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THE PROPER TREATMENT OF THE JAPANESE *wa* AND *ga* PARTICLES

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0. Abstract

For modern Linguists, *wa* and *ga* particles constitute one of the most interesting and arduous problems of Japanese Grammar. There are two kinds of logical relations that *wa* particle can mark in different sentence positions. These relations are of set-theoretical and predicative types. However, we do not take for granted that logical relations have their equivalents or one-to-one mappings in languages. We only intend to suggest that, in order to explain both series of particles, we need to recognise their functioning as markers of some logical relations.

On the other hand, our approach accepts that *wa* and *ga* particles present historically motivated ambiguities and that these ambiguities can be explained as the result of a *boomerang* relation between the mentioned classes of morphemes. This kind of opposition is unknown in Structural Linguistics, nevertheless there is much evidence on the material of Japanese grammar that such opposition (defined possibly as a *double privative relation*) should be added to the realm of oppositions that proved to be so useful in language studies.

The ambiguity problem of particles *wa* and *ga* leads to another problem that is also related to the logical concept pair of Universal and Existential quantifiers. In order to explain the intuition (that many Japanese linguists have had) of the relation between the logical quantification and the particles *wa* and *ga*, we need to reinterpret this relation as New/Old information. Viewed as such, the determination part of Logical Quantification appears as a discrete simplification of the continuum of values contained between two poles (Generic and Specific) with a common (null) point of both these antinomies.

1. Introduction

The Modern Japanese particles *wa* and *ga* cannot be explained properly without taking into account the other particles that belong to the same classes of morphemes that *ga* and *wa* represent; i.e., case particles (*kaku-joshi*) and «concordance» particles (*kakari-joshi*). The interpretation according to which *wa* is a marker of the topic and *ga* is a marker of the subject is not satisfactory because it makes use of a deletion rule concerning *ga* particle when the subject is to be topicalised by *wa*. Furthermore, such interpretation is not proper for explaining multiple meanings of the Japanese *wa* and *ga* particles.

In order to make explicit the differences between *wa* and *ga* particles, we should keep in mind the following facts:

1. European grammars are based upon a predicative sentence structure (with obligatory subject).
2. The Japanese sentence is, in this respect, somehow different from that of European languages because its Subject constituent is optional and the Predicate part (Verb or Adjective) alone is sufficient to make a sentence.

Indeed, since in Japanese there is no morphological agreement between Subject and Predicate, the subject is not obligatory and the verb (or adjective) is the only obligatory constituent of the sentence. On the other hand, the particle *ga* can refer to more than one

syntactic functions (such as the Object or the Location) and the particle *wa*, when attached to a subject constituent, is not always a topicalisation marker. As a matter of fact, we can observe the same opposition between *wa* and *ga* when they follow subject or object phrases and when they affect other kinds of phrases.

2. Boomerang opposition between «*wa*» and «*ga*» particles

In Functional Linguistics, three following types of systemic relations (called oppositions) are distinguished in the synchrony (a given state of a language):

- privative oppositions: +/- or marked/unmarked
- equipollent oppositions: C1 versus C2
- gradual oppositions: (C1 (C2 (... (Cn))))

However, during the transitory (evolutive, dynamic¹) phases of linguistic systems, we can encounter important changes that are possible only because categories enter into new oppositional relations between them.

Two traditional points of view:

- 1- equipollent opposition between both particles ***wa/ga***
- 2 - concatenation ***ga*** and ***wa*** with deletion of ***ga***

Our point of view:

- 3 - bilateral (boomerang) relation between ***wa*** and ***ga*** particles

As we consider that both ***wa*** and ***ga*** particles are now undergoing mutational processes, we introduced the **boomerang relation** defined as a special kind of bilateral or double privative opposition. This opposition uses the markedness/ unmarkedness² of linguistic forms with regard to categorial meanings and is, in our view, characteristic of the transitory situations. Thus, we claim that introducing the concepts of opposition and markedness we can capture more properly than before the ambiguous (since complex) character of the Japanese ***wa*** and ***ga***.

3. Logical foundations of the Japanese kernel sentences

Natural Language expressions are produced by mechanisms using two kinds of fundamental operations: **selection** and **combination** thus endowing the language with two-dimensional character³ (Roman Jakobson). The other evidence of the same fact is related to the psychological research where two distinct processes are found to lay at the base of human understanding⁴ of NL expressions (in this case novel noun phrases): **comparison** and **scenario creation** (Edward J. Wisniewski, 1997).

