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Japanese Passives and Quantification in Predicate Position

1. Introduction

What is a voice in the grammatical sense? Although there might be many different answers to this question, we adopt one particular answer to it here. According to this, a voice is a grammatical operation with a certain definite meaning which changes the argument structure of a verb phrase¹.

We assume that a verb denotes a certain class of events or states while singling out a number of the objects which play some determinate roles in them. Those participants of the events or states denoted by a verb are called the arguments of the verb, and the expressions that refer to them are called the argument expressions. Each verb takes a determinate number of arguments. When a verb is used in a sentence, its argument expressions must be arranged in a certain way, and we should be able to know which element of the sentence goes with which argument. What makes it possible to do this is a case system. Each argument expression is accompanied by some feature which makes it possible to recognize which argument of the verb it corresponds to. Such a feature of an argument expression is called a case. Thus, a case tells you which expression in a sentence corresponds to which argument of the verb contained in it.

There are several ways to implement a case system.

1. The case of an argument expression is just its position in a sentence.
2. The case of an argument expression is signalled by adjoining some expression (a case particle) that announces the case of the attached expression.
3. The case of an argument expression is signalled by changing the argument expression itself (inflection or declension).

For example, consider a pair of English sentences

- (1) Mary scolded John.
- (2) John scolded Mary.

The case of “Mary” in (1) and that in (2) are different, because “Mary” appears before the

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¹ This means I identify a voice with what E.L.Keenan and L.M.Faltz called a valency affecting operation. See [Keenan and Faltz 1985]. p.202

verb “scolded” in (1) while it appears after the verb. So, here is an example of a case system in which the case of an expression is just its position in the sentence. If you want an example of a case system that is implemented solely by the positions of the argument expressions in a sentence, you have it in the standard language of modern logic. In a logical formula like

$$P(x_1, x_2, \dots x_n)$$

the argument expressions $x_1, x_2, \dots x_n$ have different cases because they have different positions in the formula. We might even refer to the different cases just by numbers so that “the expression of the case 3” refers to the argument expression which appears in the third position in the above formula.

In contrast, consider a pair of Japanese sentences

- (3) Hanako ga Taro o shikat- ta.
 NOM ACC scold Past
 (Hanako scolded Taro.)
- (4) Hanako o Taro ga shikat- ta.
 ACC NOM scold Past
 (Taro scolded Hanako.)

Notice that “Hanako” and “Taro” retain the same positions in (3) and (4). But, they have different cases. What makes them different is the fact that the case particles “ga” and “o” are attached to the different expressions in them. Japanese is one of the languages in which a case is signalled by a case particle.

For each verb V , there are

- (i) a definite number of arguments x_1, x_2, \dots, x_n ,
- (ii) different roles R_1, R_2, \dots, R_n these arguments play in the event or state denoted by V , and
- (iii) different cases C_1, C_2, \dots, C_n the argument expressions take when they appear in a sentence.

It is sometimes supposed that there is a universal set of cases common to different languages. In this paper, we do not make such an assumption. Cases are here treated as entirely internal to each language. Thus, although we use notations like “NOM (nominative)” and “ACC (accusative)” commenting on example sentences in Japanese, they are used only to give some hint to the function of a Japanese case particle.

On the other hand, the roles mentioned in (ii) above are for the most part independent of a particular language. They are concerned with the ways how the persons or things are involved in an event or state; if we suppose that an action is an event, a person may

be involved in an event as its agent and being an agent is one of the roles we are talking about. So, there is a strong presumption that there is a set of roles common to different natural languages. However, as it is difficult to establish which roles should belong to such a universal set of roles, we are not going to discuss about this issue, either. Although we assume that there are a number of roles like AGENT, THEME, EXPERIENCER, they are all provisional.

In summary, a verb has a determinate number of arguments each of which has a certain role and is assigned a case. We may call the way the cases are assigned “the arrangement of the arguments”. Then, the argument structure of a verb phrase is determined by the number and arrangement of its arguments. So, a voice belongs to one of the following three kinds of operations.

1. Decreasing the number of the arguments.
2. Increasing the number of the arguments.
3. Rearranging the arguments.

We claim that Japanese passives belong either to the first category or to the second one. It is well known that there are two sorts of passives in Japanese, one is called “direct passives” and the other is called “indirect passives”. Here are typical examples of them.

- (5) Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Taro was scolded.)
- (6) Hanako ga Taro ni seito o
 NOM DAT pupil(s) OBJ
 shika- rare- ta.
 scold PASSIVE PAST
 (Hanako had her pupil(s) scolded by Taro.)

(5) is a direct passive and (6) is an indirect passive. Let us take note that the same passive particle “rare” is used in both.

