REFERENCE TO EVENTS IN NOUN PHRASES

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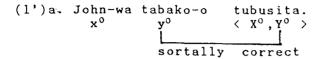
0.   In making a sortal distinction in the domain of entities
it is required, explicitly or implicitly, that

(0)a. predicates are basically defined according to what sort of
      entities their arguments denote, and that

   b. sort-types of predicates coincide with those of their
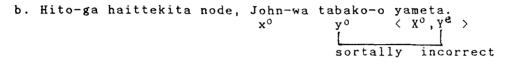   arguments.

However, in some cases, while sort-types of predicates are
different   from   those   of   their   arguments,   nevertheless   the
resulting   sentences   are   adequate. Consider   the   following
examples:

(1)a. John-wa <u>tabako</u>-o   tubusita.
              cigarette   stub-out
      (John stubbed a cigarette out)

   b. Hito-ga haittekita node, John-wa <u>tabako</u>-o   yameta.
      someone come-in   since   cigarette stop
      (Since someone came in, John stopped smoking)

(2)a. Kono <u>suika</u>-wa   amai.
      this watermelon   taste-sweet)
      (This watermelon tastes sweet)

   b. Konna mahuyu-ni <u>suika</u>(to)-wa mezurasii.
      Such   winter   watermelon   unusual
      (In such a winter watermelons are unusual)

The terms <u>suika</u>(watermelon) and <u>tabako</u>(cigarette) denote objects
(We will henceforth use 'objects' to refer to things which are
most readily thought of as constituting entities, e.g., things
like John, the earth or the car I drove today). On the other
hand, the predicates <u>amai</u>(taste sweet) and <u>tubusu</u>(stub out)
require arguments denoting objects in object position. Therefore,
there is no problem in (la) and (2a), for there is no sortal
discrepancy between predicates and arguments(i.e., both sorts are
objects). However, in (lb) and (2b) we encounter a difficulty. In
(lb) it is not an object that John stopped. Clearly, (lb) means
that John stopped some action. In (2b) it is a state of affairs
that is unusual. The speaker cannot use (2b) to say that this
object is unusual, or this kind of objects is rare, pointing at
a watermelon in front of him. Actually, (2b) is used to say that
it is unusual that in such a severe winter watermelons are
served, or they are sold. Complexities here come from the fact
that the predicate <u>yameru</u> (stop) and <u>mezurasii</u>(be usual) require

arguments denoting events in object position, whereas their arguments are the terms denoting objects. From a sortal agreement, (1b) and (2b) must be filtered out. Nevertheless, (1b) and (2b) are acceptable. (For the reason of taking mezurasii(be unusual) as an event-predicate, see note 1.)

This is demonstrated as follows:

(1')a. John-wa tabako-o   tubusita.
         x^0 y^0 $\langle X^0, Y^0 \rangle$
              |_____|
              sortally   correct

b. Hito-ga haittekita node, John-wa tabako-o yameta.
                           x^0 y^0 $\langle X^0, Y^e \rangle$
                                |_____|
                                sortally   incorrect

, where X^0 and Y^0 are object-sorted variables and Y^e is an event-sorted variable. (2) is demonstrated in a similar way as in (1'a,b).

A similar kind of sortal discrepancy is seen in the following examples, which contain prepositional phrases in NPs:

(3)a. John-wa dokusya kara no tegami-o yabutta.
             reader from of letter   tear
      (John tore letters from his readers)

   b. John-wa dokusya kara no tegami-o tetudatta.
             reader from of letter   help
      (Lit. John helped (someone with) letters from his readers)

   c. John-wa dokusya kara no tegami-o sirasareta.
             reader from of letter   be--informed
      (John was informed of letters from his readers)

The NP dokusya kara no tegami(letters from his readers) denotes objects. The predicate yaburu(tear) in (3a) takes terms denoting objects in object position. Tetudau(help) in (3b) takes terms denoting events in object position if they are non--animate. Because it is unnatural for letters(i.e., objects) to require John's help. Sirasareru(be-informed) in (3c) takes terms denoting events in object position. John must be informed of something 'informative' about letters. (3b) and (3c) are acceptable in spite of a sortal discrepancy as are (1b) and (2b). (We will demonstrate later that these NPs in (3a-c) have different structures respectively.)

