OUKA
The University of Osaka
Institutional Knowledge Archive

Title	Logical Properties of Japanese Kakari zyosi
Author(s)	Nishiguchi, Sumiyo
Citation	OUPEL(Osaka University Papers in English Linguistics). 2003, 7, p. 115-133
Version Type	VoR
URL	https://doi.org/10.18910/72930
rights	
Note	

The University of Osaka Institutional Knowledge Archive : OUKA

https://ir.library.osaka-u.ac.jp/

The University of Osaka

SUMIYO NISHIGUCHI

LOGICAL PROPERTIES OF JAPANESE *KAKARI ZYOSI*[*]

The existence of determiners in Japanese, a language that does not possess explicit determiners, has so far been argued mainly from a syntactic perspective. This study presents a semantic account of the existence of determiners in Japanese. I will show that 'quantifier-like operators' such as the particles *dake*, *sae*, and *mo* – first pointed out by Kuroda (1970) – have semantic types of determiners, functioning as quasi-generalized quantifiers together with CN. Many of them are nonmonotonic, like the English determiners *the* and the generic operator. Furthermore, I propose that Japanese NPs are of type <e,t> in general, and that the null operator accompanies bare NPs. Attempts are made to solve type-mismatches in LF, from a syntax-semantics interface viewpoint in the spirit of Heim and Kratzer (1998). Lastly, I briefly demonstrate that the polimorphism of particles accounts for major criticism toward determiner analysis.

1 DETERMINERS IN JAPANESE?

Unlike in Indo-European languages, explicit determiners, such as *a, an, the,* or *some* in English, do not exist in Japanese. Also, plurality and definiteness are not marked morphologically.

(1) Otoko-no hito-ga haitte-ki-ta.
male-GEN person-NOM enter-come-PAST
'A man came in'

In order to emphasize singularity, a numeral *hitori* (1-person) should be added to the noun *otoko* (man).

[*] I thank Seisaku Kawakami and Yukio Oba for giving me the opportunity to write this paper. I would like to express my heartfelt appreciation to Norihiro Ogata and Hiroshi Mito for their valuable comments while this paper was under development. I also thank Takao Gunji, who taught me type-shifting semantics, and offered practical advice regarding the formulas. Special thanks to Pauline Jacobson for precious suggestions on the earlier version of this paper, and to Taisuke Nishigauchi and Joseph Emonds for answering my questions relevant to the content. I also benefited a lot from discussion with my dear colleagues Eri Tanaka and Koji Kawahara. Thanks go to Paul A.S. Harvey and Antonio Otero for stylistic improvement.

S.Kawakami & Y.Oba (eds.) Osaka Univ. Papers in English Linguistics, 7, 2002, 115-133.

(2) 1-ri-no otoko-no hito-ga haitte - ki - ta.
1-CL-GEN male-GEN person-NOM enter-come-PAST
'One man entered.'

Although not equivalent to *the*, as a means to express definiteness, prenominal modifiers, expressed by *so*-series in Japanese, are added to serve for deictic use.[1]

(3) So-no otoko-no hito-ga haitte-ki-ta.
that-GEN male-GEN person-NOM enter-come-PAST
'That/the man entered.'

The absence of explicit determiners has raised questions both syntactic and semantic. In syntactic theories, the DP Hypothesis has been advocated in the works of Saito and Murasugi (1989) and Fukui (1995), where they have been "forced to assume that every language has D in some form or another" (Fukui 1995), without exception.[2] Fukui (1995) assumes that D should play a role in LF. On the other hand, among semanticians, whether Generalized Quantifier theory (Barwise and Cooper 1981) applies to a determiner free language like Japanese has become an issue (Shirai 1987, Ogata 1990).

In this article, first, I will show that the particles referred to by Japanese grammarians as *kakari zyosi,* that are *mo* (also), *dake/nomi* (only),[3] and *sae* (even), occupy the determiner position, by forming quasi-generalized quantifiers with CN. Next, I will consider bare NPs without determiners, and show that Japanese NPs are inherently of the predicate type, in which a determiner type null operator is attached to bare NPs.

2 SYNTACTIC EVIDENCE OF QUANTIFICATION

It is well known that Weak Crossover (WCO) effects serve as trace detectors for operators /quantifiers (Hornstein 1995).

(4) *His $_i$ mother gave everyone$_i$ a candy.

The ungrammaticality of (4) is explained by the following LF structure.

(5) [Everyone $_i$ [his$_i$ mother gave t_i a candy]]

---

[1] See Kuno (1973), Kinsui and Takubo (1992), and Hoji (2003).

[2] Although Fukui (1986, 1988) concludes that Japanese lacks D in terms of the lexicon, later, Fukui (1995) assumes that Japanese has D or something equivalent in terms of the function..

[3] As Numata (2000) points out, *dake* and *nomi* share almost the same meaning and function as focus particles. The obvious distinction is that the usage of *nomi* is restricted mostly to written Japanese, while *dake* is more commonly used in spoken language (Numata 2000:182).

The trace of the quantifier which is raised at LF cannot be bound by the pronoun within the domain of its operator.

