HIDEHARU TANAKA

JAPANESE FOCUS PARTICLES AND CROSSCATEGORIAL SEMANTICS: A PRELIMINARY NOTE*

1 Issue

Japanese focus particles, such as *mo* 'also', *wa* 'at least', and *sae* 'even', is capable of crosscategorial modification. This means that they can uniformly modify a wide variety of syntactic categories, as is the case with their counterparts in English (e.g., Kuroda 1965, Rooth 1985). For example, focus particles can be combined with the four major categories, namely NP, PP, AP, and VP, as shown by the following paradigm.

(1) a. *Kare-wa* [NP *sono-hon*]-***mo/wa/sae*** *yon-da*.
he-Top the-book-also/at.least/even read-Past
'He also/at least/even read the book.'

b. *Kare-wa* [PP *Mary-to*]-***mo/wa/sae*** *ason-da*.
he-Top Mary-with-also/at.least/even play-Past
'He also/at least/even played with Mary.'

c. *Kare-wa* [AP *akippoku*]-***mo/wa/sae*** *at-ta*.
he-Top flighty-also/at.least/even be-Past
'He was also/at least/even flighty.'

d. *Kare-wa* [VP *odoroki*]-***mo/wa/sae*** *si-ta*.
he-Top get.surprised-also/at.least/even do-Past
'He also/at least/even got surprised.'

In this paper, we address this crosscategorial modification capacity, limiting our discussion to the additive particle *mo*. The general question is why a single focus particle can uniformly modify different categories. This could be a challenging issue for any compositional approach to the semantics of focus particles, because the semantic types of different categories are not uniform. In general, we need to posit at least four

* Professor Masaharu Kato has done lots of things for me. Among others, he agreed to be a member of my dissertation committee at Osaka University, and when I proposed a new idea on my research, he always challenged it by asking bigger questions than I expected. Any of these memories is a good one, and I would like to express my gratitude to Kato-sensei, wishing him the best of luck in his new life. This work was supported by JSPS Grant-in-Aid for Early-Career Scientists, Grant Number JP18K12368.

semantic types: type **e** (*individual*), type **<e, t>** (*predicate*), type **<<e, t>, t>** (*quantifier*), and type **<<e, t>, <e, t>>** (*modifier*).[1] Importantly, one syntactic category may have more than one semantic type (e.g., Partee 1987). For example, NP may denote an individual, predicate, or quantifier; PP and AP may denote a predicate or modifier; and VP may denote a predicate, and possibly nothing else, as shown below.

(2) a. i. *category*: **NP**
ii. *semantic types*: **e** / **<e, t>** / **<<e, t>, t>**

b. i. *category*: **PP**
ii. *semantic types*: **<e, t>** / **<<e, t>, <e, t>>**

c. i. *category*: **AP**
ii. *semantic types*: **<e, t>** / **<<e, t>, <e, t>>**

d. i. *category*: **VP**
ii. *semantic types*: **<e, t>**

Of course, which semantic type a category selects relies on what syntactic position it occupies. Thus, in (1a-d), the NP must be an individual or quantifier; the PP must be a modifier; and the AP and VP must be predicates. It is then clear that *mo* can uniformly modify different semantic types of expressions. Given this, any semantic analysis of *mo* must explain its capacity of crosscategorial modification.

In fact, most previous analyses of *mo* fail to address the problem of crosscategorial modification, since their interests center on the case of NP modification. To make the point, let us consider Kuroda's (1969) analysis of *mo*, which has been a standard one in the literature. Under this analysis, the meaning of *mo* is determined as shown in (3), where we introduce the symbol • to show that what follows it is part of the speaker's requirement, i.e., what the speaker requires the hearer to infer as true.[2]

(3) $[\![mo]\!] = \lambda x.\lambda P.\ [P(x) \bullet \exists y.\ [y \neq x \wedge P(y)]]$

Given that x, y are variables of type **e**, and P is a variable of type **<e, t>**, what is on the left of • is the at-issue content of *mo*; once *mo* combines with an individual x and a predicate P, it makes the assertion that P holds for x. On the other hand, what is on the right of • is the non-at-issue content of *mo*; this part forces the hearer to infer that there is a different individual y for which P holds. The point is that this standard analysis requires the sister of *mo* to be an element of type **e**. It can thus be applied to (4).