One way of solving a sortal discrepancy has been proposed by Carlson(1978). In order to resolve a sortal discrepancy between predicates and arguments, he introduced a few operators. For example, he assumes that the predicate intelligent basically applies to objects and the bare plural NPs dogs to a kind. Therefore, in sentences like (4) sortal discrepancies occur.

(4) Dogs are intelligent.

In order to resolve this discrepancy, he uses the operator Gn. It elevates _intelligent_ to a predicate that applies basically to a kind. As a result, a sortal discrepancy in (4) disappears. Should we also invent another new operator to make a sort-type of a predicate coincide with that of an argument in order to resolve discrepancies in (1b) and (2b)? Suppose that this operator is Q, which elevates _yameru_(stop) to a predicate that applies to objects, or suppose that this operator is Q', which changes the object-sorted NPs(e.g., _tabako_) into event-sorted NPs. Then, a sortal discrepancy would be resolved by virtue of Q or Q'. However, there seems to be no justification for such an analysis. The task of these operators would simply be to make a change of one sort into another. Furthermore, there seems to be no seman-tically connected relation between objects and events such as Carlson's R(R').

One might think that the examples mentioned above are similar to 'unagi-bun' in Japanese(e.g., _Boku wa unagi da._). However, there is a decisive difference between the examples here and 'unagi-bun', for there exists no sortal discrepancy in 'unagi-bun'.

This paper purports to examine examples with sortal discrepancies and provide a model-theoretic treatment of them. Sections 1-1 to 1-4 treat examples represented by (1) and (2). Section 1-1 presents two fundamental observations. In Section 1-2, we will provide a way to deal with object-sorted terms used to represent events. Section 1-3 introduces a sort of nominaliza-tion. Section 1-4 shows how a sortal discrepancy is resolved, and also presents translations of NPs in such a discrepancy. Section 2-1 treats example (3).

1-1.   We used 'objects' to refer to things like John or the car I drived today, which are most readily thought of as constituting entities. Apart from expressions representing these 'objects', there are expressions in natural languages which represent actions, activities, processes or the like. We will henceforth use 'events' to refer these spacial-temporal matters. It is not determined a priori whether or not an event is sortally distinguishable as an independent entity in the domain of entities. Montague proposed that generic(instantaneous) events be analyzed as properties of moments of time. I prefer to take a different position and regard events as independent entities, or individuals.

Then, NPs are classified into three sub-types as follows:

(5)a. terms denoting objects ----- John, suika(watermelon)
   b. terms denoting events ----- unten(driving)
   c. terms denoting both objects and events ----- ryoori(dishes
                      or cooking), ame(raindrop or rain)

Ryoori and _ame_ in the case (5c) denote both objects and events. Which sort-type they belong to depends on the kind of predicates. (6) illustrates this:

(6)a. _Mary-no ryoori_-wa oisii.
            dishes   delicious

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            (Lit. Mary's dishes are delicious)

     b. Mary-no ryoori-wa tegiwa-ga yoi.
                cooking    be-speedy
        (Lit. Mary's cooking is speedy)
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Mary no ryoori denotes an object in (6a), and an event in (6b).
     Predicates are subcategorized according to what sort-type
their arguments denote. For example, two-place predicates have
four combinations of sort-types as in (7):

```
(7)a. P(o,o)    John wa Bill o nagutta.(John hit Bill)
   b. P(o,e)    John wa arasi o kowagaru.(John dreads a storm)
   c. P(e,o)    Arasi wa ieie o kowasita.(The storm broke houses)
   d. P(e,e)    Kaze wa arasi o yobu.(A wind causes a storm)
```

