

【Forum】

Differentiating Subjects from VP-adjuncts: A Psycholinguistic Case Study of *kara*-marked NPs

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Abstract: Previous studies (e.g., Cho 1995, Inoue 2002, Ito 2001, Kishimoto 2012) suggest that some NP-*kara* phrases in Japanese can be considered as sentence subjects. Like NP-*ga*, some NP-*kara* phrases can trigger subject honorification and can be the antecedent of the reflexive pronoun *zibun* ‘self’. Additionally, Ueda (2003) and Kishimoto (2012), among others, argue that a *kara*-marked subject may stay in its thematic position, Spec-vP, rather than moving to a derived Spec-TP position. However, it is also possible to analyze *kara*-marked NPs as VP-adjuncts, based on the fact that *-kara* is a postposition typically used as the head of an adjunct. To differentiate between these possibilities, the present study conducted an experiment centered on sentences whose subjects are marked with either *-ga* or *-kara*. The results showed that scrambling effects (i.e., a significant difference in processing speed between sentences with two alternative word orders) were observed in sentences where subjects were marked by *-ga*, but not in sentences in which the corresponding NPs were marked by *-kara*. An experimental study by Koizumi and Tamaoka (2006) indicates that VP-adverbs have two canonical positions, one before the canonical object position and one after that position (i.e., AdvOV and OAdvV; *Adv* refers to an adverb). Given this observation, the lack of scrambling effects with NP-*kara* suggests that native Japanese speakers may understand NP-*kara* as a VP-adjunct, generated either before or after an object inside the VP.

Key words: *ga*- and *kara*-marked subjects, VP-internal subject hypothesis, scrambling effects, sentence processing, VP-adjunct

1. Introduction

In modern Japanese, a grammatical subject is usually marked by the nominative case *-ga* (NP-*ga* hereafter), as exemplified in (1a).¹ However, some descriptive studies (e.g., Cho 1995, Ito 2001) suggest that in some cases, as shown in (1b), the grammatical subject can be marked with the ablative case (ABL) *-kara* (NP-*kara* hereafter).

¹ The following abbreviations are used in the glosses of examples: ABL (ablative), ACC (accusative), CL (classifier), CAUS (causative), DAT (dative), GEN (genitive), NOM (nominative), SH (subject honorification), TOP (topic).

- (1) a. Kootyoo **ga** syoomeisyo o watasi-ta.
 principal NOM certificate ACC hand.over-PAST
 ‘The principal handed over the certificate.’
- b. Kootyoo **kara** syoomeisyo o watasi-ta.
 principal ABL certificate ACC hand.over-PAST
 ‘The principal handed over the certificate.’

In (1b), *kootyoo-kara* can be understood as the subject, because superficially at least, it appears in the same position as *kootyoo-ga*, the subject of (1a). More simply, we can consider the subject marker *-ga* to be replaced by the morpheme *-kara*. This phenomenon is called the *ga-kara* ‘NOM-From’ alternation in Ueda (2003). However, we should note that from the perspective of generative Japanese linguistics, *-ga* is a case marker, while *-kara* is a postposition. Therefore, as a postposition, *-kara* can play roles that are usually reserved for prepositions in English, such as indicating the “source” (indicated by the preposition *from* in English) or “cause” (indicated by *because* in English) of an event. Although the *ga-kara* alternation makes a *kara*-marked NP appear to be a subject, its status as a postpositional phrase (PP) muddies the waters. It is also possible to analyze *kara*-marked NPs as VP-adjuncts. Thus, it is unclear whether a *kara*-marked NP displays signs of true subjecthood.² The present study investigated the processing of sentences with *kara*-marked NPs by native Japanese speakers to clarify whether a *kara*-marked NP is a subject or not.

2. Previous Studies: *Kara*-marked NPs as Subjects

Previous studies (e.g., Cho 1995, Inoue 2002, Ito 2001) point out that the *ga-kara* alternation must satisfy two conditions. First, the head verb of the sentence must represent an action that provides something or conveys something to someone. For instance, these could be two-argument verbs such as *sikar-u* ‘scold’ and *home-ru* ‘praise,’ or three-argument verbs such as *okur-u* ‘send’ and *yuzur-u* ‘pass ... on (to).’ Second, *kara*-marked NPs must have an agent thematic role. When these two conditions are satisfied, the subject of a sentence can be marked either with the nominative case marker *-ga* or with the ablative postposition *-kara*.

If the *ga-kara* alternation is allowed, *kara*-marked NPs will have a syntactic function similar to that of *ga*-marked NPs. This provides key evidence in support of the claim that *kara*-marked NPs can be treated as subjects. First, as shown in (2), both NP-*ga* and NP-*kara* can be the antecedents of the reflexive pronoun *zibun* ‘oneself.’ In addition, as illustrated in (3), both NP-*ga* and NP-*kara* can trigger subject honorification. It therefore seems reasonable to treat a *kara*-marked NP of this kind as a subject.