As an example, let us consider two kinds of identity :

- 1) a is b. **p(a)**, (predicative identity of a with respect to b), where p = "is b",
- 2) a belongs to A. (**a ∈ A**) ; i.e.: set-theoretical identity of a.

If we want to formulate both at the same time, we must consider that there are two different orders in sentences : actual (explicit) and virtual (implicit). These orders are called, in classical structural linguistics (F. de Saussure), syntagmatic and paradigmatic axis.

An attempt to formulate the two orders at once could look as follows :

$p(a \in A; b \in B)$ where p = the copula "to be" is a predicative relator (is_a).

The meaning of such a formula would be something like this: «a taken as an element of the set A is to be related to b taken as an element of the set B». However, such parallel treatment of relations should be distinguished from what is known as Restricted Quantification since, in this approach, we are not concerned with quantification problems.

On a somehow higher level of abstraction, we must also recognize that the result of a characteristic function on a universe is equivalent to that of the **abstraction operator** (or lambda operator) when applied to the same universe.

$$\{\text{char. Function}\} \equiv \{\text{abstraction Operator}\}$$

$$a \rightarrow F(x) \quad \equiv \quad \{x: F(x)\} (a)$$

Subject and Topic are special cases of each of the above identities: predicative identity of an argument for Subject and set-theoretical identity of an element for Topic. Let us mention also

¹) Cf. Jakobson R., 1963

²) Givon T., 1995.

³) Cf. Jakobson R. (1959)

⁴) Edward J. Wisniewski (1997)

that for semantic and pragmatic reasons Subject and Topic are often associated in speech processes.

4. Word order

Word order in Japanese can be described by three different positions of the Subject and/or Topic : distant, intermediary or close. From the dynamic point of view, the opposition between morphemes *wa* and *ga* appeared in the intermediate position : $0 < 1 \text{ wa} < \dots < N \text{ wa/ga} > \dots > 1 \text{ ga} > 0$ (see figure 1)

Distant position	Intermediary position	Close position	Reference point
Topic < wa <	Topic wa Subject ga	Subject > ga >	Verb

Fig. 1: Ascending and descending orders

The intermediate position is therefore the common distribution of both Topic and Subject and it constitutes the reason why the «boomerang opposition» between the particles *wa* and *ga* could take place.

5. The Japanese case particles and «concordance» particles revisited

Although we do not pretend to present here an alternative to deep case structure⁵, in order to understand better what is the nature of case relations, let us compare some characteristic features of Attribute Value Logic (AVL) and First Order predicate Logic (FOL). The advantage of AVL with respect to FOL consists in making symbol manipulation more flexible. Namely, owing to AVL not only the problem of order of arguments and that of the predicate arity disappeared but also the representation of structured information became less restricting. Let us recall for instance that the following predicate $p(x,y,z)$ has 3 arguments which must appear in that order, i.e.: x, y and z . If we assign ordinal attributes to these arguments such as $\text{pos1: } x, \text{pos2: } y, \text{pos3: } z$, then obviously we free the order of arguments because the latter is explicitly stated. Thus, we can extrapolate that ideally the kernel syntactic relations can be linearized either in a *morpho-syntactic* or in an *ordino-syntactic* manner. For example, suppose

⁵) On this particular point, cf. WARD Nigel (1992).

that the meaning of a sentence contains a semantic agent. Therefore, using AVL-like logic expressions, it is possible to establish the following correspondences:

(1) <mor case nominative> can be interpreted as <sem actor agent>

(2) <syn order position1> can be interpreted as <sem actor agent>

Roughly (because Natural Languages are in no way *ideal* objects), the first correspondence (1) is characteristic of the Japanese language (Taro: *ga aruite kita*) and the second one (2) is proper to English (Taro came on foot). As the matter of fact, in different languages, we can find both morpho- or ordino-syntactic elements.

In the structure of the Japanese language some grammatical morphemes refer to contiguity (such is the function of case particles) whereas others refer to similarity (morphemes called traditionally in Japanese *kakari-joshi*, i.e.; concordance particles). Therefore, the grammatical theory of the Japanese language should take into account not only syntagmatic (actual, *in praesentia*) relations but also paradigmatic (virtual, *in absentia*) relations. In this paper, we argue that, in Japanese, at least in a simple predicative sentences, Topic seems to be the result of the mapping of a paradigmatic relation into the syntagmatic organisation.