We claim that the number of the arguments is decreased by one in the former, while the number of the arguments is increased by one in the latter. Thus, a direct passive is an operation of the category 1 above and an indirect passive is of the category 2. This paper, however, is concerned with direct passives. Indirect passives will be the topic of another paper.

A Japanese causative like

- (7) Hanako ga Taro o nak- ase- ta.
 NOM OBJ cry CAUSATIVE PAST
 (Hanako made Taro cry.)

is also an operation of category 2 which increases the number of the verbal arguments by one. In (7) a one-place verb “naku” (cry) is turned into a two-place verb phrase “nakaseru” (make cry) by the suffix “sase”. But obviously a causative construction has a different meaning from an indirect passive construction. This is the reason why each voice is associated with a certain definite meaning in its characterization above. And, this associated meaning is concerned with the different roles arguments play in the events or states indicated by the verb in which they appear.

2. Is a direct passive an operation rearranging the arguments of a verb?

However you may define a voice in the grammatical sense, there would be no objection to say that a passive sentence like (5) should belong to the central cases of grammatical voice. Let us start with looking at how a passive sentence (5) relates to an “active” sentence like (8).

- (8) Hanako ga Taro o shikat- ta.
 NOM OBJ scold PAST
 (Hanako scolded Taro.)

But, it might be asked why (5) was chosen as a typical example of Japanese direct passive sentence, because it might be thought that a passive form of (8) is not (5) but the following (9) or (10).

- (9) Hanako ni Taro ga shika- rare- ta.
 DAT NOM scold PASSIVE PAST
 (Taro was scolded by Hanako.)
 (10) Taro ga Hanako ni shika- rare- ta.
 NOM DAT scold PASSIVE PAST
 (Taro was scolded by Hanako.)

Kiso Nihongo Bunpou (Elements of Japanese Grammar) by Masuoka Takashi and Takubo Yukinori is one of the best books on Japanese grammar. In it, a voice is characterized in the following way.

a grammatical form which involves the phenomena where the cases of adjuncts

change in a regular way by the attachments of certain suffixes²

Their point is seen very well if you compare the passive (9) with the non-passive original (8); with the attachment of the passive suffix “rare-” to the main verb “shikaru”, the cases of two adjuncts, namely, “Hanako” and “Taro”, changes respectively from “ga” and “o” to “ni” and “ga”.

Thus, according to their characterization, a direct passive retains the arguments of an active sentence and changes only the cases of the arguments. This means a direct passive is classified as an operation of rearranging the arguments of a verb.

There are a pair of Japanese verbs which take the same arguments, but differs in their case assignments. Consider the following two sentences.

- (11) Hanako ga Taro ni kat- ta.
 NOM DAT beat PAST
 (Hanako beat Taro.)
- (12) Hanako ni Taro ga make- ta.
 DAT NOM lose to PAST
 (Taro lost to Hanako.)

Two verbs “katsu (beat, win)” and “makeru (lose to)” denote the same class of events with two participants, a person who wins and a person who loses: let me assume that the former is the agent and the latter is the theme of such events. Thus, the difference between these two verbs is only that the cases assigned to its two arguments are interchanged.

According to the view in consideration, the relation between two forms “shikar- (scold)” and “shikar-are- (is scolded)” is just like that of “katsu” and “makeru”; their difference is just the different cases assigned to their arguments.

The people with the background of philosophy or logic³ also tend to regard English sentences like

² [Masuoka and Takubo 1992], p.101 (My translation).

³ Even a philosopher whose work borders with linguistics like Terence Parsons gives a similar account for English passives. See [Parsons 1990] pp.91f. It is fascinating to see that in § 3 of *Begriffsschrift* Frege gave a pair of active and passive sentences (“The Greeks defeated the Persians at Plataea” and “The Persians were defeated by the Greeks at Plataea”) in order to explain what is essential to his logical notation. There Frege claimed that these two sentences have exactly the same content in the sense that they have the same inferential relations with other sentences. We may think that Frege could make such a claim because he held that there holds a logical equivalence between a sentence and a corresponding passive sentence.

(13) John was scolded by Mary.

as a paradigm of a passive and think that a passive is a grammatical operation which interchanges the cases of the arguments. It is interpreted as an operation which turns a two place predicate

scold (x, y)

into another two place predicate with the different order of its arguments, namely,

is_scolded_by (y, x).

Moreover, it is thought that, in the matter of meaning, if a two-place verb v has its passive form “is_v_ed_by”, then the following holds in general.

$\forall x \forall y (y \text{ is_v-ed_by } x \leftrightarrow x \text{ } v \text{ } y).$

Thus, an active sentence (1) is turned into a passive sentence (13) by such an operation, and they have the same truth condition provided they are used in the same context. Hence, a passive formation would be interpreted as turning an expression for a binary relation R into an expression for its converse \check{R} , and the generalization above would be a logical truth.