² English also allows what appears to be an appositional (prepositional) phrase subject (e.g., ‘After four would suit me fine.’)

- (2) a. Taroo *ga* Hanako *ni* zibun *no* himitu *o*
 Taroo NOM Hanako DAT oneself GEN secret ACC
 hanasi-ta.
 tell-PAST
 ‘Taroo told Hanako his secret.’
- b. Taroo *kara* Hanako *ni* zibun *no* himitu *o*
 Taroo ABL Hanako DAT oneself GEN secret ACC
 hanasi-ta.
 tell-PAST
 ‘Taroo told Hanako his secret.’
- (3) a. Tanaka-sensei *ga* Taroo *ni* sono koto *o*
 Prof. Tanaka NOM Taroo DAT that thing ACC
 o-hanasi-ni nat-ta.
 SH-tell-SH-PAST
 ‘Professor Tanaka told Taroo that thing.’
- b. Tanaka-sensei *kara* Taroo *ni* sono koto *o*
 Prof. Tanaka ABL Taroo DAT that thing ACC
 o-hanasi-ni nat-ta.
 SH-tell-SH-PAST
 ‘Professor Tanaka told Taroo that thing.’

Although NP-*ga* and NP-*kara* function similarly, it has been argued that they are generated in different syntactic positions (e.g., Inoue 2002, Kishimoto 2012, Ueda 2003). As *-ga* is a structural case, *ga*-marked subjects are often assumed to move to a derived position (Spec-TP) from their thematic position (Spec-vP). Considering *kara*-marked NPs as subjects raises the question of whether *kara*-marked NPs also move to Spec-TP, that is, whether sentences with NP-*ga* and those with NP-*kara* have parallel structures and are comparable in terms of syntactic derivation. Inoue (2002), Ueda (2003), and Kishimoto (2012) suggest that *kara*-marked subjects remain in the vP-internal subject position. One piece of evidence for this comes from causative sentences. In Japanese causative sentences like those in (4), a VP-adverb, but not a TP-adverb or CP-adverb, can occur in the embedded clause denoting the caused event (Koizumi 1991). In (4b, c), the adverbs may only be associated with the matrix causative verb.

- (4) a. VP-adverb
 Minori *ga* [Megumi *ni* yukkuri hon *o*
 Minori NOM Megumi DAT slowly book ACC
 yom]-ase-ta.
 read-CAUS-PAST
 ‘Minori made [Megumi read a book slowly].’
- b. TP-adverb
 Minori *ga* Megumi *ni* kinoo hon *o*
 Minori NOM Megumi DAT yesterday book ACC
 yom-ase-ta.
 read-CAUS-PAST

- *‘Minori made [Megumi read a book yesterday].’
 ‘Minori made [Megumi read a book] yesterday.’
- c. CP-adverb
 Minori *ga* Megumi *ni* *saiwai* *hon* *o*
 Minori NOM Megumi DAT fortunately book ACC
yom-ase-ta.
 read-CAUS-PAST
 *‘Minori made [Megumi read a book fortunately].’
 ‘Minori made [Megumi read a book] fortunately.’

This suggests that the embedded clause of causative sentences of this kind is not a TP or CP, but rather a vP (Harley 2008, Koizumi 1991). Not surprisingly, the embedded subject cannot be marked with the nominative *-ga*, which needs to be licensed by T. More interestingly, it may be marked with *-kara*, as shown in (5) (Ueda 2003).

- (5) Taroo *wa* [*watasi* *kara* Mary *ni* *kanozyo* *no* *yoozyoo*
 Taro TOP I ABL Mary DAT her GEN condition
o *setumei-s]-ase-ta.*
 ACC explain-do-CAUS-PAST
 ‘Taro made me explain her condition to Mary.’

Ueda (2003) considers this to be evidence that *kara*-subjects may occur vP-internally at the point of Spell-Out.

3. Scrambling Effects and Two Hypotheses

Although Japanese is a head-final language with a canonical SOV order, scrambling operations provide the language with a flexible word order. In canonical sentences, the subject is followed by an object, with the head verb appearing at the end. Those with other word orders (e.g., OSV) are considered to be scrambled. In several psycholinguistic studies, native Japanese speakers took longer to process sentences with a scrambled OSV order than those with a canonical SOV order. This is known as the scrambling effect (e.g., Tamaoka et al. 2005). Furthermore, Tamaoka et al. (2005) used five different types of Japanese sentences, including passive sentences, potential sentences, and causative sentences, to investigate the priority information for canonical phrase order. They arrived at the conclusion that neither case particles nor thematic roles, but grammatical functions provide fully satisfactory information for canonical order. What is interesting in this study is that even when subjects were marked by *-ni*, native speakers still understood them as subjects of sentences and scrambling effects were observed. This provides a crucial clue concerning constructions with NP-*kara*.