Thus, in our approach, we accept that *wa* and *ga* particles present historically motivated ambiguities and that these ambiguities can be explained as the result of a *boomerang* relation of the mentioned classes of morphemes.

6. Element Particles (*wa, mo, koso, sae*)

Generally speaking, the element particles are markers of *absolute and relative identity* in the set-theoretical sense. The figure 2 shows how some of these particles can be classified according to the criterion of belonging of a chosen element to a virtual set.

	absolute identity	relative identity
simple belonging	a wa <i>indication</i>	b mo <i>comparison</i>
complex belonging	a koso <i>insistence</i>	b sae <i>concession</i>

Fig. 2: Particles marking identity of an element belonging to a set or to a subset

1) *wa* is the marker of belonging of the element *a* to the set *A*; i.e.: $aRa, (a \in A)$

2) *mo* is the marker of belonging of the element *b* to the set *A*, this belonging being established with respect to *a* which is another element belonging to the same set *A*; i.e.: $bRa, (b \in A) \& (a \in A)$

3) *koso* is the marker of belonging of the element *a* to the set *A*, the latter set *A* being a subset of *B*; i.e.: $aRa, (a \in A) \& (A \subseteq B)$

4) *sae* is the marker of belonging of the element *b* to the set *B*, the set *B* being a subset of *A* and the identity of *b* is established by contrast with *a*; i.e.: $bRa, (b \in B) \& (a \in A) \& (B \subseteq A)$

NB: In addition, *wa* and *koso* particles are markers of reflexive relations.

We have used here what has been called «attributive relations» (cf. [Desclés J.-P., 1987]); i.e.: (a) as a relation of belonging and (b) as the subset relationship. As the matter of fact, the attributive relations can be seen as the result of a kind of predicative projection between elements of a virtual (paradigmatic) axis such as a Subject and those of the actual (syntagmatic) axis such as the attribute part of the Predicate. Consider the sentence where element particles may occur alternatively:

Tori *wa* naku. (*wa* has no equivalent in English) /Birds sing./- «Birds belong to the set of beings that can execute the action of singing»

Tori *mo* naku. (*mo* corresponds to «also», «even» etc.) /Birds also sing./ - «Birds belong to the set of beings that can execute the action of singing, this belonging is established with respect to other beings that have the same property»

Tori *koso* naku. (*koso* corresponds to «exactly,» «just» etc.) /It is birds that sing./ «Birds belong to the set of beings that can execute the action of singing, this set is seen as a subset of another set.»

Tori *sae* naku. (*sae* corresponds to «even», «also» etc.) /Even birds sing./ «Birds belong to the set of beings that can execute the action of singing, this set is a superset of another set and the identity of birds is established by contrast with that of beings belonging to the subset.

Table 1 shows the syntagmatic relations

between Japanese argument particles and element particles.

Table 1: Case and 'concordance' particles in Modern Standard Japanese (*cp* = case particle)

Case name	cp	cp+wa	cp+mo
nominative	ga	*)	*)
accusative	o	o-ba**)	o mo
dative	ni	ni wa	ni mo
allative	e	e wa	e mo
instrumental	de	de wa	de mo
comitative	to	to wa	to mo
ablative	kara	kara wa	kara mo
terminative	made	made wa	made mo

*) Neither *ga+wa* nor *ga+mo* are possible.

***o-ba* is no more used.

It is very important for our purpose to notice that neither **ga+wa* nor **ga+mo* are grammatically correct⁶). Although as such *wa* and *ga* particles belong to different classes (*wa* is representative for set-theoretical relations - Element's identity or image - on the one hand and *ga* is representative for predicative relations - Argument - on the other), but their usage is such that they interact in a way that the system which combines *argument* particles with *element* particles seems to be changing in contemporary Japanese. If we represent predicative relations by the horizontal axis, *ga₁* as a nominative (though sometimes ambiguous) case marker goes not only together with *o* as an accusative case marker, but also with the particles *wa₂* and *mo₂*. Analogously, if we represent set-theoretical relations by the vertical axis, *wa₁* as an exocentrically oriented (reflexive) identity marker goes not only together with *ga₂* as an endocentrically oriented (reflexive) identity marker, but also with the particles *o₂* and *mo₁*. Thus, we observe that the «boomerang opposition» described above is the result of interactions between «cases» and «elements» in the dynamic synchrony of the standard Japanese syntax.