Since Hoji (1985), WCO effects have been used to attest to quantification by Japanese quantifiers.[4] For example, phrases that contain *mo/nomi/sae* particles cannot bind *so-ko* as its variable in (6):

(6) a. *So-ko$_i$-no bengosi-ga Toyota$_i$-*nomi*-o uttaeta.
that-place-GEN lawer-NOM Toyota-only-ACC sued
'That place's lawyer sued only Toyota.'

b. *So-ko$_i$-no bengosi-ga Toyota$_i$-*mo* uttaeta.
that-place-GEN lawer-NOM Toyota-also sued
'That place's lawyer also sued Toyota.'

c. *So-ko$_i$-no bengosi-ga Toyota$_i$-*sae*-o uttaeta.
that-place-GEN lawer-NOM Toyota-even-ACC sued
'That place's lawyer sued even Toyota.'

Removing *mo/nomi/sae* improves grammaticality drastically:

(7) So-ko$_i$-no bengosi-ga Toyota$_i$-o uttaeta.
that-place-GEN lawer-NOM Toyota-ACC sued
'That place's lawyer sued only Toyota.'

It is also the case with *dake*:

(8) * [$_{TP}$ [So-itu$_j$ –no titioya-ga$_i$][$_{VP}$ t_i gakusei$_j$-*dake*-o kawaigatta]
that-guy-GEN father-NOM student-only-ACC loved
'His father loved only students'

So-itu (that-guy) cannot be coreferential with *gakusei* (student) as bound variables. Thus, WCO effects detect quantification with particles.

Next, I will consider the semantics of these particles. The above syntactic evidence leads us to consider that the semantic type of CN + particles are like generalized quantifiers.

3 QUASI-GENERALIZED QUANTIFIERS

Kuroda (1970) was the first to call *dake* (only), *sae* (even), and *mo* (also), 'quantifier-like particles.' Now, considering the syntactic evidence that these particles quantify over NPs, we can assign them the semantic type of determiners, <et,<et,t>>, taking a pair of arguments. In the following sections, first I will consider these particles' semantics in both subject and object positions. Then, I will draw attention to

[4] See Ueyama (1998), Hoji et al. (2000), and others.

their common feature, namely, nonmonotonicity.[5]

3.1. CN + Particles in the Subject Position

3.1.1 CN+Dake, Nomi as Determiner The lexical entries for *dake* and *nomi*, attached to CN, are the same as *only*:

(9) $[\![\text{dake}]\!] = [\![\text{nomi}]\!]$
$= \lambda f \in D_{<e,t>}. [\lambda g \in D_{<e,t>}.$ for all $x \in D_e$ such that $g(x)=1, f(x)=1]$

Since there is no semantic difference between *dake* and *nomi,* they share identical lexical entries.

Let us consider an example:

(10) Itinensei-*dake*-ga Taroo-o suki-da.
first-graders-only-NOM Taroo-ACC like-be
'Only first graders like Taroo.'

As the *dake* phrase is raised, index '1' is inserted. Therefore, the syntactic structure for (10) is:

---

[5] It should also be noted that focus sensitivity affects truth conditions. Since Jackendoff (1972), the terminology, "association with focus" has referred to the semantic effects of words such as *only*, *even*, and *also*.

(i) a. Taroo only speaks ENGLISH.
b. Taroo only SPEAKS English.

Suppose Taroo is a 'linguist', in the sense that he is multilingual – he is able to speak not only English but also French, German, Italian, Russian, Tagalog, etc. In such a case, (ia) would be false, while (ib) is true. In another model where he can both write and speak English, (ia) is true, but (ib) is false.

In Japanese, *dake*, *nomi,* which is correspondent in meaning with *only*, behaves in the same manner:

(ii) a. Taroo-wa Eigo-o HANASU-*dake*-da
Taroo- TOP English- ACC speak only be
' Taroo only SPEAKS English.'
b. Taroo-wa EIGO - o hanasu - *dake*-da
Taroo-TOP English-ACC speak only be
'Taroo only speaks ENGLISH.'

Similar to previous examples, (iia) is false if Taroo can both write and speak English, while it does not falsify (iib). On the other hand, when Taroo speaks not only English but also other languages, say, Russian, (iia) is still true, while (iib) is false.

Consequently, different LFs are involved with focus positions. The operator- variable relation of *dake* and x is respectively:

(iii) a. (only x: x is to speak) [Taro x English]
b. (only x: x is English) [Taro speaks x]

(11) [Itinensei-*dake*-ga 1 [t_1 Taroo-o suki-da]

The semantics for (11):

(12) $[\![$itinensei$]\!]^a = \lambda x \in D_e$. x is the first grader
$[\![$Taroo$]\!]^a$ =Taroo
$[\![$suki-da$]\!]^a = \lambda y \in D_e . [\lambda x \in D_e . x$ likes y]
$[\![$Taroo-o sukida$]\!]^a$
$= [\![$suki-da$]\!]^a ([\![$Taroo$]\!]^a) = \lambda x \in D_e . [x$ likes Taroo]
$[\![t_1$ Taroo-o suki-da$]\!]^{a^{x/1}}$ =a(1) likes Taroo
where
$1 = P \in D_t . [\lambda x \in D_e . P]$
where
$P = [\![$VP$]\!]^{a^{x/1}}$
$[\![t_1]\!]$ =x
$a^{x/1}(1)$=x
$[\![1 [t_1$ Taroo-o suki-da$]\!]^{a^{x/1}} = \lambda x \in D_e . a(1)$ likes Taroo
$[\![$itinensei-dake$]\!]^a = [\![$dake$]\!]^a ([\![$itinensei$]\!]^a)$
$[\![$itinensei-dake-ga 1 [t_1 Taroo-o suki-da$]\!]^{a^{x/1}}$
$= [\![$dake$]\!]^a ([\![$itinensei$]\!]^a) ([\![1 [t_1$ Taroo-o suki-da$]\!]^{a^{x/1}})$
=1
iff
for all x such that x likes Taroo, x is a first grader

