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## A psycholinguistic approach to the acquisition of multifunctionality in Japanese particles wa and ga

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The difference of ga and wa in grammatical characteristics and use has been discussed for a long time by Japanese linguists and grammarians. The correct differentiated uses of these particles are difficult for learners of Japanese as a second language to acquire. Beginners of Japanese make a lot of errors in acquiring them (see Suzuki, 1978, for example). In the first language acquisition of Japanese, the previous studies (Kondo, 1978; Miyazaki, 1979; Hatano, 1979; Hayashibe, 1983) showed that Japanese children acquire functional differentiation very late. The Japanese children begin to use wa and ga as early as in the second year of life (Okubo, 1967; Miyahara and Miyahara, 1973, 1979; Hatano, 1979), but in the early stage the particles are often omitted and the rate of deletion is high. Although omission of ga in two-year-olds decreases to an adult rate that of wa in five-year-olds is still high.

The onset of functional differentiation and correct use of wa and ga has not yet been revealed, and one of the aims of this paper is to ascertain the time of the onset and completion of correct uses of these particles.

Wa and ga are difficult grammatical items to acquire in both first and second languages and there are still parts of unsolved problems in their description in the history of grammatical theories. Our approach is based on the view that wa and ga are a multifunctional complex, which make this grammatical issue more complex. The term, "multifunctionality", is equivalent to "plurifunctionality" as proposed by Karmiloff-Smith (1979), who analyzed the acquisition of French definite and indefinite articles through this concept to express that an article has several functions. In this paper we propose three components of the multifunctionality of wa and ga: (1) syntactic function, (2) referent-comparison function, and (3) discourse function. As for syntactic function, wa marks the topic of the sentence without indicating the case relationship of the preceding NP to the predicate, while ga indicates a specific case, usually the nominative or the subject to the predicate<sup>1</sup>. As for referent-comparison function, we mean contrastive use of wa and exclusive use of ga (see Kuno 1973). The discourse function is based on the information structure, where wa conveys old information and ga conveys new information.

These three functions cannot fully explain the multifunctionality of the two particles. But they are representative and essential characteristics of the usage of wa and ga. In real situations, these functions are not always isolated but often work simultaneously. Actual production and comprehension are based on complex relations such as interaction, interference, competition, or co-occurrence among these functions. Before directly approaching the complexity among functions in language processing, this paper will clarify the process of the acquisition of each function by using psycholinguistic methods as the first step to discuss the relationship among the multiple functions.

#### (1) SYNTACTIC FUNCTION IN WA AND GA

While ga usually marks the nominative case or the subject, wa marks not the case relation but the topic of the sentence. For example, in an active sentence with a transitive verb as the predicate, NP-ga is always the subject of the sentence but NP-wa doesn't necessarily denote the nominative case.

- (1)-1 Sakana wa tabeta.  
[fish] [eat][past-tense]
- (1)-2 Sakana ga tabeta.

Therefore, although the sentence (1)-2 always means "the fish ate (something)," the NP-wa in the sentence (1)-1 can be interpreted not only as the subject but also as the object; especially when the sentence (1)-1 follows such a sentence as "Taro had to eat all kinds of food." The decision of case in the sentence (1)-1 depends on the context or the situation, because wa doesn't possess a case marking function. In other cases the case of NP-wa is decided by lexical semantics. For example, an animate noun is chosen as the subject more than an inanimate noun. But on the other hand, if the sentence (1)-1 is placed in isolation, the NP-wa is often interpreted as the agent.

We call the probability to be interpreted as an agent in NP-wa or NP-ga in these cases the "AGENTIVITY" of wa or ga.

Ito (1982, 1984) performed an experiment on the difference of agentivity between wa and ga. Four adult groups, Japanese native speakers, Japanese-English bilinguals, English-Japanese bilinguals (American teachers of Japanese as a second language) and American learners of Japanese, were instructed to listen to simple sentences consisted of two noun phrases and one transitive action verb such as sawatta (touched), nameta (licked) etc. and to judge which noun was the agent by acting out the sentences using toy animals and objects. Stimulus sentences included three particle combinations: NP-wa and NP without a particle, an NP-ga and an NP without a particle, and an NP-ga and an NP-wa.

The result showed that the NP with one of the two particles always obtained higher agentivity than the NP with no particle.