In an active sentence with a transitive verb, the *ga*-marked subject is generated in Spec-vP as an external argument and then moves to Spec-TP, while the object is generated as the complement of the head verb (e.g., Fukui 1986, Kitagawa 1986, Kuroda 1988). The structure of (1a) ‘The principal handed over the

certificate' can be described as in (6a). Scrambled OSV orders are considered to be derived from the canonical order by moving a constituent from its canonical position to a derived position (e.g., a position in the left periphery). In the case of (6b), the OSV order can be generated by moving the object *syoomeisyo-o* 'certificate-ACC' from its canonical position inside the VP to its derived position in TP. As a result, the scrambled structure in (6b) contains more TP layers than the canonical structure in (6a).

- (6) a. [TP Kootyoo-ga_i [T_i [vP t_i [v_i [VP syoomeisyo-o watasi-]]] ta]].
 b. [TP Syoomeisyo-o_j [TP kootyoo-ga_i [T_i[vP (t_j) t_i [v_i [VP t_j watasi-]]] ta]]].

Gap-filling parsing (e.g., Frazier and Clifton 1989 for English; Sakamoto 2001, Tamaoka et al. 2005, 2013 for Japanese) has been used to explain scrambling effects between sentences with canonical and scrambled word orders. When native speakers encounter a scrambled sentence, they construct a filler-gap dependency, establishing a relationship between a constituent's canonical position and its derived position. For instance, when an object such as *syoomeisyo-o* 'certificate-ACC' appears sentence-initially in a Japanese sentence, native Japanese speakers are likely to initially treat the sentence as one without a subject (i.e., an instance of subject dropping), such as *syoomeisyo-o watasi-ta* '(Someone) handed over the certificate.' Native Japanese speakers then predict that a head verb will follow the object. However, when they see a subject such as *kootyoo-ga* 'the principal' after the object, they recognize that the object in the sentence-initial position is a filler and that there is a gap before the head verb. Based on the canonical word order of Japanese, they understand that the object has been moved from this gap site, and they build a relationship between the filler and the gap. Moreover, using eye-tracking movement studies, Tamaoka et al. (2013) observed an extra load at the third phrase (*ga*-marked subject) in sentences with double-scrambled O₁O₂SV order (*Tom-ni hon-o Mary-ga kaesi-ta* 'Mary returned the book to Tom') compared to those with the canonical order (*Mary-ga Tom-ni hon-o kaesi-ta*). This indicates the possibility that native speakers may use the subject information to predict the construction of the whole sentence according to canonical order before seeing the head verb. Although Tamaoka et al. (2013) suggest a heavy re-reading to the object NP after seeing the sentence-final verb, they also indicate that the subject in the scrambled order triggers gap-filling parsing prior to the verb.

According to the processing mechanisms of canonical order and scrambled order, we test two hypotheses in this study. The first is called the subject hypothesis. It assumes that native Japanese speakers regard NP-*kara* as a subject. As mentioned above, when the two conditions are satisfied, *-ga* can be replaced with *-kara*. Theoretically, a *kara*-marked subject is a vP-internal subject that can trigger subject honorification and can be the antecedent of a reflexive pronoun, just like a *ga*-marked subject. Therefore, we might suppose that the sentences in which subjects are marked with *-kara* in canonical SOV order such as (7a) and scrambled OSV order such as (7b) have the following structures.

- (7) a. [_{TP} [_{T'} [_{VP} Kootyoo-*kara* [_{v'} [_{VP} syoomeisyo-*o* watasi-]]]] ta]].
 b. [_{TP} [_{T'} [_{VP} Syoomeisyo-*o*_i [_{VP} kootyoo-*kara* [_{v'} [_{VP} *t*_i watasi-]]]]]] ta]].

Work on scrambling effects can provide insight into the structure of sentences with *kara*-marked NPs. Because the object *syoomeisyo-o* ‘certificate-ACC’ has moved from its canonical position inside VP to the outer Spec of vP, when native speakers see the object first, they initially believe that (7b) is a sentence without an overt subject. However, they will then see *kootyoo-kara* ‘the principal.’ If a native speaker regards NP-*kara* as a subject like NP-*ga*, gap-filling parsing will be triggered to construct a fill-gap dependency. As a result, the scrambling effect is predicted between canonical SOV and scrambled OSV orders.

