for Ali to roast duck and freeze the ice cream.’

In (9), *-ma* is used as nominalizer forming a gerund, or as a resultative affix, which forms a result nominal. In both nominal and verbal cases, the suspended affixation reading is yielded through the ATB-movement of affixes, as in (10a). The structure involves an affix within each conjunct. Hence, it is possible for an affix to take scopes over within both conjuncts. However, in the non-suspended affixation reading, the affix is interpreted only in the second conjunct. This suggests that the affix is syntactically present only inside the second conjunct, and the first conjunct does not have it, as in (10b).

- (10) a. [_p XP-affix] and [_q YP-affix] affix
 b. [_p XP] and [_q YP-affix]

4.2 Japanese Suspended Affixation

Recently, Nishiyama (2016) and Yoda (2015) note that Japanese VP-coordination also provides environments for Suspended affixation with NEG, an aspectual verb, and a causative morpheme. In all cases illustrated in (11), the first reading is the non-suspended affixation reading, where the affix takes scope over only the second conjunct. Another reading is the suspended affixation reading, where the affix takes wide scope over entire coordinated items.

- (11) a. Taro-ga uta-i odor-a nak-at-ta.
 Taro-NOM sing dance-a NEG-COP-PAST
 ‘Taro sang and did not dance.’
 ‘Taro neither sang nor danced.’
- b. Taro-ga uta-i Jiro-ga odor-i hajime-ta.
 Taro-NOM sing Jiro-NOM dance start-PAST
 ‘Taro sang and Jiro began to dance.’
 ‘Taro began to sing and Jiro began to dance.’
- c. Taro-ga betsubetsu-no ronbun-o kopi-si fairu-sase-ta.
 Taro-NOM different-GEN paper-ACC copy-do file-CAUS-PAST
 ‘Taro copied and filed different papers.’
 ‘Taro copied different papers and filed different papers.’

Among the three, in this paper, we will focus on the suspended affixation of NEG and CAUS.

According to Nishiyama (2016) and Yoda (2015), suspended affixation of CAUS obtains ambiguous readings from two different underlying structures, as shown in (12). The output from the structure (12)a is the suspended affixation reading; CAUS > VP₁ > VP₂, and the other is the non-suspended reading; VP₁ > CAUS > VP₂.

- (12) a. John-ga ronbun-o [_{VP} [_p kopi-sase] [_q fairu-sase]]-ta.
 John-NOM paper-ACC copy-CAUS file-CAUS-PAST
 ‘John had someone copies papers and files papers.’
- b. John-ga ronbun-o [_p kopi-si] [_q fairu-sase]-ta.
 John-NOM paper-ACC copy-do file-CAUS-PAST
 ‘John copies papers and had someone files papers.’

From the structure illustrated in (12a), the CAUS moves out in a ATB-fashion from VP-coordination and forms a structure like (13), which yields the interpretation, CAUS > VP₁ > VP₂.

- (13) John-ga ronbun-o [_{VP} [_p kopi-sase] [_q fairu-sase]] -sase-ta.
 John-NOM paper-ACC copy-CAUS file-CAUS CAUS-PAST
 ‘John had someone copy and file papers.’

This accounts for the absence of the reading VP₂ > CAUS > VP₁. Suppose that we have an underlying structure in (14a). The movement of CAUS in (14b) only from out of the first conjunct violates the Coordinate Structure Constraint (Ross 1967).

- (14) a. John-ga ronbun-o [_{VP} [_p kopi-sase] [fairu-si]-ta.
 John-NOM paper-ACC copy-CAUS file-do PAST
 ‘John had someone copied paper and John filed paper.’
- b. John-ga ronbun-o [_{VP} [_p kopi-sase] [fairu-si]-sase-ta.
 John-NOM paper-ACC copy-CAUS file-do-CAUS-PAST
 ‘John had someone copied paper and John filed paper.’

The derivation of the suspended affixation reading is explained by the distributive law in the propositional logic. The distributive law is schematically shown as $a(p \wedge q) \Leftrightarrow ap \wedge aq$. Hence, the reading VP₂ > CAUS > VP₁ is excluded in (13). This is also true with the aspectual verbs, which we do not discuss in this paper.

4.3 Neg Expresses Eccentric Triplets

Unlike CAUS just we reviewed in the previous section, NEG expresses eccentric triplets (NEET). That means VP-coordination with NEG is three-way ambiguous. This, we call NEET, is unexpected and we need to provide why this is possible only with NEG. Here, we replicate the crucial example.