---

[1] See Heim and Kratzer (1998) for general discussion on semantic types. Note also that Rubin (1996) argues that AP and PP act as a modifier when they are combined with a modifier head, whose phonological realization varies from language to language.

[2] This requirement by *mo* has been called a presupposition, but Szabolcsi (2015) argues against the treatment of *mo* as a presupposition trigger; her proposal is to define *mo* as a postsupposition trigger, which is a new notion. For a quick review of Szabolcsi's approach, see Tanaka (to appear).

(4) [$_{NP}$ *John*]-***mo*** [$_{VP}$ *hasit*]-*ta.*
John-also run-Past
'John also ran.'

Here, no compositional problem arises, as *mo*' sister is the NP *John*, which may denote a type **e** element, namely the individual **j**. Specifically, *mo* determines the value of x as **j** by combining with *John*, and then specifies the value of P as $\lambda x.\ [\mathbf{run}(x)]$ by combining the unit *John-mo* with the VP *run*, so the meaning of (4) is represented as $\mathbf{run}(\mathbf{j}) \bullet \exists y.\ [y \neq \mathbf{j} \wedge \mathbf{run}(y)]$. However, the same result does not obtain, if the sister of *mo* is not NP. For example, the standard analysis of *mo* cannot be applied to (5).

(5) [$_{NP}$ *John*]-*ga* [$_{VP}$ *hasiri*]-***mo*** *si-ta.*
John-Nom run-also do-Past
'John also ran.'

The problem is that the sister of *mo* is the VP *run*, which denotes an element of type **<e, t>**, namely the predicate $\lambda x.\ [\mathbf{run}(x)]$. Put differently, the standard analysis cannot allow *mo* to combine with the VP, due to a type mismatch. In this way, most previous analyses of *mo* put aside its crosscategorial modification ability, and can only be applied to the case of NP modification (e.g., Shudo 2002, Shimoyama 2006, Yatsushiro 2009, Kobuchi-Philip 2009, Mitrović and Sauerland 2016).

The goal of this paper is to sketch an approach to the problem of crosscategorial modification, focusing on the additive particle *mo*. The discussion proceeds as follows. Section 2 reviews two previous approaches, namely Kuroda's (1965) *single-meaning + movement approach*, and Rooth's (1985) *meaning-derivation + non-movement approach*. We examine their key ideas and point out empirical problems with them. Section 3 proposes a sketch of our alternative approach, which we call a *single-meaning + non-movement approach*, and aims to support the following new hypothesis.

(6) The meaning of a focus particle is basically an identity function.

Section 4 concludes by addressing some remaining questions for the future research.

2 Review

In the literature, at least two approaches have been proposed for the issue of crosscategorial modification. The first one is a *single-meaning + movement approach*, which is proposed by Kuroda (1965) and later updated by Aoyagi (1998) and Kotani (2008). Under this approach, a focus particle is assigned just a single meaning, and after getting attached to a category which its meaning can modify, the focus particle undergoes movement to its surface position. For example, Kuroda suggests that the meaning of *mo* allows it to only modify a category whose meaning is of type **t** (*proposition*). Here, let us suppose that TP is such a category. Then, Kuroda's analysis requires that *mo* be base-generated as the sister of a TP, and then undergo downward movement to an NP or VP inside that TP, as shown in (7).

(7)

[[$_{\text{TP}}$ NP-***mo*** [$_{\text{T}'}$ [$_{\text{VP}}$ V] T]] __*t*__]

[[$_{\text{TP}}$ NP [$_{\text{T}'}$ [$_{\text{VP}}$ V] T]] ***mo***]

[[$_{\text{TP}}$ NP [$_{\text{T}'}$ [$_{\text{VP}}$ V]-***mo*** T]] __*t*__]

It is then clear what consequence Kuroda's approach carries; that is, *mo* must always be interpreted in the adjoined position of TP, how matter where it overtly occurs. Under this approach, therefore, examples (4) and (5) could mean virtually the same thing, although Kuroda (1965: 80) mentions the possibility that the movement rule for *mo* makes the meaning of (4) more specific than that of (5).