On the other hand, we still cannot completely ignore the possibility that native speakers simply process an NP-*kara* as a VP-adjunct standing for the “source,” in which case the issues of subject honorification and the anaphoric interpretation should be given an alternative account. Thus, the second hypothesis is the VP-adjunct hypothesis. It assumes that native Japanese speakers regard NP-*kara* as a VP-adjunct. We might then suppose that the sentences with an NP-*kara* as a VP-adjunct have the structures schematically shown in (8).

- (8) a. [_{TP} [_{T'} [_{VP} Kootyoo-*kara* syoomeisyo-*o* watasi-]] ta]].
 b. [_{TP} [_{T'} [_{VP} Syoomeisyo-*o* kootyoo-*kara* watasi-]] ta]].

Koizumi and Tamaoka (2006) conducted a psycholinguistic experiment to investigate the canonical positions of three types of adverbs (CP-adverbs, TP-adverbs, and VP-adverbs) with different word orders. They reported null effects of scrambling between VP-adverbs that precede objects (*SAdvOV* order) and VP-adverbs that follow objects (*SOAdvV* order). Thus, Koizumi and Tamaoka (2006) claim that the positions both before and after the object are canonical positions for VP-adverbs. Since VP-adjuncts have two canonical positions, both *NP-karaOV* and *ONP-karaV* are considered canonical orders if NP-*kara* is a VP-adjunct. Null effects of scrambling should then be observed between the two orders.

4. Experiment

4.1. Participants

Thirty native Japanese speakers who were either undergraduate or graduate students at Nagoya University in Japan participated in the present experiment. Two participants were removed from the analysis due to issues with the response box. This left a total of 28 participants (15 females and 13 males). Their ages ranged from 17 years and 11 months to 27 years and 11 months, with a mean age of 19 years and 3 months and a standard deviation of 23 months on the day of testing.

4.2. Materials

To directly compare sentences with *-ga* and *-kara* marked NPs, two types of markers (*-ga* and *-kara*) and two types of orders (SOV and OSV) were used for the

present experiment. Active sentences with two arguments (i.e., transitive verbs) or three arguments (i.e., ditransitive verbs) were used. In the case of ditransitive verbs, noun phrases with dative case markers were omitted. For *ga*-marked NPs, the following types of sentences were created: (i) canonically ordered sentences with S-*ga*OV and (ii) their scrambled ordered counterparts with OS-*ga*V. For the *kara*-marked NPs, the following types of sentences were created: (iii) S-*kara*OV sentences and (iv) OS-*kara*V sentences. Verbs were kept the same throughout (i)–(iv). Noun phrases in (i)–(iv) were also kept the same and only altered to create the scrambled order (i.e., minimal pairs were created). This ensured that the difficulty level of each sentence and individual word frequency would not influence the processing of any of the conditions.

A total of 32 canonical sentences with *ga*-marked subjects were created (e.g., *Kootyoo-ga syoomeisyoo-o watasi-ta* ‘The principal handed over the certificate’). Based on these 32 sentences, we created 32 corresponding scrambled sentences with *ga*-marked subjects (e.g., *Syoomeisyoo-o kootyoo-ga watasi-ta*). We also created 32 canonical *kara*-marked subject sentences, minimal pairs with the *ga*-marked sentences (e.g., *Kootyoo-kara syoomeisyoo-o watasi-ta*). Finally, we created 32 corresponding scrambled sentences (e.g., *Syoomeisyoo-o kootyoo-kara watasi-ta*). In total, 64 canonical and 64 scrambled sentences were created. Given that this was a sentence correctness decision task, we called this group of 128 sentences the correct sentences, as they were semantically plausible (“correct”). To avoid presenting the same sentence to the same participant more than once, the four conditions created by 32 original sentences (32 original sentences × 4 conditions = 128 sentences) were distributed among four lists containing eight sentences from each category (i)–(iv) (8 sentences × 4 conditions × 4 lists = 128 sentences), and were then assigned to four groups of participants following a Latin square design. Each of the four lists consisted of eight canonical and eight scrambled sentences with *ga*-marked NPs, as well as eight canonical and eight scrambled sentences with *kara*-marked NPs.

We also created a corresponding class of incorrect sentences, including 32 semantically incorrect sentences with canonical word order (e.g., *Syooboodan-ga kasai-o settoku-sita* ‘Fire brigades convinced the fire’) and 32 semantically incorrect sentences with scrambled word order. In addition, as dummy sentences, we also included 20 commonly used correct sentences (e.g., *Nihon-no momizi-wa yuumei-da* ‘Japanese maple trees are famous’) and 20 incorrect sentences (e.g., *Iriguti-de kimono-ga odotteiru* ‘A kimono is dancing at the entrance’). Following a Latin square design, 32 incorrect sentences and 40 dummy sentences were added to each of the four lists. As a result, each participant saw one of four lists consisting of 104 sentences, namely, 32 correct sentences (YES responses), 32 incorrect sentences (NO responses), and 40 dummy sentences (20 YES and 20 NO responses). All target stimuli are available as a PDF file at the website of <http://tamaoka.org/scholarly/index.html> under the title of this article (#171).