To note, in accordance with the VP Internal Hypothesis, I assign type <t> to VP, instead of <e,t> that Heim and Kratzer (1998) pursues. Although treating VP as <t> requires an extra type shift as shown later, I believe this reflects present theory more accurately.

3.1.2 CN + Mo *Mo* is equivalent in meaning to *also*, or *too*. It is obvious that the truth value of *mo*-sentences depends on that of the sentence without *mo*. Iida (2001) sets the following axiom:

(13) $\models_s^C Q(\text{mo})\ \phi \Leftrightarrow \models_s^C Q\ \phi$ (Iida 2001:12)[6]

That is to say, (14a) entails (14b) and vice versa.

(14) a. Nihonzin-*mo* Edii Maahyii-o suki-da. <–>
Japanese-also Eddy Murphy-ACC like
'Japanese also like Eddy Murphy.'

[6] 'Q' stands for quantified expressions having index *k*, and φ is a formula which accommodates variable x_k. 'C' is the context. (Iida 2001:11)

b. Nihonzin-ga Edii Maayhii-o suki-da.
Japanese-NOM Eddy Murphy-ACC like-be
'Japanese like Eddy Murphy.'

(14a) is true if and only if Japanese like Eddy Murphy. When there are no Japanese who like him, it is false. Does that mean that *mo* does not have any interpretable denotation?

Intuitively, in the above examples, when there is no set of individuals who like Eddy Murphy other than Japanese, the utterance (14a) is not appropriate. Here arises the issue: is it just 'not appropriate' or 'false'? In other words, is "having no other set/member satisfying the predicate" the truth condition?

Iida introduces 'Tekisetu jouken (appropriateness condition)', which does not affect the truth conditions of the sentence. It is based on the fact that (15) is not falsified even if students other than Taroo were not scolded.

(15) Sensei-ga Taroo-*mo* sikatta.
teacher-NOM Taroo-also scolded
'The teacher also scolded Taroo.'

However, in view of the principle of compositionality, *mo* should have some distinguishing feature. Otherwise, *mo* does not contribute anything to the sentence semantically. It seems plausible to incorporate the meaning 'other than x also did so' as a presupposition. The lexical entry for *mo* in subject position like (14a) is:

(16) $[\![mo]\!]^a = \lambda f \in D_{<e,t>}. [\lambda g \in D_{<e,t>}.$ if there is some $h \in D_{<e,t>}$ such that $h \neq f$ and there is some $y \in D_e$ such that $h(y)=g(y)=1$ and $f(y)=0$, there is some $x \in D_e$ such that $f(x)=g(x)=1]$

In application,

(17) Nihonzin-*mo* Edii Maahyii-o suki-da
Japanese-also Eddy Murphy-ACC like
'Japanese also like Eddy Murphy.'

The syntactic structure of (17):

(18) $[_{TP}$ Nihonzin-*mo* 1 $[_{VP}\ t_1$ Edii Maahyii-o suki-da$]$

The semantics for (18):

(19) $[\![$nihonzin$]\!]^a = \lambda x \in D_e$. x is Japanese
$[\![$Edii Maahyii$]\!]^a$=Eddy Murphy
$[\![$Edii Maahyii-o suki-da$]\!]^a = \lambda x \in D_e$. x likes Eddy Murphy
$[\![$nihonzin-mo$]\!]^a$
$= [\![$mo$]\!]^a([\![$nihonzin$]\!]^a)$

= λg ∈ $D_{<e,t>}$. if there is some h ∈ $D_{<e,t>}$ such that h is not the set of Japanese and there is some y ∈ De such that y is Japanese and g(y)=1, there is some x ∈ D_e such that f(x)=g(x)=1]
[[Nihonzin-mo 1[t_1 Edii Maahyii-o suki-da]]] $^{a^{x/1}}$
= [[mo]] ^{a}([[nihonzin]] ^{a}) ([[1 [t_1 Edii Maahyii-o suki-da]]] $^{a^{x/1}}$)
= 1
iff
if there is some y such that y is not Japanese and y likes Eddy Murphy, there is some x such that x is Japanese and x likes Eddy Murphy.

3.1.3 CN+Sae *Sae*, like its English equivalence *even*, means 'unlikely' (cf. Rooth 1985). Consider the following *sae* sentence:

(20) Nihonzin-*sae* ER-ga suki-da.
Japanese-even ER-NOM like-be
'Even Japanese like *ER*.'

The syntactic structure for (20) is:

(21) [Nihonzin-*sae* 1[t_1 ER-ga suki-da.]]