- (15) John-ga sake-o nom-i kuruma-o unten-si-nak-at-ta.
 John-NOM sake-ACC drink car-ACC drive-do-NEG-COP-PAST
 - a. John neither drunk sake and drove a car.
 - b. John drunk sake and did not drive a car.
 - c. John did not drink sake and drove a car.

The first reading is the same as the one observed with CAUS in (12), so we assume the same structure here, as in (16).

- (16) John-ga [_{VP} [_p sake-o nom-~~nak~~] [_q kuruma-o unten-si-~~nak~~]-nak-at-ta.]
 John-NOM sake-ACC drink-NEG car-ACC drive-do NEG-COP-PAST
 ‘John didn’t drink sake and drive a car.’

Crucially, in the underlying structure of the suspended affixation reading in (16), both conjuncts contain NEG inside and thus events denoted by both conjuncts are negated. Hence, the reading in which NEG takes scope over both conjuncts; $\neg > VP_1 > VP_2$ is available. Needless to say, the sentence in (15) can also have the non-suspended affixation reading; $VP_1 > \neg > VP_2$, as in (17).

- (17) John-ga [_{VP} [_p sake-o nom-i] [_q kuruma-o unten-si-nak-at] -ta.
 John-NOM sake-ACC drink car-ACC drive-do-NEG-COP-PAST
 ‘John drunk sake and did not drive a car.’

Of course, the following structure in (18) is simply impossible, due to violation of CSC (cf. (14b)).

- (18) John-ga [_{VP} [_p sake-o nom-~~a-nak~~] [_q kuruma-o unten-si]-nak-at-ta.
 John-NOM sake-ACC drink-NEG car-ACC drive-do -NEG-COP-PAST
 ‘John did not drink sake and drove a car.’

Interestingly, the structurally impossible reading; $VP_2 > NEG > VP_1$ becomes suddenly possible in the case of negation. We propose that this NEET is derived via the De Morgan’s Law.

$\neg p$	\vee	$\neg q$
1	1	1
1	1	0
0	1	1
0	0	0

Table 1: De Morgan’s Laws

It derives three possible readings from the following structure. In the first reading in (15a), the structure is ambiguous between following two illustrated in (19).

- (19) a. John-ga [_{VP} [_p sake-o nom-~~nak~~] [_q kuruma-o unten-si-~~nak~~]-nak-at-ta.]
 John-NOM sake-ACC drink-NEG car-ACC drive-do neg-COP-PAST
 - b. John-ga [_{VP} [_p sake-o nom] [_q kuruma-o unten-si] nak-at-ta.]
 John-NOM sake-ACC drink car-ACC drive-do NEG-COP-PAST
 ‘John didn’t drink sake and drive a car.’

However, either case predicts NEG scopes over entire VP-coordination. The third row in the Table 1 is also syntactically predictable, since this is the case where only the second conjunct is negated and such a reading is derived by the non-suspended affixation reading. Crucial here is that, the De Morgan's Law introduces the reading illustrated in the second row as it entailment. This cannot be derived in syntax. Thus we assume that the entailed reading is semantico-pragmatic in nature. De Morgan's law is uniquely available with NEG, never in other environments, say with CAUS. We conclude that the NEET is suddenly available at the level of semantico-pragmatic interpretations.

5 Extension: No NEET with an Intervener

5.1 Intervention Effects with CAUS

We observed that NEET holds true only if the VP-coordination involves NEG. As the following data indicates, NEET induced by De Morgan's Law suddenly becomes unavailable with intervention of CAUS. The following instance has both CAUS and NEG. The latter is structurally higher than the former. In this case, the NEET is unavailable as in (20).

- (20) Koji-wa Aoi-ni [_{VP} [_p piano-o naraw-i] [_q eigo-o benkyoo]
 -sase]-nak-at-ta.
 Koji-TOP Aoi-DAT piano-ACC learn English-ACC study
 CAUS-NEG-COP-PAST
 a. 'Koji neither had Aoi learn piano nor had her study English.'
 b. 'Koji had Aoi learn piano and did not had her study English.'
 c. '*Koji had Aoi learn piano and did not had her study English.'

