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## EXHAUSTIVE-LISTING *ga* CONSTRUCTIONS

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### 0. INTRODUCTION

In Kuno (1973), he differentiated two uses of Japanese particle *ga*; that is, the descriptive *ga* and the exhaustive-listing *ga*. For example,

(1) Goran, John *ga* yatte kuru.

'Look! John is coming.'

(2) John *ga* kasikoi.

'(Of all the persons under discussion) John (and only John) is intelligent; it is John who is intelligent.'

*ga* in(1) is considered to be the descriptive *ga*, while *ga* in(2) is regarded as the exhaustive-listing *ga*. In many sentences, however, the particle *ga* marking their subjects can be identified either as the descriptive *ga* or as the exhaustive-listing *ga*.

(3) John *ga* Mary o nagutta.

a. 'John hit Mary.'

b. 'It was John who hit Mary.'

As the above two ways of English translation indicate, (3) can be interpreted either as describing a mere event of John's hitting Mary or as having the special connotation that John is the only one under consideration who hit Mary. However, in some sentences, only the exhaustive-listing interpretation is possible. (2) is one of these sentences.

Henceforth in this paper, I call those sentences 'exhaustive-listing *ga* constructions' (ELGC's) whose subject-marking *ga* is obligatorily (or most likely) to be identified as the exhaustive-listing *ga*. The main purpose of this paper is to investigate their syntactic and semantic properties within a version of framework of the so-called Montague Grammar.

### 1. CONSTRAINT ON THE DESCRIPTIVE *ga*

In Shirai (1981a), I proposed the following constraint on the descriptive *ga* in

terms of Carlson's ontological distinction between 'individuals' and 'stages'.

(4) (Shirai, 1981a : 48)

For a sentence whose subject is marked with *ga* to be interpreted as a neutral description, its predicate-phrase is required to apply to stages.

Before giving a brief account of this constraint, a few comments on Carlson's ontology will be in order.

According to Carlson (1978), entities are divided into 'individuals' and 'stages'.<sup>1)</sup> Stages are, as it were, time-space slices of individuals. In his view, an individual is considered to be "that whatever-it-is that ties a series of stages together to make them stages of the same thing" (ibid., 68), while stages are regarded as spatio-temporal manifestations or realizations of an individual. To formulate the relationship between stages and individuals, Carlson introduced a relation *R*. If *a* is a stage and *b* is an individual, *R* (*a*, *b*) asserts that the stage *a* realizes the individual *b* at a given spatio-temporal point. What is most significant in Carlson (1978) is that he classifies English predicates according to whether they apply basically to individuals or stages. This idea corresponds to a kind of 'ontological' lexical decomposition of the internal semantic make-up of predicates.

To illustrate the constraint presented in (4), let us consider (2) and (3). In conformity to Carlson's framework, "kasikoi" in (2) is regarded as applying directly to individuals.<sup>2)</sup> Hence this constraint correctly predicts that (2) cannot receive the neutral description interpretation. On the other hand, "naguru" in (3) basically applies to stages. In (3) this predicate designates a certain relation between John's stage and Mary's stage, not between the individuals named John and Mary. Consequently, (3) can be given the neutral description interpretation.

The above constraint, it seems to me, enables us to provide most of ELGC's such as (3) with their semantic characterization. In the subsequent sections, I will discuss other types of ELGC's and show that they can also be explicated on this constraint.

## 2. EXISTENTIAL PRESUPPOSITION AND DYNAMIC DISCOURSE MODEL

Compare the following sentence with (3):

(5) *Watasi ga Mary o nagutta.*

'It was I who hit Mary.'

(6) *Kono otoko ga Mary o nagutta.*

'It was this man who hit Mary.'