The second approach is a *meaning-derivation* + *non-movement approach*, which is proposed by Rooth (1985). Although Rooth applies his proposal only to English focus particles, it can be readily extended to the semantics of Japanese focus particles. The leading idea is that the primitive meaning of a focus particle is one that modifies an expression of type **t**, and that type-shifting rules derive from the primitive meaning a variety of other meanings, each of which can modify a different category; see Rooth (1985: 120ff.) for more detail. Thus, if we apply this approach to the semantics of *mo*, we need to define its primitive meaning, say, $[\![mo^{\mathbf{TP}}]\!]$. Suppose that $[\![mo^{\mathbf{TP}}]\!]$ looks like $\lambda\phi.\ [\phi \bullet \exists\phi'.\ [\mathbf{\Pi}(\phi', \phi) \wedge \phi']]$, where ϕ, ϕ' are variables of type **t**, and $\mathbf{\Pi}$ requires ϕ' to be a proposition distinct from the ordinary value of ϕ, but to be a member of the focus value of ϕ. Given this primitive meaning, we then derive a variety of meanings of *mo* as shown in (8), where K is a variable of type **<<e, t>, t>**.

(8)

$$[\![mo^{\mathbf{NP}}]\!] = \lambda K.\lambda P.\ [[\![mo^{\mathbf{TP}}]\!](K(P))]$$

$$[\![mo^{\mathbf{TP}}]\!] = \lambda\phi.\ [\phi \bullet \exists\phi'.\ [\mathbf{\Pi}(\phi', \phi) \wedge \phi']]$$

$$[\![mo^{\mathbf{VP}}]\!] = \lambda P.\lambda x.\ [[\![mo^{\mathbf{TP}}]\!](P(x))]$$

Under Rooth's approach, therefore, *mo* does not undergo movement at all. That is, *mo* is always interpreted where it overtly appears, and this is possible, because *mo* is derivationally assigned a variety of meanings, such as $[\![mo^{\mathbf{TP}}]\!]$, $[\![mo^{\mathbf{NP}}]\!]$, and $[\![mo^{\mathbf{VP}}]\!]$.

Then, the question is whether these previous approaches are really tenable. We argue that they are not. Let us begin with Kuroda's *single-meaning* + *movement approach*. Recall that this approach assumes that the meaning of *mo* is always computed in the adjoined position of TP. It is thus predicted that there is no semantic difference between the case of NP-*mo*, where *mo* modifies NP, and the case of VP-*mo*, where *mo* modifies VP. However, this prediction is challenged by the following contrast.

(9) a. **Kyo-wa* [NP *zen'in*]-***mo*** [VP *hasit*]-*ta*.
today-Top everyone-also run-Past
'Today, everyone also ran.'
b. *Kyo-wa* [NP *zen'in*]-*ga* [VP *hasiri*]-***mo*** *si-ta*.
today-Top everyone-Nom run-also do-Past
'Today, everyone also ran.'

The unacceptability of (9a) shows that, if *mo* modifies a universal quantifier such as *zen'in* 'everyone', it cannot be interpreted, as noted by Tanaka (to appear). The point is that Kuroda fails to predict the contrast between (9a) and (9b), because in both cases, *mo* is supposed to be interpreted in the same position, namely in the adjoined position of TP. Furthermore, since Kuroda does not impose any explicit constraint on the movement rule for *mo*, it is predicted that *mo* can modify any category. Still, this prediction is not correct, either, as shown below; that is, *mo* cannot modify AdvP.

(10) a. **John-wa* [AdvP *hayaku*]-***mo*** *hasit-ta*.
John-Top fast-also run-Past
'John also ran fast.'
b. *John-wa* [VP *hayaku hasiri*]-***mo*** *si-ta*.
John-Top fast run-also do-Past
'John also ran fast.'

Let us then argue against Rooth's *meaning-derivation + non-movement approach*. This approach assumes that the primitive meaning of a focus particle is one that modifies a category of type **t**, namely TP. Thus, the very natural prediction is that *mo* can be attached to TP. However, as the following contrast shows, it is totally impossible.[3]

(11) a. *[TP *John-wa* [PP *gakko-de*] *hasit-ta*]-***mo***.
John-Top school-at run-Past-also
'Also, John ran at school.'
b. [TP *John-wa* [PP *gakko-de*]-***mo*** *hasit-ta*].
John-Top school-at-also run-Past
'John also ran at school.'