The lexical input for *sae* is:

(22) [[sae]] =λf ∈ $D_{<e,t>}$.[λg ∈ $D_{<e,t>}$. for all x ∈ D_e such that f(x)=1, g(x)=1, and the fact that f(x)=g(x)=1 is unlikely]

The computation is similar to that used for *dake*, *nomi,* and *mo*.

3.2 Particles in the Object Position

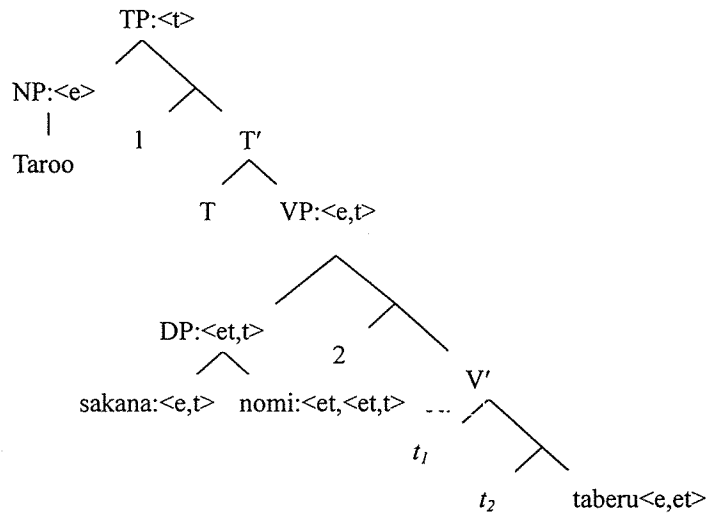
Next, let us consider the cases where particles are attached to object NPs.

(23) Taroo-wa sakana-*nomi*-o taberu.
Taroo-TOP fish-only-ACC eat
'Taroo eats only fish.'

The *nomi* phrase is VP adjoined, going through Quantifier Raising:
The syntactic tree for (23):

(24) a. [$_{TP}$ Taroo-wa 1 [$_{VP}$ sakana-*nomi*-o 2 [$_{VP}$ t_1 t_2 taberu]]]

b.



The semantics for (24):

(25) ⟦sakana⟧ ^{a}=λx∈D_e. x is fish
2(f(⟦t_1⟧ ^{a}))=λx∈ D_e. f(x)
where
f(x)= ⟦VP⟧ $^{a\ x/2}$
⟦t_2⟧ =x
$a^{x/2}$(2)=x
⟦t_1 t_2 taberu⟧ ^{a}= a(1) eats a(2)
⟦2 [t_1 t_2 taberu]⟧ ^{a}=λx ∈ D_e . a(1) eats x
⟦sakana-nomi⟧ ^{a}=λg ∈ $D_{<e,t>}$. for all x ∈ D_e such that x is a fish, g(x) = 1
⟦sakana-nomi 2 [t_1 t_2 taberu]⟧ ^{a}
=for all x ∈ D_e such that a(1) eats, x is a fish
⟦1 [sakana-nomi 2 [t_1 t_2 taberu]⟧ $^{a\ z/1}$
=λz ∈ D_e . for all x ∈ D_e such that a(1) eats, x is a fish
⟦Taroo-wa 1 [sakana-nomi 2 [t_1 t_2 taberu]⟧ ^{a}=1 iff
for all x ∈ D_e such that Taroo eats, x is a fish

The type of *nomi* is <et,<et,t>>, on par with the English determiner *the,* and the same as quantifiers *many, some*, and others.

To note, this tree straightforwardly reflects the VP-Internal Subjects Hypothesis by assigning type <t> to VP, not <e,t> . Heim and Kratzer (1998) pursues another option, assigning type <e,t> for VP. However, even though it requires additional type shifting i.e., insertion of the variable binder '1,' to the one for QR of particle-phrases, it is

more plausible to assign <t> to VP which has the subject internally. The result appears to be a little more complicated than the <e,t> analysis. But, in light of the supporting evidence for VP internal subjects, the present analysis seems more appropriate.

3.3 Bare NPs with Null Operator

In the previous section we considered when particles occupy the determiner-position, thus, indicating that Japanese is not a determiner-free language. In this section, we will consider the semantic types of bare NPs without these particles. Instead, I suggest the existence of the null operators in determiner position which take bare NPs as the argument.

Regarding English NPs, Heim and Kratzer (1998) treats common nouns as denoting functions from individuals to truth-values.[7]

(26) $[\![\text{dog}]\!] = \lambda x \in D_e.\ x \text{ is a dog}$

Under the unified analysis, Japanese *inu* (dog) is:

(27) $[\![\text{inu}]\!] = \lambda x \in D_e.\ x \text{ is a dog}$

With stage-level predicate *oyogu* (swim):

(28) Inu-ga oyogu.
dog(s)-NOM swim
'A dog swims / Dogs swim.'

The subject DP *inu* (dog) should be either <e> or <et,t>, as the predicate *oyogu* (swim) is a one-place holder. Ascribing the noun *inu* as type <e,t> necessitates the phonetically empty D of type <et,<et,t>>:

(29) $[\![\varepsilon]\!]^a = \lambda f \in D_{<e,t>}.\ [\lambda g \in D_{<e,t>}.$ there is some $x \in D_e$ such that $f(x) = g(x) = 1]$

The syntactic structure for (29) is:

(30) $[_{TP}$ Inu-ga $1[_{VP}\ t_1$ oyogu$]]$

The semantics is:

(31) $[\![\text{oyogu}]\!]^a = \lambda x \in D_e.$ x swims

---

[7] Partee (1986) assigns bare plural NPs in predicate positions type <e,t>.