These sentences are most likely to receive the exhaustive-listing interpretation. What distinguishes them from (3) is the fact that their subject NP's are strongly associated with 'existential presupposition'. The referents of such NP's as "watasi" ('I') and "kono otoko" ('this man') should be presupposed in the discourse, and they are supposed to have already been established or 'registered' in the universe of discourse. It is true that the referent of "John" in (3) might be known to the hearer as well as the speaker, but this does not mean that this referent has been registered in the universe of discourse. If it has already been introduced into the register of discourse, the subject NP in (3) will be marked with *wa*. On the other hand, the speaker is supposed to be universally registered in the universe of discourse. Hence subject NP's designating the speaker are always marked with *wa*, not with *ga*, unless they are used in exhaustive-listing statements. What I have in mind in employing the term 'existential presupposition' is a pragmatically defined dynamic discourse model with a mechanism of the register of discourse.

These informal observations can be formalized within a version of Montague Grammar Framework presented in Shirai (1981a). Within this framework, (3) will finally translate into the following expression of Intensional Logic (IL) :

$$(7) \exists z^s \exists u^s [R(z^s, j) \ \& \ R(u^s, m) \ \& \ \mathbf{naguru}^+(z^s, u^s)]$$

(7) means that some John's stage stands in the 'hit'-relation with some Mary's stage. With the Meaning Postulate (MP) given in (8), we can infer from (7) that there are objects named John and Mary.<sup>3)</sup>

$$(8) \text{MP} : \forall x^i \square [[\exists z^s [R(z^s, x^i)]] \rightarrow \mathbf{Exist}'(x^i)]$$

This MP states that if some individual has a stage, then it can be said to 'exist'. It is quite natural to posit such a MP, since it will be interpreted as constituting a part of the definition concerning the notions of stages and individuals. Note here that in this paper we are concerned with a dynamic discourse model in which entities to be registered in the universe of discourse are changing and increasing according as the discourse develops. Therefore, the operator "**Exist'**" in (8) should be interpreted in accordance with this discourse model.

Now consider (5). This sentence will finally translate into :

$$(9) \exists z^s \exists u^s [R(z^s, I) \ \& \ R(u^s, m) \ \& \ \mathbf{naguru}^+(z^s, u^s)]$$

Again, employing the MP in (8), we can infer from (9) that there is an object corresponding to the speaker; that is, (5) plays the role of introducing the speaker into the

discourse. However, this sounds very odd, because the speaker is, as mentioned before, is supposed to exist universally in the discourse irrespective of the developing of discourse. This is, I think, the very reason why (5) is not likely to receive the neutral description interpretation. This way of reasoning can be applied to (6). As the demonstrative "kono" ('this') indicates, the referent of "kono otoko" has been established in the universe of discourse either anaphorically or situationally when (6) is uttered. Hence (6) is also most likely to be given the exhaustive-listing interpretation. Incidentally, the discussion in this section reveals that syntactic considerations alone will not suffice for the explication of ELGC's.

### 3. DOUBLE-NOMINATIVE CONSTRUCTIONS

In this section, I will discuss another type of ELGC's. Observe the following sentences :

(10) John ga Mary ga suki -da.

'It is John who likes Mary.'

(11) John ga okane ga hituyoo -da.

'It is John who needs money.'

(12) John ga Nihongo ga umai.

'It is John who is good at Japanese.'

(13) A-class ga zyosi ga yoku dekiru.

'It is Class A that the girls do well in.'

(14) New York ga koosoo-kentiku ga takusan tatte-iru.

'It is New York that many high-rise buildings exist standing in.'

These sentences are usually called 'double-nominative constructions', which are schematically represented as :

(15) NP<sub>1</sub>-ga NP<sub>2</sub>-ga Pred.

NP's in these sentences are most likely to have the exhaustive-listing connotation, as shown in their English translations.

Although Sentences (10)-(14) apparently conform to the same sentence schema given in (15), they do not syntactically form a uniform class. It can be easily shown that (10)-(12) should be distinguished from (13)-(14). First, if NP<sub>1</sub>'s are eliminated in (10)-(12), elliptical sentences will be obtained, while this is not the case

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in (13)–(14). Secondly, NP<sub>1</sub>'s in (10)–(12) are selectionally restricted by their predicates. Observe, for instance, the following anomalous sentences :

- (16) \*Kono isi ga Mary ga suki-da.  
 ‘\*It is this stone which likes Mary.’
- (17) \*Kono isi ga okane ga hituyoo-da.  
 ‘\*It is this stone which needs money.’
- (18) \*Kono isi ga Nihongo ga umai.  
 ‘\*It is this stone which is good at Japanese.’