, where o and e represent object-(or event-) sorted arguments.
Naguru(hit) in (7a) takes exclusively an argument denoting an
object in subject position, whereas sukida(like) takes an
argument denoting an object or that denoting an event in object
position.
     Then, possible combinations of sort-types between predi-
cates and arguments are demonstrated as follows:

```
(8) A predicate requires an argument denoting objects.
    (i)  Its argument denotes objects. (1a,2a)
    (ii) Its argument denotes events. (* Unten-ga hasitta)

(9) A predicate requires an argument denoting events.
    (i)  Its argument denotes objects. (1b,2b)
    (ii) Its argument denotes events. (Unten-wa kantanda)
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Case (8ii) is not observed, at least in Japanese. (8i) and
(9i) correspond to (1a,2a) and (1b,2b) respectively. In this
paper, we will concentrate upon cases (8i) and (9i). As for
certain problems concerning case (9ii), we will discuss them
elsewhere.[2]

1-2.   Let us now examine examples in more detail. So far we
have observed that some NPs denoting objects are used to denote
events. Let us repeat the examples mentioned earlier:

```
(10)a. Konna mafuyu ni suika(to)-wa mezurasii. (= 2b)
       such  winter     watermelon    unusual
       (In such a winter watermelons are unusual)

   b. Konna  basho ni konna hinsyu no mono-wa kangaerarenai.
      such   place    such  variety   thing   unconceivable
      (In such a place such a variety is unconceivable)

(11)a. Kono suika-wa    amai. (= 2a)
       this watermelon taste-sweet
       (This watermelon tastes sweet)

   b. Konna hinsyu no mono-wa koko-ni sika nai.
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such    variety    thing    here    only not
(Lit. Such a variety is seen only here)
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Interpretation of (10a)(=2b) varies in terms of the context of
use. In (10a) what is unusual might be an event that watermelons
were served, or an event that they were sold in a severe winter.
Similarly, in (10b) what is unbelievable might be a fact that
something is growing, or a fact that something is sold in an
unexpected place. Therefore, in order to determine truth values
of (10a,b) we must know which events are denoted. Then, it is
neccesary to get the contextual information about events repre-
sented by using object-sorted NPs as well as values of the
indexical expressions. On the other hand, (11a,b) need only to
determine values of the indexical expressions.
        The same applies to (12) and (13):

(12)a. John-wa <u>keiki</u>-o tetudatta.
             cake   help
       (Lit.John helped (someone bake, etc,) cake)

    b. Syunin-wa <u>John</u>-o sibutteiru rasii.
       boss   hesitate   look
       (Lit. The boss looks hesitating (to employ, etc,) John)

(13)a. John-wa <u>Mary</u>-o tetudatta.
                        help
       (John helped Mary)

    b. Syunin-wa <u>John</u>-o sikatta.
       boss   reproach
       (The boss reproached John)

Each of (13a,b) has a unique interpretation. On the other hand,
interpretations of (12a,b) vary, depending on the context of use.
In (12a) John might have helped to bake a cake, or he might have
helped to carry cakes, etc. In (12b) what the boss is worried
about is 'something' about John. The boss might have not wanted
John to go to Tokyo on business, or he might have been unwilling
to employ John. In (12a) and (12b), we cannot uniquely determine
which events are denoted.
        In some cases, however, the denotations of object-sorted
NPs used to denote events are determined comparatively uniquely.
Examples (14a-c) illustrate this. In examples like (14) which
events are denoted is, so to speak, conventionally determined. On
the other hand, in (15a) denotations(i.e., objects in these
cases) are determined straightforwardly.

(14)a. <u>Otoko</u>-wa turai.
       men   experience-hardship
       (Men experience hardship)

    b. Hito-ga haittekita node, John-wa <u>tabako</u>-o yameta. (= 1b)
       someone come-in   cigarette stop
       (Since someone came in, John stopped smoking)

c. Kare no <u>hootyoo</u>-wa saeteita.
   his   knife   be-skillful
   (Lit. His knife is skillful)

(15)a. <u>Otoko</u>-wa sensaida.
       men   sensitive
       (Men are sensitive)

   b. John-wa <u>tabako</u>-o tubusita.
              cigarette rub-out
      (John rubbed a cigarette out)

   c. Kare-no <u>hootyoo</u>-wa yoku kireta.
      his   knife   well be-sharp
      (His knife was sharp)

(14a-c) could be paraphrased in terms of conventional contents
only roughly such as (16a-c):

(16)a. <u>Otoko-de aru(or iru) koto</u>-wa turai.
       (Men experience hardship)

   b. <u>John-wa tabako-o suu no</u>-o yameta.
      (John stopped smoking)

   c. <u>Kare no hootyoo sabaki</u>-wa saeteita.
      (Lit. His doing something with a knife is skillful)