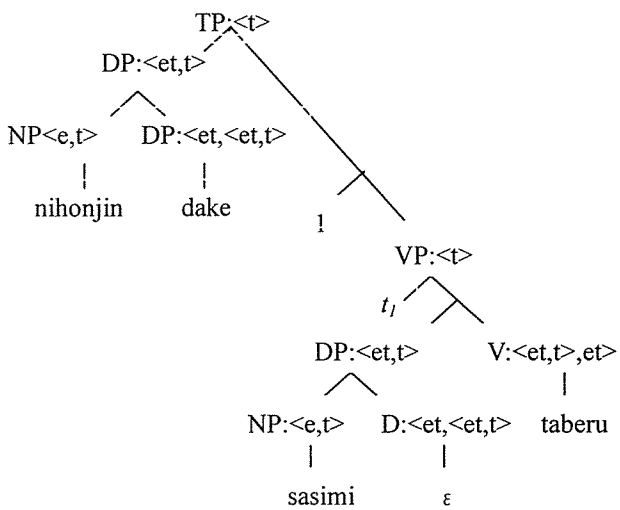
$[\![t_1$ oyogu$]\!]^{a^{x/1}}$=a(1) swims
$[\![\varepsilon]\!]^{a}([\![inu]\!])^{a}$
$=\lambda g \in D_{<e,t>}$. there is some $x \in D_e$ such that x is a dog and g(x)=1
$[\![1[t_1$ oyogu$]]\!]^{a^{x/1}}=\lambda x \in D_e$. a(1) swims
$[\![\varepsilon]\!]^{a}([\![inu]\!])^{a}([\![1[t_1$ oyogu$]]\!]^{a^{x/1}})$
=there is some x such that x is a dog and x swims

Next, let us apply this to object NP:

(32) Nihonzin-*dake*-ga sasimi -o taberu.
Japanese-only-NOM raw fish-ACC eat
'Only Japanese eat raw fish.'

The syntactic tree of (32) is,

(33) a. $[_{TP}\,[_{DP}$ Nihonzin *dake*-ga] $[_{TP}\,[_{VP}\,t_1$ sasimi –o taberu]
b.



The semantics for (33) is, where 'a' is a variable assignment,

(34) $[\![$Nihonzin$]\!]^{a}=\lambda x \in D_e$. x is Japanese
$[\![$sasimi$]\!]^{a}=\lambda x \in D_e$. x is raw fish
$[\![$taberu$]\!]^{a}=\lambda F \in D_{<et,t>}.[\lambda x \in D_e$ .x eats F]
$\mathbf{1}=\lambda P \in D_t.[\,\lambda x \in D_e$. $P\,]$
where
$P=[\![$VP$]\!]^{a^{x/1}}=[\![$TP$]\!]^{a^{x/1}}$
$[\![t_1]\!]=x$
$a^{x/1}(1)=x$
$[\![$sasimi-o taberu$]\!]^{a}=\lambda x \in D_e$. x eats raw fish
$[\![t_1$ sasimi-o taberu$]]\!]^{a}$=a(1) eats raw fish
$[\![1[t_1$ sasimi-o taberu$]]\!]^{a}=\lambda x \in D_e$ .x eats raw fish

$[\![$nihonzin-dake$]\!]^{a}$
$= [\![$dake$]\!]^{a}$ ($[\![$nihonzin$]\!]^{a}$)
$= \lambda g \in D_{<e,t>}$. for all x such that g(x)=1, x is Japanese
$[\![$[nihonzin-dake 1 [t_1 sasimi-o taberu]]$]\!]^{a}$
$= [\![$nihonzin-dake$]\!]^{a}$ ($\lambda x \in D_e$. $[\![t_1$ sasimi-o taberu$]\!]^{a^{x/1}}$)
$= [\![$dake$]\!]^{a}$ ($[\![$nihonzin$]\!]^{a}$)($\lambda x \in D_e$. x eats raw fish)=1
iff
for all x such that x eats raw fish, x is Japanese

Thus, we have successfully and uniformly dealt with Japanese NPs as DPs. In the following part, I will investigate the logical properties of these determiners. I will argue that there exists a common feature which they share with some English determiners.

4 NONMONOTONICITY

In this section I will abstract the common semantic feature of Japanese determiners, that is, nonmonotonicity. In Nishiguchi (2003a,b), I pointed out that English *the* and generic operator, along with *exactly n*[8] and others, share nonmonotonicity.

The: ↕↕MON↑

(35) a. The man came in. ←/→
b. The young man came in.
(36) a. The man came in slowly. →
b. The man came in.

Exactly n: ↕↕MON↕↕

(37) a. Exactly five men walk. ←/→
b. Exactly five young men walk.
(38) a. Exactly five children ate vegetables for breakfast. ←/→
b. Exactly five children ate kale for breakfast.

Dake/nomi is both right and left nonmonotonic:

[8] 'n' stands for numerals.