4.3. Procedure

The experiment employed a whole-sentence correctness decision task showing one sentence at a time on a computer screen. Stimuli with both YES and NO correct responses were presented to participants in random order in the center of a computer screen 600 milliseconds after the appearance of plus marks ('+++++') indicating an eye fixation point. Participants were instructed to make a sentence correctness decision as quickly and as accurately as possible, deciding whether or not the sentences made sense. Responses were registered by pressing a YES or NO button. 20 practice trials were given to the participants prior to the commencement of the actual testing.

5. Analysis and Results

Reaction times outside of 2.5 standard deviations at both the high and low range for each participant were trimmed. Only the stimulus sentences that evoked correct responses were used in the analyses of reaction time. The mean reaction time and accuracy rates for correct sentences are presented in Table 1.

Table 1. Reaction times and accuracies for canonical (SOV) and scrambled (OSV) sentences with *ga*- and *kara*-marked subjects (S)

Subject marker	Word order	Reaction time (ms)		Accuracy (%)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
- <i>ga</i>	SOV	1,353	385	98.2	13.3
	OSV	1,495	424	93.1	25.3
- <i>kara</i>	SOV	1,542	476	88.0	32.5
	OSV	1,557	441	89.3	31.0

Note: *M* = mean. *SD* = standard deviation.

5.1. Reaction time

For correct sentences (YES responses), a linear mixed-effects model (LME model; see Baayen, 2008) was used, with stimulus items and participants as random effects (random intercepts and slopes), and subject marker (-*ga* or -*kara*) and word order (canonical or scrambled) as fixed effects. LME analysis was conducted using R Studio (version 0.98.1091). The *lmer* function in the *lme4* package was used to model reaction time data. While the models were analyzed with full variance and co-variance for the main effects and random effects, the models were chosen on the basis of the first model successfully output. The reaction time model was "model <- lmer (reaction time ~ subject marker * word order + (1 + subject marker * word order | subject) + (1 + subject marker * word order | item), data)." The results based on this model are presented in Table 2.

Table 2. LME results of reaction times on correct canonical (SOV) and scrambled (OSV) sentences with *ga*- and *kara*-marked subjects

	Estimate	SE	<i>t</i> value	<i>p</i> value (> <i>t</i>)	
(Intercept)	846	111	7.64	0.000	***
Subject marker: - <i>ga</i> or - <i>kara</i>	373	78	4.76	0.000	***
Word order: canonical or scrambled	290	71	4.09	0.000	***
Subject marker × word order	-153	47	-3.25	0.002	**

Note: *SE* = standard error. *df* = degree of freedom. ** $p < .01$. *** $p < .001$.

The probability was determined by a *t*-distribution with function *lmer*. The LME results of the experiment revealed that both main effects of subject marker [$t(800) = 4.76, p < .001$] and word order [$t(800) = 4.09, p < .001$] were significant for reaction time. Thus, *ga*-marked sentences were processed faster than corresponding *kara*-marked sentences, while the sentences with canonical word order were also processed faster than their corresponding sentences with scrambled word order. The interaction between subject marker and word order was also significant [$t(800) = -3.25, p < .01$], suggesting different patterns depending upon the combination of the two variables. Reaction times for canonical *ga*-marked sentences ($M = 1,353$ ms) were significantly faster than their corresponding scrambled *ga*-marked sentences ($M = 1,495$ ms). On the other hand, no scrambling effect was observed between canonical ($M = 1,542$ ms) and scrambled *kara*-marked sentences ($M = 1,557$ ms). This contrasting result regarding the scrambling effect between the *ga*-marked and *kara*-marked sentences supports the VP-adjunct hypothesis but not the *kara*-marked subject hypothesis.

5.2. Accuracy

For accuracy, correct responses (accuracy) were recorded as 1 and incorrect responses as 0; thus, the binomial option in the R *glmer* package was used. For this analysis, the same procedure was used as for reaction times, resulting in the following model: “model <- glmer (accuracy ~ subject marker * word order + (1 + word order | subject) + (1|item), data, family = binomial).” The results are presented in Table 3. The probability was determined by the *z* distribution with function *glmer*. The experiment also revealed that both fixed effects subject marker [$z(867) = -3.11, p < .01$] and word order [$z(867) = -2.41, p < .05$] were significant for accuracy. Their interaction was also significant [$z(867) = 2.37, p < .05$].