On the other hand, NP<sub>1</sub>'s in (13)–(14) are not selectionally restricted by their predicates themselves, but rather they are semantically restricted by the whole ‘NP<sub>2</sub>-*ga* Pred’ phrases.

### 3.1 SENTENCES WITH OBJECT MARKING *GA*

I will first discuss such sentences as (10)–(12). There has been much debate over the syntactic treatment of these sentences in the literature of the traditional Japanese Transformational Grammar. In this paper, however, I assume with Kuno (1973) that they are to be generated as such and that their object NP's (i.e., NP<sub>2</sub>'s in the schema of (15)) are directly marked with *ga*. In Shirai (1981b), I discussed these sentences at some length, and argued that their predicates are to be characterized as denoting (two-place) relations which hold between individuals themselves (ibid., 203–4). Consequently, it follows that the constraint given in (4) correctly predicts that NP<sub>1</sub>'s in these sentences are to have the exhaustive-listing connotation.

### 3.2 ‘SUBJECTIVIZATION’

Now, I will turn to the other type of double-nominative constructions such as (13) and (14). According to Kuno (1973), (13) will be derived from (19) by a transformational operation called ‘Subjectivization’, which is given in (20).

- (19) A-class no zyosi ga yoku dekuru.  
 “It is the girls in Class A that do well.”

- (20) (Kuno, 1973: 71)  
*Subjectivization* (tentative formulation) [ optional ]  
 Change the sentence-initial NP-*no* to NP-*ga*, and make it the new subject

of the sentence.

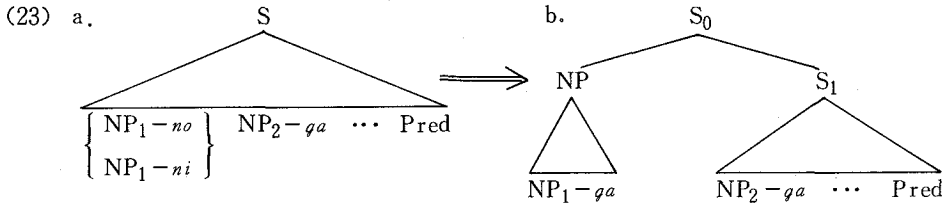
As Kuno remarks, his formulation in (20) is no more than tentative. For example, this formulation, as it is, cannot prevent (21-a), which is clearly ill-formed, from being derived from (21-b).<sup>4)</sup>

- (21) a. \*Kinoo ga sinbun ga koko ni aru.  
 b. Kinoo no sinbun ga koko ni aru.  
 'Yesterday's newspaper is here.'

Kuno subsequently (*ibid.*, 76-8) extends 'Subjectivization' to apply not only to the sentence-initial NP-no but also to the sentence-initial NP-ni. Thus, he supposes that (14) will be derived from (22) by his extended version of 'Subjectivization'.

- (22) New York ni koosoo-kentiku ga takusan tatte-iru.  
 'In New York there are many high-rise buildings standing.'

Judging from what Kuno states in Kuno (1978, 242-7), it is clear that he assumes the following sort of structural change in the operation of 'Subjectivization', though this is not explicitly stated in (20) :



In (23-b), the new subject NP<sub>1</sub> derived by 'Subjectivization' is considered to be outside the simplex S<sub>1</sub>.

However, there seems to be no convincing reason why we should not directly generate such structures as represented in (23-b). Rather, as Shibatani and Cotton (1977) point out, it seems more appropriate to posit such independent structures. First, note that there are some semantic differences between those sentences which are alleged to be formed by 'Subjectivization' and their original sentences. For instance, compare (13) with (19). (13) is a statement about 'Class A', while (19) is a statement about 'the girls in Class A'. Secondly, it should be noted that among the putative outputs of 'Subjectivization' it is rather much restricted class of sentences that count as quite natural. For example, (21-a) seems to be absolutely unnatural. In Shibatani and Cotton (1977), they provide us with a number of other examples which fail to undergo 'Subjectivization' even though they conform to Kuno's formulation of 'Subjectivization'.