Dake/nomi: ↕↕MON↕↕[9]

(39) a. Handai-no gakusei-*dake*-ga bikkurisita. ←/→
Osaka University-GEN student-only-NOM was:surprised
'Only students of Osaka University were surprised.'
b. Taroo-*dake*-ga bikkurisita.
Taroo-only-NOM was:surprised
'Only Taroo was surprised.'

(40) a. Taroo-*dake*-ga hasitta. ←/→
Taroo-only-NOM ran
'Only Taroo ran.'
b. Taroo-*dake*-ga yukkuri hasitta.
Taroo-only-NOM slowly ran
'Only Taroo ran slowly'

Sae: ↑MON↑

(41) a. Taroo-*sae* bikkurisita. →
Taroo-even was:surprised.
'Even Taroo was surprised.'
b. Handai-no gakusei-*sae* bikkurisita.
Osaka University-GEN student-even were:surprised
'Even Osaka University students were surprised.'

(42) a. Taroo-*sae* totemo bikkurisita. →
Taroo-even very:much was:surprised
'Even Taroo was very much surprised.'
b. Taroo-*sae* bikkurisita.
Taroo-even was:surprised
'Even Taroo was surprised.'

Mo: ↑MON↑

(43) a. Taroo-*mo* bikkurisita. →
Taroo-also was:surprised.
'Taroo was also surprised.'
b. Handai-no gakusei-*mo* bikkurisita.
Osaka University-GEN student-even was:surprised
'The Osaka University students were also surprised.'

(44) a. Taroo-mo totemo bikkurisita. →
Taroo-also very:much was:surprised
'Even Taroo was very much surprised.'

---

[9] Conventionally, monotonicity in the first argument is called left monotonicity, and the one in the second argument is right monotonicity. Upward monotonicity in the first argument is described as ↑MON, downward monotonicity in the second argument is MON↓ (Barwise and Cooper 1981). In this paper, I use ↕↕MON / MON↕↕ to represent left / right nonmonotonicity respectively.

[10] The symbol '←/→' represents invalidity in either upward or downward entailment.

b. Taroo-mo bikkurisita.
Taroo-also was:surprised
'Even Taroo was surprised.'

Mo, when meaning *even*:

Mo: ↑MON↑

(45) a. Taroo-*mo* bikkurisita. →
Taroo-even was:surprised.
'Even Taroo was surprised.'
b. Handai-no gakusei-*mo* bikkurisita.
Osaka University-GEN student-even was:surprised
'Even Osaka University students were surprised.'

(46) a. Taroo-*mo* totemo bikkurisita. →
Taroo-even very:much was:surprised
'Even Taroo was very much surprised.'
b. Taroo-*mo* bikkurisita.
Taroo-even was:surprised
'Even Taroo was surprised.'

Generic operator: ↕↕MON↑

(47) a. Dogs have four legs. ←/→
b. Dogs that have been in accidents involving chain saws have four legs. (Heim 1984:103)

(48) a. Dogs have four legs. →
b. Dogs have legs.

What makes generics different from universal quantifiers is that they are not falsified by minor invalid cases: (47a) is not falsified by the occasional invalid dog that has lost one or more of its legs (Heim 1984). So (47a) fails to entail (47b) downward, and neither does (47b) upwardly entail (47a). This left monotonicity holds for Japanese generic NPs, too:

(49) a. Nihonzin-ga sasimi-o taberu-(koto) ←/→
Japanese-NOM sasimi-ACC eat-(fact) [11]
'Japanese eat raw fish'
b. Sakana-arerugii-no nihonzin-ga sasimi-o taberu-(koto)
fish-allergy-GEN Japanese-NOM raw:fish-ACC eat-(fact)
'Fish-allergic Japanese eat raw fish"

[11] I add *koto* 'the fact that' at the end of these sentences in order to avoid the unnaturalness resulting from the lack of a topic.

Wa: ↓MON↑

(50) a. Gakusei-*wa* benkyou-suru. →
students-TOP study do
'Students study.'
b. MSU-no gakusei-*wa* benkyou-suru.
MSU-GEN students-TOP study.
'MSU students study.'

(51) a. Taroo-*wa* tenisu-o suru. →
Taroo-TOP tennis-ACC do
'Taroo plays tennis.'
b. Taroo-*wa* supootu-o suru.
Taroo-TOP sports-ACC do
'Taroo plays sports.'

Thus, nonmonotonicity marks *dake, nomi* and generic operator. It is an interesting fact that English determiners *the*, and *exactly n* also share the same property. At present, I would just like to point out that this is a cross-linguistic phenomena, and that more should be discussed in the future.

5 CONSERVATIVITY

Although some of the Japanese *kakari zyosi* share the same logical property with English determiners, they unfortunately do not preserve conservativity, which is a common feature of determiners according to Barwise and Cooper (1981). It has also been argued that *only* fails the conservativity test (Gamut 1991, Herburger 2000, etc.)

(52) Conservativity
[D A]B iff [D A]A∩ B
(Herburger 2000:89)

(53) a. All women sneeze. ←→
b. All women are women who sneeze.

(54) a. Only women sneeze. ←/→
b. Only women are women who sneeze.