Table 3. LME results of accuracies on canonical (SOV) and scrambled (OSV) sentences with *ga*- and *kara*-marked subjects

	Estimate	SE	z value	p value (> z)	
(Intercept)	9.21	2.19	4.20	0.000	***
Subject marker: <i>-ga</i> or <i>-kara</i>	-3.63	1.17	-3.11	0.002	**
Word order: canonical or scrambled	-2.92	1.21	-2.41	0.016	*
Subject marker × word order	1.56	0.66	2.37	0.018	*

Note: SE = standard error.

As shown in Table 1, canonical *ga*-marked sentences ($M = 98.2\%$) were processed more accurately than their corresponding scrambled *ga*-marked sentences ($M = 93.1\%$). Similar to what was seen in the reaction time results, no difference in accuracy was observed between canonical ($M = 88.0\%$) and scrambled *kara*-marked sentences ($M = 89.3\%$). Here, accuracy and reaction data showed parallel patterns.

6. Discussion

In order to investigate whether the so-called *kara*-subject is syntactically a subject [(7)] or an adjunct [(8)], the present study conducted an experiment comparing the processing time of sentences with NP-*ga* and NP-*kara* in two different orders. The results showed that canonical sentences with *ga*-marked subjects had shorter reaction times and higher accuracy rates than the corresponding scrambled sentences. This result is consistent with the standard view that native Japanese speakers regard the nominative *-ga* as a subject marker, and thus, interpret NP-*ga* as a subject. This involves applying gap-filling parsing to process scrambled sentences (e.g., Frazier and Clifton 1989 for English; Sakamoto 2001, Tamaoka et al. 2005, 2013 for Japanese). In contrast, no scrambling effect was observed between the two orders when what appears to be the subject is marked with *-kara*. A similar result was obtained by Koizumi and Tamaoka (2006) regarding VP-adverbs, indicating that both the positions before the object (SAdvOV) and after the object (SOAdvV) can be canonical positions for VP-adverbs. When applied to the present study, the result can be understood to show that native Japanese speakers process *kara*-marked NPs as VP-adverbs, having both [NP-*kara* O V] and [O NP-*kara* V] as canonical orders. Thus, the present study supports the hypothesis that a *kara*-marked NP is a VP-adjunct.

A question then naturally arises as to why *kara*-marked NPs corresponding to *ga*-marked subjects exhibit a dual nature: they are subjects in the sense that they can trigger subject honorification and can be the antecedent of *zibun*; at the same time, they are adjuncts in that they do not show scrambling effects with respect to the accusative object. Although it is beyond the scope of this paper to present a full-fledged analysis, we discuss two possible avenues toward such an examination.

One possibility is concerned with the rarity of *kara*-subject sentences. Since *kara*-phrases are used more often as non-subjects, they tend to be processed as adjuncts (after all, even though an NP-*kara* has an agent thematic role, it can still

be processed as the “source” of an action, which conveys something to someone). Therefore, it is possible that *kara*-marked NPs in our experimental materials are initially processed as adjuncts, and only after encountering the verb are they reanalyzed as subjects. *Kara*-marked NPs do not show scrambling effects because they are processed as adjuncts at least initially, and they do exhibit subjecthood because they are ultimately analyzed as subjects. Although this is certainly a possibility, it does not seem to be probable for the following reasons. If an NP-*kara* is initially processed as an adjunct and is later reanalyzed as a subject in sentences with the [NP-*kara* O V] order, the NP-*kara* – but not the object – is affected by the reanalysis processes after encountering the verb, as schematically shown in (9a). In contrast, in sentences with the [O NP-*kara* V] order, both the NP-*kara* and the object are pulled out of the VP in the reanalysis, as shown in (9b).

- (9) a. ... [_{VP} NP-*kara* object + V → ... [_{VP} NP-*kara* [_{VP} object V]]
 b. ... [_{VP} object NP-*kara* + V → ...object_i [_{VP} NP-*kara* [_{VP} t_i V]]

Thus, the cost of reanalysis should be higher in (9b) than in (9a). In addition, the resultant structure is much more complex in (9b) than (9a). For these reasons, the [O NP-*kara* V] order should be harder to process than the [NP-*kara* O V] order even in this scenario, contrary to the fact.