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Some of them are given in :

(24) a. Taroo no hon ga taoreta.  
'Taro's book fell down.'

b. \*Taroo ga hon ga taoreta.

(25) a. Yamada sensei no tyosyo ga soko ni aru.  
'Professor Yamada's writings are there.'

b. \*Yamada sensei ga tyosyo ga soko ni aru.

(26) a. Koobe ni siriai no gaizin ga sunde iru.  
'A foreigner that I know lives in Kobe.'

b. \*Koobe ga siriai no gaizin ga sunde iru.

cf. (27) a. Koobe ni gaizin ga takusan sunde iru.

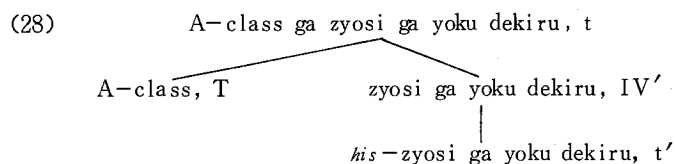
'Many foreigners live in Kobe.'

b. ?Koobe ga gaizin ga takusan sunde iru.

'It is Kobe where many foreigners live.'

In view of what we have so far observed, it seems quite doubtful to posit such a syntactic operation as 'Subjectivization', which has a large number of 'exceptions' in its application. Hence, in this paper, I assume with Shibatani and Cotton (1977) that the two types of structures represented in (23-a) and (23-b) are to be generated independently. However, I continue to use the term 'Subjectivization' for expository purposes.

Now, I go on to show how to formulate sentences such as (13) and (14) within our framework. Take (13), for example. I assume that this sentence will be (partially) analyzed as follows :<sup>5)</sup>



To derive the phrase "zyosi ga yoku dekiru" from the phrase "his-zyosi ga yoku dekiru", we require a kind of 'derived verb phrase rule', whose formulation is given as S10 and T10 in Section 4.2. This rule creates new IV'-expressions designating sets of individuals. In this paper, I distinguish two types of predicate phrases (IV-phrases and IV'-phrases). IV-phrases designate sets of stages, and their semantic types are  $\langle e^s, t \rangle$ . IV'-phrases designate sets of individuals, and their semantic types are  $\langle e^i, t \rangle$ . It



follows from the constraint given in (4) that sentences such as (13) receive the exhaustive-listing interpretation.

#### 4. FRAGMENT

In this section, I present a fragment of Japanese containing those sentences that are of our primary concern in this paper, and give their formulations within our framework. This will serve the purpose of clarifying the foregoing discussions.

##### 4.1 SYNTACTIC CATEGORIES AND SEMANTIC TYPES

Category	Type
t (sentences)	t
CN (common nouns)	$\langle e^i, t \rangle$
T (term phrases)	$\langle \langle s, \langle e^i, t \rangle \rangle, t \rangle (= f(T))$
IV (VP phrases)	$\langle e^s, t \rangle (= f(IV))$
IV' (VP' phrases)	$\langle e^i, t \rangle (= f(IV'))$
TV (transitive-verb phrases)	$\langle \langle s, f(T) \rangle, f(IV) \rangle$
TV' (transitive-verb phrases)	$\langle \langle s, f(T) \rangle, f(IV') \rangle$
t' (subordinate clauses)	$t^{\delta}$

##### 4.2 SYNTACTIC RULES AND TRANSLATION RULES

S1 : If  $\alpha \in P_{CN}$ , then  $F_1(\alpha) \in P_T$  and  $F_1(\alpha) = \alpha$ .

T1 : If  $\alpha$  translates into  $\alpha'$ , then  $F_1(\alpha)$  translates into  $\lambda PP \{ \iota x^k \forall y^o \square [R'(y^o, x^k) \leftrightarrow \alpha'(y^o)] \}$ .<sup>7)</sup>

S2 : If  $\alpha \in P_T$  and  $\beta \in P_{IV'}$ , then  $F_2(\alpha, \beta) \in P_t$  and  $F_2(\alpha, \beta) = \alpha \text{ wa } \beta$ .<sup>8)</sup>

T2 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_2(\alpha, \beta)$  translates into  $\alpha' (\wedge \beta')$ .