The highest agentivity of ga was gained in the native speaker group, the lowest agentivity in the second language learners group, and the two bilingual groups were in-between. Only the native speaker group did not rely on non-grammatical clues in processing sentences with an NP-ga. The agentivity of wa in comparison with a no particle NP was also high in all the subject groups, with no statistically significant differences among the groups. All the groups often used non-grammatical clues.

The Japanese native speakers typically responded to NP-ga depending not on non-grammatical clues but on the grammatical rule of ga as the subject marker, which denotes the agent for those transitive verbs. But in case of NP-wa, they sometimes avoided judging case relations by particles and relied on non-grammatical clues. These differentiated responses can be explained by their basis on Japanese grammar. The other three groups, especially the American learner group, didn't show this differentiated response pattern between wa and ga clearly. It was pointed out that the non-native speakers didn't differentiate subject and topic on the real linguistic performance level. Japanese and Korean are the only known languages that have both one subject marker and one topic marker (Li and Thompson, 1976). The complexity of alternative use of the two markers and the lack of corresponding grammatical devices in their first language, English, prevented the non-native speakers from differentiating wa and ga. The high agentivity of wa in all the groups reflects the actual frequency of wa which mostly substitutes the ga case (Mikami, 1960).

The experiment indicated the psychological reality in distinguishing syntactic function of wa and ga, i.e. topic and subject. Further research to investigate developmental processes of this kind of functional differentiation is needed.

#### (2) REFERENT-COMPARISON FUNCTION IN WA AND GA

In section (1), we said that there is topic usage in wa, and nominative usage in ga. But wa has contrastive usage in addition to topic usage, and ga has exclusive usage in addition to nominative usage.

Contrastive wa is used to contrast two or more items. Sentences including contrastive wa such as "NP<sub>1</sub> wa VP<sub>1</sub>, NP<sub>2</sub> wa VP<sub>2</sub>" can be translated into English as "NP<sub>1</sub> VP<sub>1</sub>, but NP<sub>2</sub> VP<sub>2</sub>".

- (2)-1 Morita wa gakusei desu ga, Ito wa sensei desu.  
[Morita] [student] [is] [but] [Ito] [teacher] [is]  
(Morita is a student, but Ito is a teacher.)

The sentence (2)-1 is a coordinate sentence with two wa's, but according to the context it is possible to omit one of the two clauses. Such sentences have the same form as the sentences with a non-contrastive topic wa.

(2)-2 Morita wa sono shinbun o yonda.  
[Morita] [the] [newspaper] [object] [read]

It is possible to interpret the wa in (2)-2 as either non-contrast topic wa or contrast wa. When the wa in the sentence (2)-2 is interpreted as topic wa, the sentence is interpreted as (2)-3.

(2)-3 Speaking of Morita, he read the newspaper.

But when the wa in (2)-2 is interpreted as contrastive wa, it is translated as (2)-4.

(2)-4 Morita read the newspaper, but Ito didn't read it.

Exclusive ga is used to indicate that the preceding NP stands for the only relevant item(s). NP-ga also can be interpreted as either neutral description or exclusive usage according to the context.

(2)-5 Morita ga kuru.  
[Morita] [comes]

When ga in (2)-5 is interpreted as neutral description ga, the sentence is translated as (2)-6.

(2)-6 Morita comes.

But when the ga in (2)-5 is interpreted as exclusive ga, the sentence is translated as (2)-7.

(2)-7 Only Morita (and not the other people) comes.

In order to examine how the Japanese begin to distinguish contrastive wa and exclusive ga from topic wa and neutral ga, Tahara (1984) performed a series of experiments with subjects ranging from 4 year olds to adults. The experiments had the subjects listen to sentences with wa and/or ga and judge whether the sentence was right or wrong by looking at a picture. The types of sentences used in experiments are shown in Table 1. One example of the experiments (Experiment III) is as follows. Four people with black teeth were drawn in the picture. One of the four was named Taro. Subjects were asked to judge whether the sentence (2)-8 (sentence type d in Table 1) and (2)-9 (sentence type e) is right or wrong by looking at the picture.