⁶) The dialects of Kyushu where the combination of *ga* and *wa* is possible cannot be taken as a proof of the contrary because dialects develop their own structures

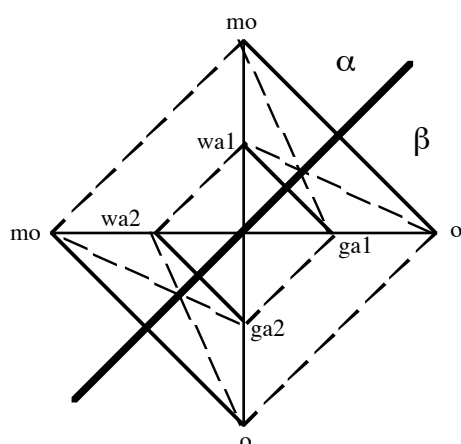


Fig. 3: The interaction between the case particles *ga* and *o* and the element particles *wa* and *mo*

In figure 3, we did not distinguish clearly neither between mo_1 and mo_2 nor between o_1 and o_2 because, as the matter of fact, there is still not as much difference between them as between wa_1 and wa_2 , on the one hand, and between ga_1 and ga_2 , on the other hand, in contemporary Japanese.

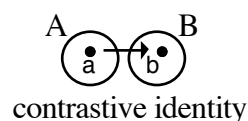
The evidence of the Japanese language allows us to consider that there is a certain point where two apparently different logics should meet, namely the predicate and the set-theoretical calculi. Since it is possible to consider that some predicates enter into relations with some others, we can say that the extension of a predicate determines its **meaning** (or **comprehension**). Therefore *set*, *predicate* and *meaning* are closely related concepts (i.e.: they cannot be defined separately). However, if we consider **predicate** or **set** to be *primitive concepts* respectively, then we will be able to derive the remaining two.

7. Contrast and Negation

It is rather logical that the particle *wa* can be used with a contrastive meaning, too. The reason for this is that two elements of the same set may differ by a part of their characteristics.

Shin'ichirō wa hidari-gawa ni, gakusei wa mi-gi-gawa ni seki o shimeta.

Shin'ichirō took the seat on the left side and the students on the right side.



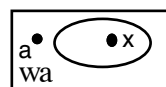
There is also a pseudo-contrastive meaning in sentences with negation. Let the sentence be of the **A wa C de wa nai** type. The interpretation we can give implies the existence of three entities : A, B and C.

A does not exist as C (but it does exist as B).

As a matter of fact, we consider that the morpheme *wa* in the phrase **C de wa nai** refers to a paradigmatic (virtual) relation. Its value is therefore «identity of an item C not belonging to the set A; i.e.: being in complementary relation as to A». In order to understand this, we have to go through the following logical reasoning:

[A is not C] implies [A is B]

N.B.: In those cases where we would like to say «A is not B», we can simply say **A wa B de nai**. (without the particle *wa* in the second phrase).



negative identity

Here again, we notice that since the particle *wa* has been classified as element particle, there are other morphemes that can be used instead of *wa* in the «attributive» part of identity sentences. The sentence **A wa D de mo nai** means that «A does not even exist as D (but that it may exist as B and C)». For instance:

Ichī-nen Nihongo o benkyō-shita no ni, mada hiragana mo yoku yomemasen.

(Although I was learning the Japanese language for one year, I cannot even read well hiragana yet.)

In the above example, hiragana syllabary is related to katakana and to kanji. It seems therefore possible to recover the following logical reasoning:

A is B. ---> A is neither C nor D.

8. Suggestion on Topicalisation

The Topic-Comment relation should probably be defined as a mapping between a linguistic unit produced as a result of applying the selectional mechanisms and the unit produced as a result of applying the combinatorial

mechanisms.

9. Conclusion

The evidence of *wa* and *ga* particles leads to the following conclusion: in Natural Languages, depending on the degree of complexity of linguistic units different logics should be combined beginning with the Propositional Logic (i.e.: Zero Order Predicate Logic), passing through Modal Logics and ending with yet undiscovered logical systems.

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