Why cannot we have the third reading in (20)? Our answer is that the first reading NEG > CAUS > VP₁ > VP₂ is yielded by the suspended affixation of CAUS, and thus, the available structures are those in (21a) and (21c), but not in (21b), since CAUS in the structure (21b) cannot be extracted in the ATB-fashion. Moreover, in the case of (21c), by assumption, the CAUS morpheme is an exponent of *v* and it closes off a phase, and at the point of VP-coordination, the available reading is the suspended affixation reading; CAUS > VP₁ > VP₂ or the non-suspended affixation reading; VP₁ > CAUS > VP₂. Since NEG cannot enter into the previous phase, which has already been closed off. Thus, NEG cannot trigger the NEET here.

- (21) a. [_p V-CAUS-NEG] & [_q V-CAUS-NEG] ⇔ ¬ V₁-CAUS ∧ ¬ V₂-CAUS
 b. *~~[_p V-CAUS]~~ & [_q V-CAUS] -CAUS-NEG : improper head movement
 c. [_{vP} [_p V] & [_q V] -CAUS]-NEG

5.2 Special Status of NEG

We further observe the interaction between NEG and a modal operator. Here, we take the sentences that involve *-soo* 'seem', which, we assume, introduces speaker's intentionality on C⁰. Note that *-soo* can occur either immediately before NEG or after NEG, as illustrated in (22).

- (22) a. taka -soo-jya-na-i
 expensive -seem-COP-NEG-pres
 'not seem expensive'
 b. taka -ku -na -sa -soo-da
 expensive -COP -NEG -nmr -seem-COP.pres
 'seem not expensive'

Now, let us look at the *soo*-NEG order first. In this case, three readings are available but the NEET is not observed.

- (23) Ryo-wa migite-ni wain-o moch-i
 Ryo-TOP right-hand-DAT wine-ACC hold
 hidari-te-ni chiizu-o moch soo-jya-nak-at-ta.
 left-hand-DAT cheese-ACC hold-seem-NEG-be-PAST
 ‘(Lit.) Ryo did not seem to have wine on his right hand and cheese on his left hand.’

The schematic representation of (23) is $\neg(\diamond(p \wedge q))$. In this case, due to the phasehood of modal operator, \diamond , the NEG cannot interact with the first and the second conjunct, p and q for their interpretation, and therefore, De Morgan’s Law cannot be applied. Hence, the available readings are only ones illustrated in (24a-c).

- (24) a. SA-Reading: $\neg\diamond VP_1 \wedge \neg\diamond VP_2$
 b. Non-SA Reading 1: $\diamond VP_1 \wedge \neg\diamond VP_2$
 c. Non-SA Reading 2: $VP_1 \wedge \neg\diamond VP_2$
 d. Unavailable NEET: $\neg\diamond VP_1 \wedge \diamond VP_2$

On the other hand, let us look at the *NEG-soo* order in (25); $\diamond(\neg(p \wedge q))$, which is minimally different from (23).

- (25) Ryo-wa migite-ni wain-o moch-i
 Ryo-Top right-hand-DAT wine-ACC hold
 hidari-te-ni chiizu-o mota na-soo-DAT-ta.
 left-hand-DAT cheese-ACC hold-NEG-seem-COP-PAST
 ‘(Lit.) Ryo seem not to have wine on his right hand and cheese on his left hand.’

In this case all of the readings illustrated in (24), even including $\neg\diamond VP_1 \wedge \diamond VP_2$ reading suddenly become available. We claim that this is due to the NEG being structurally inside the modal operator, \diamond . Thus, we assume that it can interact with VP-coordination without violating the phase impenetrability condition, and De Morgan’s Law can be applied.

- (26) a. SA-Reading: $\diamond\neg VP_1 \wedge \diamond\neg VP_2$
 b. Non-SA Reading 1: $\neg VP_1 \wedge \diamond\neg VP_2$
 c. Non-SA Reading 2: $VP_1 \wedge \diamond\neg VP_2$
 d. Unavailable NEET: $\diamond\neg VP_1 \wedge \diamond VP_2$

6 Conclusion

In this paper, we observed VP-coordination in Japanese and pointed out the existence of an unexpected reading, which is induced by scopal interactions between NEG and VP-coordination. We also claimed that this reading is uniquely observed with NEG, but not with other affixes, such as CAUS. This unexpected reading is yielded by De Morgan’s Law, but it is available only when NEG is in the same phase domain with VP-coordination.

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