Shirai (1987) shows that subject NPs marked with the particle *wa* and *ga* do not maintain conservativity.

(55) a. Tori-*dake*-ga tobu. ←/→
bird-only-NOM fly.
'Only birds fly.'
b. Tori-*dake*-ga sora-o tobu tori-da
Bird-only-NOM sky-ACC fly bird-be
'Only birds are birds that fly.'

(56) a. Tori-*sae*-ga tobu. ←/→
bird-even-NOM fly
'Even birds fly.'
b. Tori-*sae*-ga tobu tori-da.
bird-even-NOM fly bird-be
'Even birds are birds that fly.'

Gamut (1991) classifies *only,* not as a determiner, but as a predicate modifier of category NP/NP, because *only* does not meet the conservativity test. It is obvious that *nihonjin-dake* does not live on ⟦nihonzin⟧ , therefore, they do not preserve conservativity, either.

6 POLIMORPHISM

Besides non-conservativity, another challenge to classifying *kakari zyosi* as determiners lies in the fact that they attach to quantified NPs which casts severe doubts as to whether they should be categorized as quantifiers (Brockett 1994, Iida 2001). However, I will argue that the cross-categorial status of *kakari zyosi* does not interfere with their determiner-status.

Iida (2001) argues that *dake* cannot be a determiner, since it attaches to another quantifier:

(57) 3-nin-no seito-*dake*-ga syukudai-o sita.
3-CL-GEN student-only-NOM homework-ACC did
'Only three students did homework.'

The quantifier/determiner position cannot be occupied with two canditates therefore, *dake* should not be a quantifier. Also, Brockett (1994) opposes classification of *mo* as determiner-like quantifier, and argues that it is an association-with-clausal particle.

Surely, those particles can attach to names, infinitive verbs, VPs, postpositional phrases or negative predicates:

CN+*dake*<et,<et,t>>

(58) Osaka-zin-*dake*-ga Okonomiyaki-o tukuru.
Osaka-people-only-NOM Japanese-pizza-ACC make
'Only Osaka people make Japanese pizza.'

Name+*dake*<e,<et,t>>

(59) Taroo-*dake*-ga Okonomiyaki-o tukuru.
Taroo-only-NOM Japanese-pizza-ACC make
'Only Taroo makes Japaneses pizza.'

Infinitive Verb+*nomi*<et, et>[12]

(60) Kare-ni dekiru-koto-wa matu-*nomi*-da.
he-DAT able-thing-TOP wait-only-be
'The only thing he can do is to wait.'

VP+*dake*<et,et>

(61) Taroo-wa tumazuita-*dake*-da
Taroo-TOP stumbled-only-be
'Taroo only stumbled.'

PP+*dake*<<e,et>,<e,et>>

(62) Himitu-o Taroo-ni-*dake* utiaketa.
secret-ACC Taroo-DAT-only revealed
'(someone) revealed the secret only to Taroo.'
(63) Taroo-wa Makudonarudo-de-*dake* taberu.
Taroo-TOP McDonald's-LOC-only eat
'Taroo eats only at McDonald's.

Negative Predicate+*dake* <et,et>

(64) Kanozyo-wa kodomo-o kawaigara-nai-*dake*-da
she-TOP child(ren) take:good:care:of-NEG-only-be
'She only does not take good care of (her) child(ren).'

In this regard, these particles share commonality with connectives such as *and* and *or* in their multi syntactic categories.

Nevertheless, the fact that these particles are non-monophormic cannot falsify their determiner status when they accompany NPs. These particles in other forms should be analyzed as of a different syntactic category and semantic type.

---

[12] Kato (1985) indicates that, unlike other focus particles, *dake* cannot attach to the verbal stem, but only after infl.

(i) a. Taroo wa gikyoku o kaki - *dake* –sita
drama write only did
'Taroo wrote only dramas.'
b. Taroo ga gikyoku o kai - ta *dake* da
write past only
'Taroo only wrote dramas.'

(Kato 1985:96)

7 CONCLUSION

In this article, I have analyzed the logical properties of *kakari*-particles as quasi-generalized quantifiers. This suggests that Japanese language is also equipped with determiners, which are particles or null operators. Also, polimorphism and nonmonotonicity characterize *kakari zyosi,* and it is noteworthy that English determiners also exhibit the former feature. In addition, it was demonstrated that type-shifting trees can accommodate all these, reflecting VP Internal Hypothesis more precisely.

REEFERENCES

Barwise, Jon and Robin Cooper (1981) "Generalized Quantifiers and Natural Language," *Linguistics and Philosophy* 4: 159-219.

Brockett, Chris (1994) "Mo: Quantificational Evidence for a Non-Quantificational Analysis," *MITWPL* 24, 25-59, Formal Approaches to Japanese Linguistics 1.

Carlson, Gregory N. (1977) *Reference to Kinds in English,* Ph.D. dissertation, University of Massachusetts. [Distributed by Garland Publishing, 1980, NY, London]

Chierchia, Gennaro (1998) "Reference to Kinds across Languages," *Natural Language Semantics* 6, 339-405.

Fukui, Naoki (1986) *A Theory of Category Projection and Its Applications*, Ph.D dissertation, MIT.