- (2)-8 Ha wa Taro ga kuroi.  
[teeth][Taro][black]  
(2)-9 Ha wa Taro wa kuroi.  
[teeth][Taro][black]

Table 1  
Types of Sentence

Experiment	Number of Sentence type	Type of Sentence	Example of Sentence
I	a	NP <sub>1</sub> <u>wa</u> NP <sub>2</sub> ga AdjP	Taro <u>wa</u> Ha ga kuroi
	b	NP <sub>1</sub> <u>ga</u> NP <sub>2</sub> ga AdjP	Taro <u>ga</u> Ha ga kuroi
II	a	NP <sub>1</sub> wa NP <sub>2</sub> <u>ga</u> AdjP	Taro wa Ha <u>ga</u> kuroi
	c	NP <sub>1</sub> wa NP <sub>2</sub> <u>wa</u> AdjP	Taro wa Ha <u>wa</u> kuroi
III	d	NP <sub>2</sub> wa NP <sub>1</sub> <u>ga</u> AdjP	Ha wa Taro <u>ga</u> kuroi
	e	NP <sub>2</sub> wa NP <sub>1</sub> <u>wa</u> AdjP	Ha wa Taro <u>wa</u> kuroi

NP<sub>1</sub>: Taro (boy' name), NP<sub>2</sub>: ha (teeth), AdjP: kuroi (black)  
The underlines indicate not 'stress' but the particles to be compared in each experiment.

If the subject judges ga in the sentence (2)-8 as neutral, and wa attached to Taro in sentence (2)-9 as topic, the sentence (2)-8 is interpreted as (2)-10, and (2)-9 as (2)-11.

- (2)-10 Speaking of teeth, Taro is black. (literal translation)  
(i.e. Taro has black teeth)  
(2)-11 Speaking of teeth, and speaking of Taro, (they are) black  
(i.e. Taro has black teeth)

Therefore it was assumed that the subject would say sentences (2)-8 and (2)-9 would match the picture if the subject regarded ga as neutral and wa as non-contrastive. But when the subject judged ga in the sentence (2)-8 as exclusive and wa attached to Taro in the sentence (2)-9 as contrastive, the sentence (2)-8 would be understood as (2)-12 and the sentence (2)-9 as (2)-13.

- (2)-12 Speaking of teeth, only Taro is black. (literally)  
(i.e. Only Taro has black teeth)  
(2)-13 Speaking of teeth, Taro is black (but someone else isn't black) (literally)  
(i.e. Taro has black teeth, but the other people don't have black teeth)

Therefore it was assumed that the subject would say sentences (2)-8 and (2)-9 wouldn't match the picture if he regarded ga as

exclusive and wa as contrast.\*2 Exactly the same method was used in Experiment I and II.

From the result of these experiments, some insights are gained. First of all, the understanding of the contrastive wa and exclusive ga begins very early in a certain word order. These experiments showed that subjects as young as five years old begin to judge sentences according to contrastive wa and exclusive ga but only in the sentence types d and e. But it requires a long time to acquire referent-comparison function of wa and ga regardless of word order. The age at which subjects judge sentences systematically and correctly according to contrastive wa and exclusive ga in every word order is 13 years old or later.

Second, as far as the sentences have the specific word order like sentence types d and e in Table 1, even younger subjects easily judged particles as contrastive wa or exclusive ga. Since contrastive wa and exclusive ga are emphatic usage, the specific word order is almost always used in natural situations. This would have made the task very difficult in the case of the other sentence types.

Third, in connection to the second problem, there are some cases in which contrastive and exclusive meaning is not understood solely by the particles wa or ga. Even some adults didn't understand contrastive wa and/or exclusive ga in these experiments. Therefore, word order or other devices may be utilized to help the interpretation of contrastive wa or exclusive ga. In other words, wa and ga may not be used alone to mark referential comparisons.

### (3) DISCOURSE FUNCTION IN WA AND GA

In the section (1), we said that wa indicates the topic of a sentence. In discourse level wa is used for indicating old information. In contrast, ga is used for introducing new information.

There are various definitions on old vs. new information among linguists. In this paper, we follow Chafe (1976)'s definition: Given (or old) information is that knowledge which the speaker assumes to be in the consciousness of the addressee at the time of the utterance. So-called new information is what the speaker assumes he is introducing into the addressee's consciousness by what he says.

According to this definition, even if an event or a thing is present in the situation or even if the item had been mentioned in the previous context ("a pre-mentioned item"), it will be new information when the speaker doesn't regard the item as being in the listener's consciousness at the time of utterance. Therefore two concepts of the pre-mentioned item and old information must be distinguished, but it might be probable that the more the speaker mentions it, the more the speaker treats the pre-mentioned item as old information.

Tahara and Ito (1984 a,b) examined experimentally when differentiated use of wa and ga according to the discourse function appear and are completed, and what kinds of processes are concerned in the acquisition of discourse function in wa and ga. The experiment was an elicited production task. The subjects from 4 year olds to adults made stories from sequential pictures and told them to a doll through a toy telephone. Our hypothesis was that subjects use ga for the newly introduced items and wa for the pre-mentioned items.