Of course, the unacceptability of (11a) could be reduced to an independent restriction on the distribution of *mo*, which may be a morphological one. Yet, it is clearly at odd to define the primitive target of *mo*'s modification as a category that it never modifies. Thus, Rooth's approach could explain the contrasts in (9) and (10) in purely semantic terms, but it needs a stipulation to explain that in (11).

To summarize, the two previous approaches to crosscategorial modification fail to answer some of the following three questions: [1] why *mo* cannot be attached to a universal quantifier; [2] why *mo* cannot be attached to AdvP; and [3] why *mo* cannot

[3] In fact, Rooth notices this problem. See Rooth (1985: 124ff.) for relevant data and discussion.

be attached to TP. Specifically, Kuroda's *single-meaning* + *movement approach* cannot account for [1] and [2], because it assumes that *mo* must be always interpreted in the adjoined position of TP, and it should not matter where *mo* overly occurs. On the other hand, Rooth's *meaning-derivation* + *non-movement approach* cannot account for [3], because it assumes that a category like TP is defined as the primitive target of *mo*'s modification, and *mo* should be able to combine with TP. Given these counter-arguments, it may be concluded that these previous approaches are not tenable.

3 Claim

In this section, we propose a sketch of the third approach to crosscategorial modification. Let us call it a *single-meaning* + *non-movement approach*. As this name implies, the core idea of our approach is that every focus particle is given only a single meaning, as in Kuroda (1965), but none undergoes movement, as in Rooth (1985); every focus particle is interpreted where it overtly appears. Accordingly, it is important to make the meaning of a focus particle flexible enough to allow it to modify a variety of categories. Our proposal is that the meaning of a focus particle is basically an *identity function*, which is a function that gives its input value as its output value. For example, we define the at-issue content of *mo* as follows.

(12) $[\![mo]\!] = \lambda X.\lambda Y.\ [X(Y) \bullet \ldots\ ]$

Suppose that X, Y are variables of any semantic types. Then, what is important here is that X is specified as a function that takes Y as its argument, as indicated by the representation $X(Y)$. In other words, X must be an function element, like a *predicate* (i.e., type **<e, t>**; a function from individuals to propositions), a *quantifier* (i.e., type **<<e, t>, t>**; a function from predicates to propositions), and a *modifier* (i.e., type **<<e, t>, <e, t>>**; a function from predicates to predicates). It therefore follows that *mo* can modify the four major categories NP, PP, AP, and VP, since the semantic type of each is identified with one of the function types above. Note that we assume with Partee (1987) that a proper name NP can also be treated as a quantifier. For example, if the proper name *John* is type-shifted to a quantifier, it denotes the set of every predicate P that holds for the individual $\mathbf{j}$ (i.e. $[\![John]\!] = \lambda P.\ [P(\mathbf{j})]$).

We then define the non-at-issue content of *mo* as follows (cf. Tanaka to appear).

(13) $[\![mo]\!] = \lambda X.\lambda Y.\ [X(Y) \bullet \exists Z.\ [Z \subsetneq X \wedge Z(Y)]]$

This non-at-issue content requires the hearer to infer that there is an alternative Z such that (a) Z *is stronger than* X, and (b) $Z(Y)$ holds. Note that clause (a) means that Z must asymmetrically subsumes X. For example, let Z, X be of the quantifier type. Then, if X is $[\![$*most boys*$]\!]$, Z may be $[\![$*every boy*$]\!]$, but not $[\![$*some boy*$]\!]$, because if every boy ran, it entails that most boys did, but if some boy ran, it does not entail that most boys did.[4] Thus, clause (a) may be referred to as a *stronger alternative requirement*. In a nutshell, this non-at-issue content of *mo* requires the hearer to infer the truth of a stronger alternative proposition that entails the at-issue content of *mo*.

To illustrate how our proposal works, we examine the cases of NP modification and VP medication. First, consider (4), repeated below, where *mo* is attached to NP.

(14) [$_{NP}$ *John*]-***mo*** [$_{VP}$ *hasit*]-*ta.*
John-also run-Past
'John also ran.'

Here, *mo* is combined with the NP *John*, and the unit *John-mo* is combined with the VP *run*, so the meaning of (14) is derived as follows; we ignore the meaning of tense.