However, it should be emphasized that it is a question of
degree whether a sentence can be paraphrased conventionally or
not. In the result, it follows that whether conventionally or
not, NPs in question are supplied predicative informations from
the context of use so that truth values of whole sentences are
determined. As the predicative elements, we will introduce a
property variable P_0. The value of this variable is determined
by the context of use (for the status of free variable in such a
case see Cooper(1979)).
        Let us discuss this P_0 in more detail. How should we apply
P_0 to NP? For example, (12b) seems to have, at least, four
intrinsic structures according to syntactic position of <u>John</u> as
demonstrated in (17), where [   ] represents 'an event' which
<u>John</u> is used to express:

(17)a. [NP(John) ITV]
    b. [NP(John) TV NP]
    c. [NP TV NP(John)]
    d. [NP TV NP NP(John)   ]

<u>John</u> might be the subject of the intransitive verb or the
transitive verb, or the direct(or indirect) object of the
transitive verb. For example, what the boss was unwilling to do
might be to have John go to Tokyo in business (17a), or to employ
John. To put it differently, it is not fixed which category P_0
belongs to, or which argument-position is gapped.
        Although at first sight, this looks like an inevitable

difficulty, we may avoid this by noting a relation between arguments and predicates. That is, once an individual was picked out from a proposition, P_0 is automatically provided as predicating something of this individual. Note that even if an individual is in object position like <u>John</u> in (17c), it is picked out as a logical subject. Therefore, it is not unreasonable to assume that predicate P_0 is provided with a form of passive in (17c), if we also assume that passivization does not change meaning, or at least, that passivization does not change truth conditions. Hence, we assume P_0 to be brought out from the context of use in a way of satisfying its argument. In the case (12b), P_0 is combined with an argument <u>John</u> to produce a proposition P_0(john). Then, we will say that <u>John</u> is eventualized.

Then, we will introduce an operation, E-1. E-1 is an application of a free variable over properties to an individual. This is illustrated as follows:

S-1: If α is a P_T , then E-1(α) is a sentence.

T-1: If α is an eventualized item, then E-1(α) translates
into $(\alpha)(^\wedge P_0)$

1-3.   As a next step, we change P_0 (John) into the set of events. Then, we will employ the notation of Reihenbach(1964). His basic idea is so simple and flexible that we think his method works well, although some difficulties(but irrelevant to this discussion) have been pointed out. (18) is the notations used by Reihenbach:

(18)a. $[f(x_1)]*$
   b. $(_? v)[f(x_1)]*(v)$
   c. $f(x_1) = [f(x_1)]*(v_1)$

(18a) is an event predicate or situational fact function. (18b) is an event description that refers to the event indicated by sentence $f(x_1)$. A sentence can be split up into an event predicate and a proper name (v_1) for an event, as demonstrated in (18c).

Modifying his notation to serve our purpose, we will present a translation of items changed into the set of events as T-2 in (19):

(19)   T-2:   If α is a P_{cN} or a P_{IV} , then E-2 (α) translates
into $\lambda x^e [[\exists x^o(\alpha)(x^o)]*(x^e)]$

If α is a P_t , then E-2 (α) translates into
$\lambda x^e[[\alpha]*(x^e)]$

(19) means that the operation E-2 changes α into the set of events which has a property $[\alpha]*$ or $[\exists x^o(\alpha)(x^o)]*$. Here, eventualized items are regarded as nouns. The variable x^e in T-2 is of type e and its sort is an event. In addition, we will use the sortal variable x^o as representing an object. This distinction between 'object' and 'event' is not of absolute nature, as mentioned earlier. This is a minimum distinction required here to

discuss a certain properties of NPs. If we want, it might be possible to reduce an object into an event, or it might be possible to dispence with a sortal distinction. As a matter of fact, E-2 is a sort of nominalization, for eventualized items are finally realized as noun phrases. However, it does not follows that this step is equal to nominalization. E-2 is, so to speak, part of nominalization.

In discussing nominalization, Chierchia(1982) pointed out that an inflation of type-levels occurs if propositions or properties are in argument-positions. However, the method adopted here can avoid the type inflation.