S3 : If  $\alpha \in P_T$  and  $\beta \in P_{IV}$ , then  $F_3(\alpha, \beta) \in P_t$  and  $F_3(\alpha, \beta) = \alpha \text{ ga } \beta$ .

T3 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_3(\alpha, \beta)$  translates into  $\alpha' (\wedge \lambda x^i \exists z^s [R(z^s, x^i) \& \beta'(z^s)])$ .

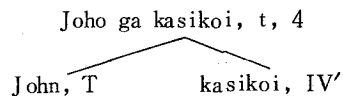
S4 : If  $\alpha \in P_T$  and  $\beta \in P_{IV'}$ , then  $F_4(\alpha, \beta) \in P_t$  and  $F_4(\alpha, \beta) = \alpha \text{ ga } \beta$ .

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- T4 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_4(\alpha, \beta)$  translates into  $\alpha'(\wedge \lambda y^i [y^i = \epsilon x^i [\beta'(x^i)]]]$ .
- S5 : If  $\alpha \in P_{IV}$ , then  $F_5(\alpha) \in P_{IV'}$  and  $F_5(\alpha) = \alpha$ .
- T5 : If  $\alpha$  translates into  $\alpha'$ , then  $F_5(\alpha)$  translates into  $\lambda x^i \exists z^s [R(z^s, x^i) \& \alpha'(z^s)]$ .
- S6 : If  $\alpha \in P_{TV}$  and  $\beta \in P_T$ , then  $F_6(\alpha, \beta) \in P_{IV}$  and  $F_6(\alpha, \beta) = \beta \circ \alpha$ .
- T6 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_6(\alpha, \beta)$  translates into  $\alpha'(\wedge \beta')$ .
- S7 : If  $\alpha \in P_{TV'}$  and  $\beta \in P_T$ , then  $F_7(\alpha, \beta) \in P_{IV'}$  and  $F_7(\alpha, \beta) = \beta \circ \alpha$ .
- T7 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_7(\alpha, \beta)$  translates into  $\alpha'(\wedge \beta')$ .
- S8 : If  $\alpha \in P_T$  and  $\beta \in P_{IV}$ , then  $F_8(\alpha, \beta) \in P_{t'}$  and  $F_8(\alpha, \beta) = \alpha \circ \beta$ .
- T8 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_8(\alpha, \beta)$  translates into  $\alpha'(\wedge \lambda x^i \exists z^s [R(z^s, x^i) \& \beta'(z^s)])$ .
- S9 : If  $\alpha \in P_T$  and  $\beta \in P_{IV'}$ , then  $F_9(\alpha, \beta) \in P_{t'}$  and  $F_9(\alpha, \beta) = \alpha \circ \beta$ .
- T9 : If  $\alpha, \beta$  translate into  $\alpha', \beta'$  respectively, then  $F_9(\alpha, \beta)$  translates into  $\alpha'(\wedge \beta')$ .
- S10 : If  $\phi \in P_{t'}$  and  $\phi = his_n \alpha \circ \beta$  ( $\alpha \in PCN, \beta \in P_{IV} \cup P_{IV'}$ ), then  $F_{10}, n(\phi) \in P_{IV'}$  and  $F_{10}, n(\phi) = \alpha \circ \beta$ .<sup>9)</sup>
- T10 : If  $\phi$  translates into  $\phi'$ , then  $F_{10}, n(\phi)$  translates into  $\lambda x_n^i \phi'$ .
- S11 : If  $\alpha \in PCN$ , then  $F_{11}, n(\alpha) \in P_T$  and  $F_{11}, n(\alpha) = his_n \alpha$ .<sup>10)</sup>
- T11 : If  $\alpha$  translates into  $\alpha'$ , then  $F_{11}, n(\alpha)$  translates into  $\lambda PP \{ \epsilon x^o [\alpha'(x^o) \& Poss'(x_n^i, x^o)] \}$ .<sup>11)</sup>

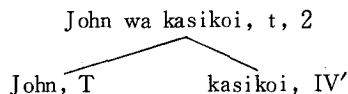
4.3 EXAMPLES<sup>12)</sup>

(1) John ga kasikoi.