Fukui, Naoki (1995) "The Principles-and Parameters Approach: A Comparative Syntax of English and Japanese," in Masayoshi Shibatani and Theodora Bynon (eds.), *Approaches to Language Typology,* 327-372, Clarendon Press, Oxford.

Gamut, L. T. F. (1991) *Logic, Language and Meaning Vol. 2,* The University of Chicago Press, Chicago and London.

Heim, Irene (1984) "A Note on Negative Polarity and Downward Entailingness," *NELS* 14, 98-107

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

Herburger, Elena (2000) *What Counts: Focus and Quantification,* MIT Press, Cambridge, Mass.

Hoji, Hajime (1985) *Logical Form Constraints and Configurational Structures in Japanese,* Ph.D dissertation, University of Washington.

Hoji, Hajime (2003) "Falsifiability and Repeatability in Generative Grammar: A Case Study of Anaphora and Scope Dependency in Japanese," *Lingua* 113, 377-446.

Hoji, Hajime, Satoshi Kinsui, Yukinori Takubo and Ayumi Ueyama (2000) "Demonstratives, Bound Variables, and Reconstruction Effects," *Proceedings of the Nanzan GLOW: The Second GLOW Meeting in Asia*, 141-158.

Horn, Laurence R. (1969) "A Presuppositional Analysis of *Only* and *Even,*" *CLS* 5, 98-107.

Hornstein, Norbert (1995) *Logical Form*: *From GB to Minimalism,* Blackwell

Publishers, Cambridge, Mass.
Iida, Takashi (2001) *Focus and Negation:* An Essay in Japanese *Formal Semantics (3)* (in Japanese), Keio University, Tokyo. Available at <http://phil.flet.keio.ac.jp/person/iida/>
Jackendoff, Ray (1972) *Semantic Interpretation in Generative Grammar,* MIT Press, Cambridge, Mass.
Kato, Yasuhiko (1985) "Negative Sentences in Japanese," *Sophia Linguistica* 19, Sophia University, Tokyo.
Kinsui, Satoshi and Yukinori Takubo (eds.) (1992) *Sizisi* (Demonstratives) (in Japanese), Hituzi Syobo, Tokyo.
Kuno, Susumu (1998) "Dake, Sika Kobun-no Imi-to Kozo (The meaning and structure of dake, sika constructions)," Yukiko Sasaki Alam, *Gegogaku-to Nihongo Kyoiku* (Linguistics and Japanese Language Education), 291-320, Kurosio, Tokyo.
Kuroda, S.-Y. (1970) "Remarks on the Notion of Subject with Reference to Words Like *also, even, and only*," Part II. Annual Bulletin, Research Institute of Logopedics and Phoniatrics, University of Tokyo, 4, 127-152. [Reprinted in Kuroda, S.-Y. (1992) *Japanese Syntax and Semantics*, Kluwer Academic Publishers, Dordrecht]
Ladusaw, William A. (1980) "On the Notion *Affective* in the Analysis of Negative-Polarity Items," *Journal of Linguistic Research* 1, No.2, 1-16.
Nishiguchi, Sumiyo (2003a) "Non-monotonic Negativity," M.A. thesis, Osaka University, unpublished.
Nishiguchi, Sumiyo (2003b) "Non-monotonic Negativity," *The Proceedings of the 17th Pacific Asia Conference on Language, Information and Computation (PACLIC 17).*
Numata, Yoshiko (2000) "*Toritate,*" *Toki, Hitei to Toritate,* Iwanami Shoten, Tokyo.
Numata, Yoshiko (2001) "Toritate-no Sayoiki-to Hitei," *Nihongo-no Toritate,* Tsukuba University.
Numata, Yoshiko and Kenbin Jo (1995) "Toritate-shi *Mo*-no Focus- to Scope," *Nihongo-no Syudai-to Toritate*, eds. Takashi Masuoka et al., Kuroshio, Tokyo.
Ogata, Norihiro (1990) "Japanese Particles and Generalized Quantifiers," *Proceedings of the 4th Summer Conference 1990 Tokyo Linguistics Forum.*
Partee, Barbara (1986) "Noun Phrase Interpretation and Type-Shifting Principles," Jeroen Groenendijk et al. (eds), *Studies in Discourse Representation Theory and the Theory of Generalized Quantifiers,* 115-143, Foris Publications, Dordrecht.
Rooth, Mats Edward (1986) *Association with Focus,* Ph.D dissertation, University of Massachusetts. [Reproduced and distributed by GSLA, 2002]
Saito, Mamoru and Hajime Hoji (1983) "Weak Crossover and Move α in Japanese," *Natural Language and Linguistic Theory* 1, 245-259.
Saito, Mamoru and K. Murasugi (1989) "N'-Deletion in Japanese," *UConn Working Papers in Linguistics*, University of Conneticut.
Shirai, Kin-ichiro (1987) "Japanese Noun-phrases and Particles *wa* and *ga*," *Foundations of Pragmatics and Lexical Semantics,* eds. Jeroen Groenendijk et al., 63-80, Foris Publications, Dordrecht.

Ueyama, Ayumi (1998) *Two Types of Dependency*, Ph.D dissertation, University of Southern California. [Distributed by GSIL Publications, USC, Los Angeles]

Sumiyo Nishiguchi
sue_westgate@nifty.com