Other rules for E-2 are demonstrated as follows:

S-2: If α is a P_{cN} or P_{IV} , then E-2(α) is a noun.
T-2: = (19)

S-3: If α is a nominalized item, then F (α) is a term(T),
　　　　　　　　　　　　　　with i ϵ { general, particular }

T-3: F-general(α) translates into $\lambda P \forall x^e [\delta'(x^e) \longrightarrow P\{x^e\}]$
　　　F-particular(α) translates into $\lambda P \exists x^e [\delta'(x^e) \wedge P\{x^e\}]$

1-4.　　Thirdly, putting these observations together, we could regard, for example, <u>John</u> in (12b) as having the following translation:

(20)　John　: $\lambda Q \exists x^e [[P_0(j)]*(x^e) \wedge Q\{x^e\}]$

The process to this line is represented by (21): [3]

(21)　　　　　　　　John　$\lambda Q \lambda x^e [[P_0(j)]*(x^e) \wedge Q\{x^e\}]$
　　　　　　　　　　　|
　　　　　　　　　　John　$\lambda y^e [[P_0(j)]*(y^e)]$
　　　　　　　　·····|
　　E-2 ····　　　　John　　$P_0(j)$
　　　　　　·····|
　　E-1 ····　　　　John　　$\lambda P^{\vee}P(j)$

In the first step, the operation of 'E-1' is applies to John. Secondly, 'E-2' is applies to the result of it, $P_0(j)$. Finally, <u>John</u>$_{cN}$ is changed into <u>John</u>$_T$ according to particularity or generarity.[4]

Finally, we get the translation (22a) for the sentence (12b). Compare (22b) with (22a):

(22)a. Syunin-wa John-o sibutteiru.
　　　$\exists y^o [\forall x^o [boss'(x^o) \longleftrightarrow x^o = y^o] \wedge hesitate'(y^o,$
　　　　　　　　　　　　　$\wedge \lambda Q \exists x^e [[P_0(j)]*(x^o) \wedge Q\{x^e\}])]$

　　b. Syunin-wa John-o sikatta.
　　　$\exists y^o [\forall x^o [boss'(x^o) \longleftrightarrow x^o = y^o] \wedge reproach'_*(y^o, j)]$

2-1.   Let us now turn to other cases, which contain preposi-
tional phrases. We have pointed out in Section 0 that examples
such as (3b,c) have sortal discrepancies. We will repeat (3)
below:

(23)a. John-wa dokusya kara no tegami-o yabutta. (= 3a)
              readers from   letter   tear
       (John broke letters from his readers)

    b. John-wa dokusya kara no tegami-o tetudatta. (= 3b)
              readers from   letter   help
       (Lit. John helped letters from his readers)

    c. John-wa dokusya kara no tegami-o sirasareta. (= 3c)
              readers from   letter   be-informed
       (John was informed of letters from his readers)

(23a) is sortally   correct,   since a sort-type of the predicate
yaburu(tear) coincides with a sort-type of the argument dokusya
kara no tegami(letters from his readers). This argument is used
to denote an event in (23b). As we have mentioned, it is unusual
for letters to require John's help. What (23b) means actually,
for example, might be that John helped someone to sort out
important letters from unimportant ones. (23c) predicates some
event too. Because, John must have been informed of something
'informative' about letters.
     In addition, (23 b,c) seem to be different in meanings of
this NP(dokusya kara no tegami). (23b) means that the letters
from readers have some property, say, P_0 , whereas (23c) does not.
Rather (23c) means that John was informed that letters came from
his readers.
     These   intuitive readings of (23a-c) might be roughly
paraphrased as one of possible readings respectively as follows:

(24)a. John-wa dokusya kara kita tegami-o yabutta.
       (John tore letters from his readers)

    b. John-wa dokusya kara kita tegami-o seirisuru no-o tetuda-
       tta. (John helped to sort out letters from readers)

    c. John-wa dokusya kara tegami-ga kita no-o sirasareta.
       (John was informed that letters came from his readers)

     As an approximation of the meanings of the NP dokusya kara
no tegami in each of (23a-c), we suggest (25a-c), where for
convenience, we will regard the translation of dokusya as
$\lambda P {}^{\vee}P(d)$.