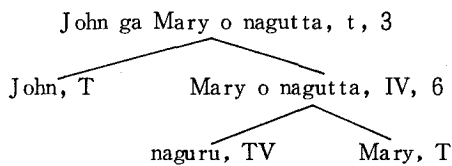
John =><sup>13)</sup>  $\lambda PP\{j\}$       kasikoi => **kasikoi'**  
 John ga kasikoi  
 =>  $\lambda PP\{j\} (\wedge \lambda y^i [y^i = \epsilon x^i [\mathbf{kasikoi}'(x^i)]]])$   
 =>  $[j = \epsilon x^i [\mathbf{kasikoi}'(x^i)]]]$

(2) John wa kasikoi.



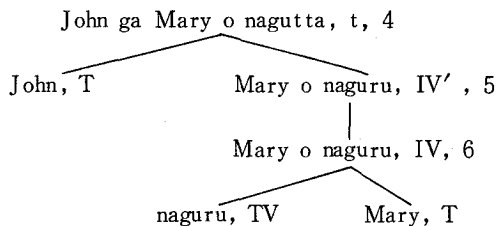
John =>  $\lambda PP\{j\}$       kasikoi => **kasikoi'**  
 John wa kasikoi  
 =>  $\lambda PP\{j\} (\wedge \mathbf{kasikoi}' )$   
 => **kasikoi'** (j)

(3) John ga Mary o nagutta. (neutral description)



John =>  $\lambda PP\{j\}$       Mary =>  $\lambda QQ\{m\}$   
 naguru =>  $\lambda P\lambda u^s P\{\wedge \lambda x^i \exists w^s [R(w^s, x^i) \ \& \ \mathbf{naguru}^+(u^s, w^s)]\}$   
 Mary o naguru =>  $\lambda u^s \exists w^s [R(w^s, m) \ \& \ \mathbf{naguru}^+(u^s, w^s)]$   
 John ga Mary o nagutta  
 =>  $\lambda PP\{j\} (\wedge \lambda x^i \exists z^s [R(z^s, x^i) \ \& \ \exists w^s [R(w^s, m) \ \& \ \mathbf{naguru}^+(z^s, w^s)]]])$   
 =>  $\exists z^s \exists w^s [R(z^s, j) \ \& \ R(w^s, m) \ \& \ \mathbf{naguru}^+(z^s, w^s)]]$

(4) John ga Mary o nagutta. (exhaustive listing)



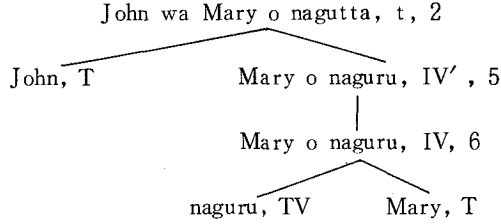
John =>  $\lambda PP\{j\}$       Mary =>  $\lambda QQ\{m\}$   
 naguru =>  $\lambda P\lambda u^s P\{\wedge \lambda x^i \exists w^s [R(w^s, x^i) \ \& \ \mathbf{naguru}^+(u^s, w^s)]\}$   
 Mary o naguru, IV'  
 =>  $\lambda x^i \exists z^s [R(z^s, x^i) \ \& \ \exists w^s [R(w^s, m) \ \& \ \mathbf{naguru}^+(z^s, w^s)]]]$

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John ga Mary o nagutta

$\Rightarrow [j = \iota x^i \exists z^s \exists w^s [R(z^s, x^i) \& R(w^s, m) \& \mathbf{naguru}^+(z^s, w^s)]]$

- (5) John wa Mary o nagutta.