The result indicated that there were three stages as the stage in the acquisition of discourse function in wa and ga. In the first stage one couldn't differentiate wa and ga according to discourse function. Therefore this stage can be called the pre-acquisitional period. The subjects at the age of 4 and 5 were at this first stage, and they used only ga regardless of the context of stories. In the second stage one began to use wa for the pre-mentioned item, but not constantly. Therefore this second stage can be called the acquisition-period of discourse function in wa and ga. Subjects from 6 to 12 years old were at this stage. In the third stage one could systematically differentiate wa and ga according to each context. Therefore the third stage can be called a completion-period of the pragmatic function of wa and ga. Subjects at this stage, fourteen-year-olds and adults systematically used wa for pre-mentioned items, and ga for newly introduced items.

In the second stage, we observed a developmental "retreat" phenomenon or so called "U-shape curve." This term is a descriptive concept of the following developmental trend: use of wa for pre-mentioned items does not increase monotonously according to age: it increases to the peak at the age of 8, and decreases to the bottom at the age of 10, then increases again. It is interesting that Hayashibe (1983) found a similar curve in similar ages on the relationship of word order and topicalization in the sentence comprehension experiment.

As we have already pointed out, the contextual concept of "a pre-mentioned item" and the concept of "old information" have close relationships, but must not be treated as identical concepts. Adult data in this experiment support this idea. That is, in the task, they didn't always use wa for pre-mentioned items. At the same time the more frequently items were mentioned, the more frequently wa rather than ga tended to be used. These data seem to indicate that a speaker in the third stage uses wa and ga properly according to old vs. new information. Therefore, we suggest that proper use of wa and ga according to discourse function must be explained not by the contextual concept of the newly introduced item vs. the pre-mentioned item, but by the concept of new vs. old information.

## CONCLUSION

In the present study we introduced three major functions of Japanese particles wa and ga: syntactic function (topic wa vs. subject ga), referent-comparison function (contrastive wa vs. exclusive ga), and discourse function (old information wa vs. new information ga). These functions are not only grammatically interrelated such as the relation between the topic and old information, but also interacting or influencing one another in the acquisition process. The acquisition stage of referent-comparison function and that of discourse function are developmentally overlapping. During that period, the developmental "retreat" phenomenon or "U-shape curve" was observed in the use of wa for old information. Furthermore this period is the transitional stage of the development of the judgment of acceptability in "NP-wa NP-ga AdjP" sentences (Tahara, 1984). It is suggested that these functions develop not in isolation but in mutual relation, integrating the complex relationship.

We conclude that the acquisition period of the referent-comparison function and discourse function is as late as junior high school age. We must point out that this period is much later than that of English articles (Maratsos 1976: at preschool age; Warden 1976: at about nine years old) and that of French determiners, mainly articles (Karmiloff-Smith, 1979: at about nine years old). The difference cannot solely be attributed to the methodological problems of the experimental procedure, rather, we regard the complexity of the grammatical clues as more important. The multifunctionality of French articles is more complex than that of English because of the former's distinctive use of gender. The multifunctionality of Japanese wa and ga might be more complex than that of French articles.

But there can be another explanation for the late acquisition of the Japanese particles. That is, their strength as a grammatical cue for interpretation seems weaker than that of English or French. Japanese wa and ga are optionally used and often omitted in the actual language use. Slobin and Bever (1983) attribute this optionality to the children's later acquisition of comprehension of case-relations in Japanese as compared to Turkish which has an obligatory object marker.

In sum, we have pointed out the complexity and difficulty of the acquisition of wa and ga. Further studies are necessary to reveal the interactional complexity in more detail.

## Notes

1. For certain verbs, ga is used as an object marker (see Kuno, 1973). This is another component of multifunctionality of wa and ga, but due to space considerations, we cannot discuss this problem in this paper.

2. Logically it is possible to interpret wa attached to Ha (teeth) in sentences like (2)-8 and (2)-9 as contrastive wa. After the Experiment III, subjects were asked to give the meanings of sentences (2)-8 and (2)-9. There was no subject who understood wa attached to Ha as contrastive wa. This means that wa attached to NP<sub>2</sub> in sentence types d and e is understandable only as topic wa in the situation of this task. Therefore, those cases where wa attached to NP<sub>2</sub> is interpreted as contrastive wa have been omitted from this paper.

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