(25)a. dokusya kara no tegami (23a)
       $\lambda x^0[$ from'($^{\wedge}$ $\lambda P{}^{\vee}P(d)$)($^{\wedge}$of')(x^0) $\wedge$ letter'(x^0)]

    b. dokusya kara no tegami (23b)
       $\lambda x^e[$ $\exists x^0[$ from'($^{\wedge}\lambda P{}^{\vee}P(d)$)($^{\wedge}$of')($x^0$) $\wedge$letter'(x^0)
                                              $\wedge P_0\{x^0\}]]*(x^e)$
    c. dokusya kara no tegami (23c)

$$\lambda x^e [\ \exists x^o [\ \text{from}'(^\wedge\lambda P^\vee P(d))(^\wedge\text{of}')(x^o) \wedge \text{letter}'(x^o)]]*(x^e)$$

In producing (25), we will translate the case-marker <u>no</u> as follows:[4]

(26) 'no$_1$' ==> $\lambda Z\ \lambda Q\ \lambda x^o (\ ^\vee Z(^\wedge\text{of}')(x^o) \wedge Q\{x^o\})$

Z is used as a variable for the sense of prepositional phrases (for example, $^\wedge\text{from}'(^\wedge \lambda P^\vee P(d))$), which is of type $\langle s, \langle\langle s, f(IV)\rangle, \ f(IV)\rangle\rangle$. We assume that the preposition <u>from</u> creates an extensional context.

As for <u>of</u> in English, its translation seems to be comparatively unfixed, comparing with other items. For example, in order to translate the CN <u>portrait of John</u>, Bennett(1976) introduces 'portrait of' as CN/T from the start, whereas Thomason(1976) combines <u>of</u> with <u>John</u>, and regards 'of John' as ACN (= Adj)(where <u>of</u> is regarded as ACN/T). The problem of which category we should assign to <u>of</u> holds true of Japanese. However, we will not pursue this problem here, but employ a method which is essentially along to the lines of Bartsch(1981). In treating gerunds, she proposed that <u>of</u> be treated as a two-place relation expression. We will treat <u>no</u> in Japanese as containing a one-place or two-place expression. The reason of treating <u>no</u>(and <u>of</u>) as a predicative expression is that by doing so, we might be permitted to make <u>of</u> carry a certain semantic content.

<u>No</u> in Japanese has some different usages from <u>of</u> in English. For example, <u>dokusya kara no tegami</u>(readers + from + of + letters) is acceptable, whereas <u>letters of from readers</u> is not. On the other hand, <u>Mary no hon</u>(Mary + of +books) and <u>books of Mary</u> are both acceptable. In the latter case, <u>no</u>(and <u>of</u>) will be treated as a two-place expression. Then, <u>of'</u> contained in the translation of <u>no</u>(and <u>of</u>) would be 'is possessed by' or the like. In the former case, we propose that <u>no</u> is treated as a one-place expression. we will call it 'no$_1$'. (26) is the translation in this case. Then, <u>of'</u> would represent an abstract relation between readers and letters.

The reason we regard <u>of'</u> as a one-place expression in combinding <u>of'</u> with prepositional phrases is that if <u>of'</u> is regarded as a two-place relation, CNs making no sense usually come out as illustrated in (27). On the other hand, examples in which <u>of'</u> represents a one-place expression are usually acceptable (e.g., (28))[5]

(27)a. Kaze-ga umi kara sikke-o hakondekita.
     wind   sea from moist   bring
     (The wind brought a moist from the sea)

 ==>b.?umi kara no sikke no kaze

(28)a. Kaze-ga kita kara fuitekita.
     wind   north from blow
     (The wind was blowing from the north)

 ==>b. kita kara no kaze
     (the wind from the north)

Let us return to translations of (23a-c). (23a) would receive the translation (29a)(under two appropriate meaning postulates). (25a) would be derived as demonstrated in (29b):