John  $\Rightarrow \lambda PP \{j\}$

Mary  $\Rightarrow \lambda QQ \{m\}$

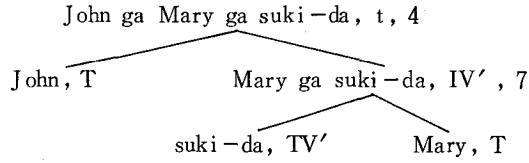
naguru  $\Rightarrow \lambda P \lambda u^s P \{ \wedge \lambda x^i \exists w^s [R(w^s, x^i) \& \mathbf{naguru}^+(u^s, w^s)] \}$

John wa Mary o nagutta

$\Rightarrow \lambda PP \{j\} ( \wedge \lambda x^i \exists z^s [R(z^s, x^i) \& \exists w^s [R(w^s, m) \& \mathbf{naguru}^+(z^s, w^s)]] )$

$\Rightarrow \exists z^s \exists w^s [R(z^s, j) \& R(w^s, m) \& \mathbf{naguru}^+(z^s, w^s)]$

- (6) John ga Mary ga suki-da.



John  $\Rightarrow \lambda PP \{j\}$

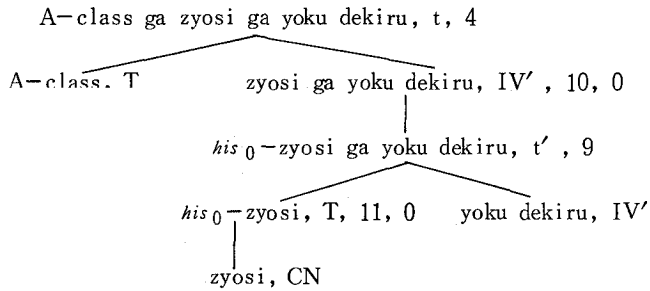
Mary  $\Rightarrow \lambda QQ \{m\}$

suki-da  $\Rightarrow \lambda P \lambda x^i P \{ \wedge \lambda y^i [\mathbf{sukida}^+(x^i, y^i)] \}$

Mary ga suki-da  $\Rightarrow \lambda x^i [\mathbf{sukida}^+(x^i, m)]$

John ga Mary ga suki-da  $\Rightarrow [j = \iota x^i [\mathbf{sukida}^+(x^i, m)]]$

- (7) A-class ga zyosi ga yoku dekuru.



A-class  $\Rightarrow \lambda PP \{c\}$

zyosi  $\Rightarrow \mathbf{zyosi}'$

yoku dekuru  $\Rightarrow \mathbf{yoku-dekuru}'$

$his_0 - zyosi \Rightarrow \lambda_{QQ} \{ \iota_{x^0} [ \mathbf{zyosi}'(x^0) \ \& \ \mathbf{Poss}'(x_0^i, x^0) ] \}$   
 $his_0 - zyosi \text{ ga } yoku \text{ dekiru}$   
 $\Rightarrow \mathbf{yoku-dekiru}'(\iota_{x^0} [ \mathbf{zyosi}'(x^0) \ \& \ \mathbf{Poss}'(x_0^i, x^0) ])$   
 $zyosi \text{ ga } yoku \text{ dekiru}$   
 $\Rightarrow \lambda_{x_0^i} [ \mathbf{yoku-dekiru}'(\iota_{x^0} [ \mathbf{zyosi}'(x^0) \ \& \ \mathbf{Poss}'(x_0^i, x^0) ])]$   
 $A\text{-class } ga \ zyosi \text{ ga } yoku \text{ dekiru}$   
 $\Rightarrow [ c = \iota_{x^i} [ \mathbf{yoku-dekiru}'(\iota_{x^0} [ \mathbf{zyosi}(x^0) \ \& \ \mathbf{Poss}'(x^i, x^0) ])] ]$

## 5. CONCLUSION

In this paper, I have shown that there are two factors relevant to the characterization of ELGC's. One of them is the semantic nature of the predicate phrases of sentences. When predicate phrases designate directly sets of individuals, the corresponding sentences whose subjects are marked with *ga* receive the exhaustive-listing interpretation. I proposed that two types of predicate phrases should be distinguished; that is, IV-phrases and IV'-phrases. Semantically, IV-phrases designate sets of stages, while IV'-phrases designate sets of individuals. Hence the fact that sentences such as (2) and (10)-(14) receive the exhaustive-listing interpretation is given a formal account. The other relevant factor is the semantico-pragmatic nature of subject noun phrases. When subject noun phrases marked with *ga* are strongly associated with existential presupposition, the corresponding sentences are likely to receive the exhaustive-listing interpretation on pragmatic grounds. This explains the fact that sentences such as (5) and (6) are most likely to be interpreted as exhaustive listing. Furthermore, by setting up a dynamic discourse model with the MP given in (8), this latter factor concerning ELGC's is explicitly formulated in our framework.