(15) $[\![mo]\!]([\![John]\!])([\![run]\!])$
$= [\![John]\!]([\![run]\!]) \bullet \exists Z.\ [Z \subsetneq [\![John]\!] \wedge Z([\![run]\!])]$

In this case, the alternative Z must be stronger than $[\![John]\!]$. Thus, if, say, $[\![Bill]\!]$ contextually stands out in addition to $[\![John]\!]$, Z may be identified with $[\![Bill\ \&\ John]\!]$, because it asymmetrically subsumes $[\![John]\!]$.[5] Given this, suppose Z is $[\![Bill\ \&\ John]\!]$. Then, (15) asserts that $[\![John]\!]([\![run]\!])$, and requires the hearer to infer that $[\![Bill\ \&\ John]\!]([\![run]\!])$. This seems to be a correct way to describe the meaning of (14). Let us then consider (5), repeated below, where *mo* is attached to VP.

(16) [$_{NP}$ *John*]-*ga* [$_{VP}$ *hasiri*]-***mo*** *si-ta*.
John-Nom run-also do-Past
'John also ran.'

This example combines *mo* with the VP *run* first, and then applies the unit *run-mo* to the NP *John*, which is of type **e** here, so the meaning of (16) is derived as follows.

(17) $[\![mo]\!]([\![run]\!])([\![John]\!])$
$= [\![run]\!]([\![John]\!]) \bullet \exists Z.\ [Z \subsetneq [\![run]\!] \wedge Z([\![John]\!])]$

The alternative Z here must be stronger than $[\![run]\!]$. For example, suppose John swam before he ran. Then, we may regard the meaning $[\![swim]\!]$ as contextually salient, and may identify Z with $[\![swim\ \&\ run]\!]$, which asymmetrically subsumes $[\![run]\!]$. Given this,

---

[4] Formally, the relation $\subsetneq$ is a set-theoretical one, *proper-subset-of*, but it can be couched functionally as follows. Let Z, X be elements of the same semantic type, then $Z \subsetneq X$ iff $Z \neq X \wedge \forall Y.\ [Z(Y) \rightarrow X(Y)]$. This says that Z is stronger than X iff Z and X are different, and for any Y, if $Z(Y)$ holds, then $X(Y)$ holds.

[5] We assume that the coordinator *&* denotes a function that applies two functions F, G to one and the same argument H. More formally, $[\![\&]\!] = \lambda F.\lambda G.\lambda H.\ [G(H) \wedge F(H)]$. Thus, if *&* is combined with *John*, and then with *Bill*, they jointly denote $[\![Bill\ \&\ John]\!]$, which is equal to $\lambda H.\ [[\![Bill]\!](H) \wedge [\![John]\!](H)]$.

let *Z* refer to ⟦*swim & run*⟧. Then, (16) asserts that ⟦*run*⟧(⟦*John*⟧), and requires the hearer to infer that ⟦*swim & run*⟧(⟦*John*⟧). This also seems to be a right result.

At this point, note that our proposal can deal with one of the three problems with the previous approaches: that is, [1] why *mo* cannot be attached to a universal quantifier UQ. In fact, our proposal can make a more far-reaching prediction. The prediction is that *mo* cannot combine with a bare UQ (e.g., *everyone*), but it can combine with a partitive UQ (e.g., *everyone else*). This prediction is born out, as shown below.

(18) a. **Kyo-wa* [$_{\text{NP}}$ *zen'in*]-***mo*** *hasit-ta*.
toady-To everyone-also run-Past
'Today, everyone also ran.'

b. *Kyo-wa* [$_{\text{NP}}$ *nokori-no-zen'in*]-***mo*** *hasit-ta*.
today-Top rest-Gen-everyone-also run-Past
'Today, everyone else also ran.'

This contrast follows from the stronger alternative requirement. In (18a), the meaning of *mo* requires the existence of an alternative *Z* such that *Z* is stronger than ⟦*everyone*⟧, but it is logically impossible to obtain a stronger quantifier than a UQ, whose quantificational force is the strongest. In (18b), on the other hand, the stronger alternative requirement is satisfied, because a partitive UQ like *everyone else* has a stronger alternative *Z*, which is its bare counterpart *everyone*; that is, if everyone ran, then it entails that everyone else ran.