To further pursue this line of reasoning, sentence processing experiments probing the time course of processing load (e.g., with eye-tracking) may be necessary. According to pre-head incremental processing (e.g., Kamide and Mitchell 1999), an extra load should be observed with NP-*kara* since native speakers need the subject to predict the construction before seeing the verb. Furthermore, it is conceivable that native speakers will re-read the sentences once the head verb has become known (i.e., post-head processing), as the syntax and semantics will be matched with the head verb (e.g., Tamaoka et al. 2013). In the case of *kara*-marked subjects, the information of the head verb is necessary to judge whether NP-*kara* is a subject. Therefore, it is reasonable to assume that an extra load and high frequency of regression-out gaze movements at the phrase of the head verb and regression-in gaze movements at the phrase of NP-*kara* would be observed using eye tracking.

The second possibility we will consider involves the null subject. If NP-*kara* is indeed an adjunct rather than a subject, as suggested by the experimental results reported here, and yet sentences such as (2b) and (3b) show that they must contain a subject, we are led to conclude that the subject is phonetically empty. We would therefore like to suggest that the type of sentence in question involves a phonetically empty subject in Spec-VP that is associated with an NP-*kara*. The silent subject functions as a trigger of subject honorification and the antecedent of a reflexive pronoun, yielding the illusion that the *kara*-NP is a subject.

A piece of supporting evidence for this null subject hypothesis comes from variable binding. Ueda (2003) observes that the bound variable interpretation with overt personal pronouns is impossible with the *ga*-subject, but it is possible with the *kara*-subject, as shown in (10).

- (10) a. *Daremo_i ga [karera_i ga Taro o sikaru to]
 everyone NOM they NOM Taro ACC scold that
 it-ta.
 say-PAST
 ‘*Everyone_i said that they_i will scold Taro.’
- b. Daremo_i ga [karera_i kara Taro o sikaru to]
 everyone NOM they ABL Taro ACC scold that
 it-ta.
 say-PAST
 ‘Everyone_i said that they_i will scold Taro.’

In these examples, the overt pronoun *karera* ‘they’ in the embedded clause is intended to be bound by the matrix quantified subject *daremo* ‘everyone’. The ungrammaticality of (10a) is as expected, given the well-known fact that being referential, overt pronouns in Japanese cannot be bound variables (Hoji 1991). What is surprising is the acceptable status of (10b), which should be ungrammatical for the same reason as (10a). Why should (10b) be grammatical despite that the overt pronoun is bound by the quantifier phrase? This conundrum can be readily resolved under the null subject hypothesis as follows: The embedded clause in (10b) involves a null pronoun as a part of the null subject, and it is this null pronoun, rather than the overt pronoun, that is bound by *daremo*.

The category of the null subject seems to be PP rather than NP, because it cannot host a floating numeral quantifier (NQ). In Japanese, a floating NQ must be locally associated with a noun phrase (Miyagawa 1989). Thus, an NP with a case marker can host an adjacent floating NQ. In contrast, an NP with a postposition cannot host a floating NP, because the NP and the NQ are not in a local relation due to the intervening PP node. This is exemplified in (11).

- (11) a. Sensei ga 3-nin syorui o watasi-ta.
 teacher NOM 3-CL documents ACC hand.over-PAST
 ‘Three teachers handed over documents.’
- b. *John ga [_{PP} [_{NP} sensei] kara] 3-nin purezento o
 John NOM teacher ABL 3-CL present ACC
 morat-ta.
 receive-PAST
 ‘John received presents from three teachers.’

Now, consider the *kara*-subject sentence in (12). The NQ *3-nin* ‘3-CL’ in this sentence cannot be associated with the NP *sensei* ‘teacher’ in the PP headed by *-kara* for the same reason as in (11b). However, the NQ should be able to be associated with the null subject in Spec-vP if the null subject is an NP. The unacceptability of (12) therefore suggests that the null subject in a *kara*-subject sentence is not an NP. If it is not an NP, the most plausible candidate is a PP because it is associated with an NP-*kara*, which is a PP.

- (12) *Sensei kara 3-nin syorui o watasi-ta.
 teacher ABL 3-CL documents ACC hand.over-PAST
 ‘Three teachers handed over documents.’

7. Conclusion

Although some *kara*-marked NPs have been regarded as subjects in several theoretical studies (e.g., Cho 1995, Inoue 2002, Ito 2001, Kishimoto 2012), the results of the psycholinguistic experiment reported here indicate that these *kara*-marked NPs are in fact VP-adjuncts. We tentatively suggest that *kara*-phrases of this kind appear to be subjects because they are associated with a phonetically empty subject in Spec-vP.