## NOTES

1) To be more precise, Carlson divides entities into 'stages', 'objects', and 'kinds'; as shown in the following figure :

$$\text{ENTITY} \left\{ \begin{array}{l} \text{STAGE} \\ \text{OBJECT} \\ \text{KIND} \end{array} \right\} \text{INDIVIDUAL}$$

However, for the constraint given in (4), the distinction between stages and individuals (i.e., objects and kinds) is crucial.

- 2) For arguments for this contention, see Shirai (1981a).
- 3) This MP corresponds to one of the MP's stipulated in Carlson (1978).
- 4) (21) is taken from Shibatani and Cotton (1977).
- 5) The precise formulation of (13) is given in Section 4.3.
- 6) In this paper, I regard, for convenience' sake, the semantic type corresponding to subordinate clauses simply as *t*. This simplification does not crucially affect my arguments in the paper.
- 7) Here,  $R'$  is another relation introduced in Carlson (1978). When *a* is an object of a kind *b*, that object is said to realize that kind, and this relationship is represented by the formula  $R'(a, b)$ .
- 8) This rule cannot deal with sentences such as :

- (i) Caesar wa Brutus ga korosita.  
'As for Caesar, Brutus killed him.'

To derive (i), we will need a rule of quantification like S14 in PTQ (Montague, 1973). Note here that *wa* in (i) has a contrastive connotation. On the other hand, no rule of quantification should be involved in the case of *ga*. The following sentence is ungrammatical :

- (ii) \* Caesar ga Brutus ga korosita.  
'It was Caesar that Brutus killed.'

As (ii) shows, the object NP cannot be 'subjectivized' with *ga*-marking. Furthermore, compare the following pair of sentences :

- (iii) a. John wa Mary ga suki-da.  
'John likes Mary,' or 'As for John, Mary likes him.'
- b. John ga Mary ga suki-da.  
'It is John who likes Mary.'

(iii-a) is ambiguous, but (iii-b) is not. (iii-b) cannot be interpreted as 'it is John that Mary likes', for the same reason that the object NP cannot be 'subjectivized'.

- 9) This rule, as it stands, needs to be modified so that sentences such as (21-a), (24-b), (25-b), and (26-b) should be blocked or be characterized as unnatural. In

Shibatani and Cotton (1977), they proposed the following condition imposed on the structure represented in (23-b) :

(i) (ibid., 275)

$S_1$  must express a general characteristic/feature attributable to  $NP_1$ .

As they observe, if those portions of sentences corresponding to  $S_1$ 's in (23-b) are regarded as expressing incidental or fleeting states, and are unlikely to qualify as general characteristics attributable to  $NP_1$ 's, then these sentences turn out to be unacceptable. For example, the phrase "siriai no gaizin ga sunde iru" in (26-b) is too specific to state some characteristic of Kobe, while the phrase "gaizin ga takusan sunde iru" in (27-b) can be regarded as a general statement about one of its characteristics. Hence (27-b) is far better than (26-b). In our framework sentences such as (13) and (14) are derived employing  $S_{10}$ , which creates new  $IV'$ -phrases designating sets of individuals. The condition proposed by Shibatani and Cotton can be re-interpreted as requiring the 'naturalness' of those sets created by  $S_{10}$ .

10) Here, " $his_n$ " is introduced syncategorematically. Alternatively, we can treat " $his_n$ " as a basic expression.

11) Here, "**Poss**'" is an abstract operator, and it does not exactly correspond to the particle *no*.

12) In these examples, the past tense is ignored for simplicity. I also ignore morphological subtleties for expository purposes.

13) The symbol " $=>$ " is used here for "translates into".

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