(29)a. John-wa dokusya kara no tegami-o yabutta. (23a)
$\exists x^o[$ yaburu'$(j,x^o) \wedge$ from'$_*(d)(^of')(x^o) \wedge$ letter'$(x^o)]$

   b. dokusya kara no tegami (25a)
   dokusya $\Rightarrow \lambda P^{\vee}P(d)$ (for convenience)
   kara $\Rightarrow$ from'
   dokusya kara $\Rightarrow$ from'$(^ \lambda P^{\vee}P(d))$
   no $\Rightarrow \lambda Z \lambda Q \lambda x^o(^{\vee}Z(of')(x^o) \wedge Q\{x^o\})$
   dokusya kara no $\Rightarrow \lambda Q \lambda x^o(from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge Q\{x^o\}]$
   tegami $\Rightarrow$ letter'
   dokusya kara no tegami $\Rightarrow$
        $\lambda x^o(from'(^ \lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o))$

(23b) would receive the translation (30a). (25b) would be derived as demonstrated in (30b):

(30)a. John-wa dokusya kara no tegami-o tetudatta. (23b)
   help'$(j, ^ \lambda Q[\exists x^e[[\exists x^o[from'_*(d)(^of')(x^o) \wedge letter'(x^o)$
                               $\wedge P_o\{x^o\}]]*(x^e) \wedge Q\{x^e\}])$
   b. dokusya kara no tegami (25b)
   $\lambda x^e[\exists x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o)$
                                $\wedge P_o\{x^o\}]]*(x^e)$
   E-2
   $\exists x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o) \wedge P_o\{x^o\}]$
   E-1
   $\lambda Q \exists x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o) \wedge Q\{x^o\}]$
   E-2
   $\lambda x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o)](= 29b)$

Note that the variable x^e has a property which presents approximately that letters came from readers and letters were sorted out.
   (22c) would receive the translation (31a). (25c) would be derived as demonstrated in (31b);

(31)a. John-wa dokusya kara no tegami-o sirasareta.
   be-informed'$(j, ^{\wedge}\lambda Q[\exists x^e[\exists x^o[from'_*(d)(^of')(x^o)$
                      $\wedge letter'(x^o)]]*(x^e) \wedge Q\{x^e\}])$

   b. dokusya kara no tegami
   $\lambda x^e[\exists x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o)]]*(x^e)$
   E-2
   $\lambda x^o[from'(^{\wedge}\lambda P^{\vee}P(d))(^of')(x^o) \wedge letter'(x^o)]$ (= 29b)

, where the variable x^e has a property which presents approximately that letters came from readers.

3.   We have discussed problems concerning a sortal discrepancy. In making a sortal distinction in the domain of entities, it is required that (i) predicates are basically defined according to what sort of entities their arguments denote, and that (ii) sort-types of predicates coincide with those of their arguments. We have pointed out that, when (i) is presupposed, there are cases in which (ii) is not be satisfied in Japanese. First, we have examined examples with sortal discrepancies. Secondly, we have provided a model-theoretic treatment of them. Then, we have introduced two operators. One is a sort of nominalization. The other serves to present events which object-sorted NPs are used to express; this operation applies a free variable P_0 to Terms.

NOTES
I am grateful for helpful suggestions from the members of KLC, essentially, Tadaharu Tanomura.

1.   First, the predicate 'mezurasii' can take the particle to   optionally,   whereas   predicates requiring object-sorted arguments cannot. Consider the following examples:
(i)a. Suika to wa mezurasii.
   b.*Suika to wa amai.
Secondly, the particle to also directly follows a sentence like (ii), where John ga kuru(John comes) expresses an event:
(ii) John ga kuru to wa mezurasii.
Finally, in the case where a particular object is predicated of, (iiia) is more natural than (iiib):
(iii)a. Kang-Kang wa mezurasii doobutuda. (Kang-Kang is a rare
        animal)
     b ?Kang-Kang wa mezurasii. (Kang-Kang is rare)
In (iiia) mezurasii is used as adjectives, not predicatives.

2.   In preparation.

3.   As Dowty(1979) pointed out, in the UG system the requirements of disambiguated language would not literally allow any syntactic operation to give exactly the same expression as output that it takes as input. For a few suggestions to resolve this problem, see Dowty(1979).

4.   Concerning a property of of', we will not pursue here. We might deal it with along to the lines of Dowty(1979).

5.   Some expressions might be admitted, although acceptability falls down. In this case, we also would have of' represent the two-place relation.

6.   We assume that generarity or particularity in the translation rule is applied at the same time for double applications.

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