Let us then consider the other problems, namely [2] why *mo* cannot be attached to AdvP, and [3] why *mo* cannot be attached to TP. Unfortunately, we are not in a position to deal with these two problems; our proposal, as it is, does not provide any account of them. However, this does not mean that our proposal is untenable, because it is not falsified in a strict sense; it simply does not make any predictions on the two problems. As for the two previous approaches, it may be concluded that they are not tenable, since their predictions are falsified. For instance, Kuroda's (1965) approach assumes that *mo* is always interpreted in the adjoined position of TP, so that it would follow that *mo* can also be attached to AdvP, but this is not the case. Rooth's (1985) approach assumes that a category like TP is defined as the primitive target of *mo*'s modification, so that it would follow that *mo* can also be attached to TP, but this is not the case. Thus, although we cannot say that our approach is a correct one, we can say that its predictions are not falsified, and in this sense, it is worth developing.

4 Conclusion

In summary, we made a preliminary investigation into the crosscategorial modification ability of Japanese focus particles. The issue was why they can uniformly modify a variety of syntactic categories. Focusing on the additive particle *mo*, we began by arguing against two previous approaches: Kuroda's (1965) *single-meaning + movement approach*, and Rooth's (1985) *meaning-derivation + non-movement approach*.

We then sketched our alternative, a *single-meaning* + *non-movement approach*. Under this approach, every focus particle is assigned only one meaning, as in Kuroda (1965), but none undergoes movement, as in Rooth (1985); every focus particle is interpreted where it overtly occurs. This core idea was implemented by proposing that the meaning of a focus particle is basically an identity function, with its idiosyncratic contribution coded in its non-at-issue content. Our proposal was partially supported by showing that it can answer the first of the following three questions: [1] why *mo* cannot be attached to a universal quantifier; [2] why *mo* cannot be attached to AdvP; and [3] why *mo* cannot be attached to TP.

In conclusion, we discuss possible approaches to the remaining questions. Let us begin with the second question: [2] why *mo* cannot be attached to AdvP. The most puzzling aspect of this question is that AdvP is normally treated as a *modifier*, namely a function element of type **<<e, t>, <e, t>>**. Thus, since we assume that PP can also act as a modifier, it is more appropriate to ask why *mo* can be attached to PP, but not to AdvP, as the following pair shows.

(19) a. **John-wa* [$_{AdvP}$ *hayaku*]-***mo*** *hasit-ta*.
John-Top fast-also run-Past
'John also ran fast.'
b. *John-wa* [$_{PP}$ *gakko-de*]-***mo*** *hasit-ta*.
John-Top school-at-also run-Past
'John also ran at school.'

One answer to this new question is to suggest that PP and AdvP are both modifiers type-theoretically, but the semantics of AdvP is unique in some way, which makes it incompatible with the non-at-issue content of *mo*. If this kind of reasoning is correct, then there should be a focus particle that can modify AdvP, since each focus particle has a different non-at-issue contribution. This possibility is supported by the following contrast between the additive particle *mo* and the contrastive particle *wa*.

(20) a. **John-wa* *musuko-o* [$_{AdvP}$ *karuku*]-***mo*** *sikat-ta*.
John-Top son-Acc lightly-also scold-Past
'John also scolded his son lightly.'
b. *John-wa* *musuko-o* [$_{AdvP}$ *karuku*]-***wa*** *sikat-ta*.
John-Top son-Acc lightly-at.least scold-Past
'John at least scolded his son lightly.'

Thus, it is preferable to derive the inability of *mo* to modify AdvP from the idiosyncratic part of *mo*, because it allows us to preserve our key hypothesis that a focus particle can only modify function elements. That is, even though AdvP is a function element, we may assume that the non-at-issue content of *mo* prevents it from modifying AdvP. If we assume so, then we need to clarify how the semantics of AdvP is unique. This question is left open for the future research.

Finally, let us consider the third question: [3] why *mo* cannot be attached to TP. To begin with, it should be noted that the ban on TP modification is quite general, and it is not limited to the additive particle *mo*. For instance, the contrastive particle *wa* and the scalar particle *sae*, which are crosscategorial modifiers in the same way as the additive particle *mo* is, cannot be attached to TP, as shown in (21).[6]

(21) a. *[$_{\text{TP}}$ *John-wa* [$_{\text{PP}}$ *gakko-de*] *hasit-ta*]-***wa***.
John-Top school-at run-Past-at.least
'At least, John ran at school.'
b. *[$_{\text{TP}}$ *John-wa* [$_{\text{PP}}$ *gakko-de*] *hasit-ta*]-***sae***.
John-Top school-at run-Past-even
'Even, John ran at school.'