It seems natural to adopt such a view towards Japanese direct passives. The difference between Japanese and English which is relevant here is only that the cases are marked by case particles in Japanese while they are marked by the word order in English. The generalization above which is expressed in English can be expressed in Japanese, too. If a two-place verb v has its passive form “v-rare”, then the following holds in general.

$\forall x \forall y (x \text{ ni } y \text{ ga } v\text{-rare} \leftrightarrow x \text{ ga } y \text{ o } v)$

The semantic relation between a verb v and its passive form v -rare seems to be similar to that between “katsu” (win) and “makeru” (lose) with which the following holds.

$\forall x \forall y (x \text{ ni } y \text{ ga makeru} \leftrightarrow x \text{ ga } y \text{ ni katsu})$

However, notice that there is an important difference between two cases, that is, when you form a passive sentence from an active one, what you should do is not a simple interchange of case particles like an interchange of “ga” and “ni” in the case of going from “katsu” (win)

to “makeru” (lose). The case particles in a passive sentence are “ga” and “ni”, not “ga” and “o” as in the original active sentence.

The similar remark also applies to English. It is not true that the two argument expressions of an active sentence (1) are simply interchanged in a passive sentence. If it were so, the resulting passive sentence would be

*John was scolded Mary.

A preposition “by” is absolutely necessary if you want to retain the same argument expressions in a passive sentence.

There are indeed many cases where a passive sentence has a different truth condition from the corresponding active sentence. An example in English is this.

(14) Every teacher scolded some students.

(15) Some students were scolded by every teacher.

(14) has two readings. In one reading the scope of “some students” is within that of “every teacher”, while the scope of “some students” extends to the whole sentence in another reading. In contrast to this, there seems to be no such ambiguity in (15); the scope of “some students” extends to the whole sentence, and there is no way to read it in the narrow scope.

An explanation usually given for such a phenomenon would be that it is not caused by a passive formation but by the change in the scopes of the quantifiers owing to the change in the order of their occurrences. Hence, in spite of the existence of apparent counter-examples like the above, we may be able to claim that a passive is a simple operation of exchanging the order of the arguments with no effects on the meaning.

However, if we consider the similar examples in Japanese, we might note that the matter is not so simple. Let us consider the following pair of sentences.

- | | | | | | | | |
|------|---|-------|----------|----------|-----|---------|---------|
| (16) | Sensei | minna | ga | seito | o | shikat- | ta. |
| | teachers | all | NOM | pupil(s) | OBJ | scold | PAST |
| | (Teachers all scolded some pupil(s).) | | | | | | |
| (17) | Seito | ga | sensei | minna | ni | shika- | rare- |
| | pupil(s) | NOM | teachers | all | DAT | scold | PASSIVE |
| | ta. | | | | | | |
| | PAST | | | | | | |
| | (Some pupil(s) was/were scolded by all teachers.) | | | | | | |

While the scope of “seito” in (16) can be interpreted either widely or narrowly, (17) strongly

suggests the scope of “seito” extends to the whole sentence. So far, the situation seems to be similar to that in English.

However, let us consider, instead of (17), the following (17') which has the same word order as (16).

- (17') Sensei minna ni seito ga shika- rare-
 teachers all DAT pupil(s) NOM scold PASSIVE
 ta.
 PAST

I suspect the truth condition of this sentence is not the same as that of (16), but that of (17). Thus, at least in the case of Japanese direct passive, it seems that the change in the word order cannot explain some cases in which a passive formation sometimes changes the truth condition of a sentence.

I would like to maintain that a direct passive is not an operation on the order of the arguments but an operation on their number. My position is much more close to those linguists who hold that a passive construction involves the decreasing of the number of the arguments by one ⁴ rather than to the philosophical and logical tradition.

3. A direct passive decreases the number of the arguments by one

I argue that the verb phrase “shika-rare” that occurs in the passive sentence (5) should be taken not as a two-place predicate but as a unary predicate in contrast to the two-place verb “shikaru” to which a passive suffix “rare” is attached. To do that, we should be clear about what sort of considerations determine the number of arguments for a given verb phrase.

Why do we think “shikaru” is a two-place verb? Let us consider the cases where “shikaru” seems to appear with only one argument.

- (18) Hanako ga shikat- ta.
 NOM scold PAST
 (Hanako scolded.)
 (19) Taro o shikat- ta.
 OBJ scold PAST
 (scolded Taro.)

The fact that such sentences can be used in appropriate contexts has given an impression

⁴ See [Bach 1980]. Also see [Keenan and Faltz 1985] pp.202–227.

to some that a Japanese verb may take any number of arguments including none ⁵. But, this impression is totally wrong. What we should ask is what are those appropriate contexts in which the sentences like (18) and (19) can be used. For example, (18) can be used only in the contexts in which there is an understanding between the speaker and the hearer as to who Hanako scolded. Moreover, this understanding should be expressible by a certain noun phrase which can be recognized to be appropriate by both the speaker and the hearer. Therefore, this should be described as a case of anaphora.