References

- Baayen, R. Harald (2008) *Analyzing linguistic data: A practical introduction to statistics*. Cambridge: Cambridge University Press.
- Cho, Lin-Sei (1995) *Ga to kara* [*Ga* and *kara*]. In: Tatsuo Miyajima and Yoshio Nitta (eds.) *Nihongo ruigihyogen-no bunpoo (joo)* [*The grammar of synonyms in Japanese, Vol. 1*], 43–52. Tokyo: Kurosio.
- Frazier, Lyn and Charles Jr. Clifton (1989) Identifying gaps in English sentences. *Language and Cognitive Processes* 4: 93–126.
- Fukui, Naoki (1986) A theory of category projection and its applications. Unpublished doctoral dissertation, MIT.
- Harley, Heidi (2008) On the causative construction. In: Susumu Miyagawa and Mamoru Saito (eds.) *The handbook of Japanese linguistics*, 20–53. Oxford: Oxford University Press.
- Hoji, Hajime (1991) Raising-to-object, ECM and the major object in Japanese. A handout presented at Japanese Syntax Workshop at University of Rochester.
- Inoue, Kazuko (2002) Noodoobun, judoobun, nijuumokutekigo koobun-to *kara-kaku* [Active sentences, passive sentences, sentences with ditransitive verb, and case *kara*]. *Scientific Approaches to Language (Kanda University of International Studies)* 1: 49–76.
- Ito, Taketo (2001) Shugo meishiku-ni okeru *ga* to *kara*-no kootai-ni tsuite [The *ga-kara* alternation of the noun phrases of subjects]. *Meikai Japanese Language Journal* 6: 45–63.
- Kamide, Yuki and Don C. Mitchell (1999) Incremental pre-head attachment in Japanese parsing. *Language and Cognitive Processes* 14(5–6): 631–662.
- Kishimoto, Hideki (2012) Subject honorification and the position of subjects in Japanese. *Journal of East Asian Linguistics* 21: 1–41.
- Kitagawa, Yoshihisa (1986) Subjects in Japanese and English. Unpublished doctoral dissertation, University of Massachusetts.
- Koizumi, Masatoshi (1991) Syntax of adjuncts and the phrase structure of Japanese. Unpublished master’s thesis, Ohio State University.
- Koizumi, Masatoshi and Katsuo Tamaoka (2006) Bunkaiseki-ni yoru Nihongo-fukushirui-no kihongojun-no hantei [A study of the canonical positions of four types of verbs in Japanese by a sentence parsing experiment]. *Ninchi Kagaku [Cognitive Studies]* 13(3): 392–403.
- Kuroda, S.-Y. (1988) Whether we agree or not. *Linguisticae Investigationes* 12(1): 1–47.
- Miyagawa, Shigeru (1989) *Structure and case marking in Japanese*. New York: Academic Press.
- Sakamoto, Tsutomu (2001) Bun-no rikai: Kakimaze bun [Understanding of sentences:

- Scrambling]. *Gengo [Language]* 30(10): 106–111.
- Tamaoka, Katsuo, Hiromu Sakai, Junichiro Kawahara, Yayoi Miyaoka, Hyunjung Lim, and Masatoshi Koizumi (2005) Priority information used for the processing of Japanese sentences: Thematic roles, case particles or grammatical functions? *Journal of Psycholinguistic Research* 34(3): 281–332.
- Tamaoka, Katsuo, Michiko Asano, Yayoi Miyaoka, and Kazuhiko Yokosawa (2013) Pre- and post-head processing for single- and double-scrambled sentences of a head-final language as measured by the eye tracking method. *Journal of Psycholinguistic Research* 43(2): 167–185.
- Ueda, Yukiko (2003) Subject positions and derivational scope calculation in minimalist syntax: A phase-based approach. *Scientific Approach to Language (Kanda University of International Studies)* 2: 189–215.

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【要 旨】

主語とVP付加詞を区別する

——心理言語学からみるカラ格名詞句——

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多くの先行研究ではカラ格名詞句を主語として扱うことができると指摘している（張 1995, 井上 2002, 伊藤 2001, Kishimoto 2012 など）。カラ格名詞句は尊敬語化を引き起こしたり、「自分」の先行詞となったりする場合がある。Ueda (2003) や Kishimoto (2012) などではカラ格名詞句は TP の指定部に移動せず, vP の指定部に留まる可能性に言及している。一方, 後置詞であるカラ格は動詞の付加詞としての理解も考えられる。この2つの可能性を検討するために, 本研究ではカラ格主語文とガ格主語文の文処理実験を行った。その結果, 異なる語順のガ格主語文にはかき混ぜ効果が観察されたが, 異なる語順のカラ格主語文にはかき混ぜ効果が観察されなかった。小泉・玉岡 (2006) では, VP 副詞には2つの正順語順 (目的語の前と後) があると指摘している。この指摘を踏まえて考えると, 日本語母語話者はカラ格名詞句を VP 付加詞として理解する可能性があり, 結果としてカラ格名詞句も目的語の前または目的語の後に生成されることが示唆される。