Given this, the question should be generalized as follows; why cannot a focus particle be attached to TP?[7] The simplest answer to this question is that TP denotes a proposition, which we have assumed is a meaning of type **t**; TP is not a function element. Thus, since we assume that a focus particle can only modify function elements, it follows that it cannot be combined with TP. Still, this account only holds under *extensional semantics*. In other words, if we adopt *intentional semantics*, whose ontological system assumes the existence of *possible worlds*, then a proposition is defined as an element of type **<s, t>**, namely a function from possible worlds to truth values. This means that a focus particle may modify TP, in principle, because TP acts as a function element under intentional semantics. Therefore, provided that intentional semantics is necessary in any case, we need to seek a different direction for the analysis of the ban on TP modification. One possibility is to extend the above treatment of AdvP to TP; that is, to suggest that TP is a function element type-theoretically, but the semantics of TP is unique in some way, which makes it incompatible with the non-at-issue content of a focus particle. Of course, this account is not justified unless we clarify how the semantics of TP is unique. This question is also left open for the future research.

REFERENCES

Aoyagi, Hiroshi (1998) *On the Nature of Particles in Japanese and Its Theoretical Implications*, Ph.D. dissertation, USC.

Heim, Irene and Angelika Kratzer (1998) *Semantics in Generative Grammar*, Blackwell, Oxford.

Kobuchi-Philip, Mana (2009) "Japanese *Mo*: Universal, Additive, and NPI," *Journal of Cognitive Science* 10, 173–194.

Kotani, Sachie (2008). "A Mismatch between Position and Interpretation: Focus Association with *Even* in Japanese," *Toronto Working Papers in Linguistics* 28:

[6] (21a) is acceptable if the particle *wa* is understood, not as a focus particle, but as a final particle, which female speakers mainly use; they are homonyms, and have totally different meanings.

[7] The exclusive particle *dake* 'only' can be attached to TP. Still, *dake* is not a crosscategorial modifier in the same way *mo* is. For instance, *dake* sounds quite degraded when it is attached to AP or VP.

175–194.

Kuroda, S.-Y. (1965) *Generative Grammatical Studies in the Japanese Language*, Ph.D. dissertation, MIT.

Kuroda, S.-Y. (1969) "Remarks on the Notion of Subject with Reference to Words like *Also*, *Even*, or *Only*. Part 1," *Annual Bulletin* 3, 111–129, Research Institute of Logopedics and Phoniatrics, University of Tokyo.

Mitrović, Moreno and Uli Sauerland (2016) "Two Conjuncts Are Better than One," *Acta Linguistica Hungarica* 63, 471–494.

Partee, Barbara (1987) "Noun Phrase Interpretation and Type-Shifting Principles," *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers*, ed. by Jeroen Groenendijk, Dick de Jongh and Martin Stokhof, 115–143, Foris Publications, Dordrecht.

Rooth, Mats (1985) *Association with Focus*, Ph.D. dissertation, University of Massachusetts, Amherst.

Rubin, Edward (1996) "The Transparent Syntax and Semantics of Modifiers," *The Proceedings of the 15th West Coast Conference on Formal Linguistics*, *WCCFL* 15, 429–440.

Shimoyama, Junko (2006) "Indeterminate Phrase Quantification in Japanese," *Natural Language Semantics* 14, 139–173.

Shudo, Sachiko (2002) *The Presupposition and Discourse Functions of the Japanese Particle Mo*, Routledge, London/New York.

Szabolcsi, Anna (2015) "What Do Quantifier Particles Do?," *Linguistics and Philosophy* 38, 159–204.

Tanaka, Hideharu (to appear) "Japanese *Mo* 'Also': Anti-negative Scope and Stronger Alternatives," *Papers from the 55th Annual Meeting of the Chicago Linguistic Society*, *CLS* 55.

Yatsushiro, Kazuko (2009) "The Distribution of Quantificational Suffixes in Japanese," *Natural Language Semantics* 17, 141–173.