In order to make explicit an anaphoric character of the contextual understanding involved in (18) and (19), we may use the device called “zero pronouns” and formulate them in the following way.

- (18') Ø Hanako ga shikat- ta.
 ZERO-PRO NOM scold PAST
 (Hanako scolded Ø.)
- (19') Ø Taro o shikat- ta.
 ZERO-PRO OBJ scold PAST
 (Ø scolded Taro.)

As these “zero pronouns” naturally do not appear in the uttered sentences, we should have a clear criterion to judge whether a given utterance contains them or not.

It is better to have some concrete case in mind. So, let us take (18) as an example. In order for a speaker to utter (18) and make sense in the course of a conversation, the following two conditions must be met.

1. Either (a) a noun phrase which gives an answer to the question “Whom Hanako scolded?” was already used in the course of the conversation, or (b) there is a supposition believed to be shared by the speaker and the hearer that there is a certain noun phrase which is known to both and answers the question “Who did Hanako scold?” The noun phrase in question might be either (α) a definite one like “Taro” or “sensei” used as a definite noun phrase, meaning a particular teacher or a particular group of teachers, or (β) an indefinite one like “sensei” used as an indefinite noun phrase, meaning some teacher or teachers indefinitely, or even (γ) a quantifier phrase like “dareka” (someone).
2. The noun phrase mentioned in the first condition should be recoverable (in the case of (a)) or suppliable (in the case of (b)). In the case of (18), the hearer always has the right to ask the speaker who Hanako scolded, and the speaker should be able to supply her with an appropriate noun phrase.

⁵ For, even a sentence like

(i) shikat- ta. (scolded.)
 scold PAST

can be used to make a meaningful assertion in an appropriate context.

For example, as all the sentences we have been considering are the sentences which report an event or state that takes place in a particular place and time ⁶, they can be supplemented by phrases that indicate the place or time of the event or state. But, we don't think that a sentence like

- (8) Hanako ga Taro o shikat- ta.
 NOM OBJ scold PAST
 (Hanako scolded Taro.)

is incomplete because it does not contain those phrases that specify the time and place of the reported event. Because we feel no need to seek some anaphoric reference to a place or time specification uttered before the utterance of (8) in order to understand what is said by (8), there is no grounds to think that (8) contains zero pronouns for time or place. To see this, suppose that someone uttered (8) and added further that she did not know when or where Hanako had scolded Taro. There is nothing strange in what she said.

Similarly, I argue that the sentence

- (5) Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Taro was scolded.)

does not contain a “zero pronoun” which stands for somebody or somebodies who scolded Taro, because such a supposition is not warranted by the above criterion.

To see this, let us suppose that (5) contained such a zero pronoun contrary to our claim. Then (5) would be written as

- (5') Ø Taro ga shika- rare- ta.
 ZERO-PRO NOM scold PASSIVE PAST
 (Taro was scolded by Ø.)

According to the criterion above, we should know to which expression the zero pronoun “Ø” has an anaphoric relation in order to understand what is said by the utterance of (5). But, no such knowledge is necessary to understand it. Even though we have no idea about the person or persons who scolded Taro, we can make sense of the utterance of (5). But, in the cases of (18) and (19), a hearer must have a definite idea about the person or persons who Hanako scolded (in the case of (18)) or who scolded Taro (in the case of (19)) to know what is said by the utterances of them.

⁶ For the importance of classifying Japanese sentences into the sentences reporting events or states and the sentences ascribing a property to a subject, see [Iida 2010].

Let us consider three different exchanges in order to see that all this is true. The first two are the following.

- (A) X: Hanako ga shikat- ta. (= (18))
 NOM scold PAST
 Y: Dare o shikat- ta no?
 who ACC scold PAST INTERROG
 X: shira- nai.
 know not
 (X: Hanako scolded. Y: Who did Hanako scold? X: I don't know.)
- (B) X: Taro o shikat- ta. (= (19))
 ACC scold PAST
 Y: Dare ga shikat- ta no?
 who NOM scold PAST INTERROG
 X: shira- nai.
 know not
 (X: scolded Taro. Y: Who scolded Taro? X: I don't know.)

I believe both of these exchanges sound a little strange. Only way I can think of to make sense of them is to suppose that X and Y both knew that some scolding had occurred, but Y did not know who were involved in the scolding. In (A) X knew only who did the scolding, while in (B) X knew only who were scolded. In such a situation, if Y asked X who did the scolding, then X's first assertion in (A) above, which is an utterance of (18), is a good answer to Y's question, and then the succeeding question and answer become understandable. In the case of (B) X's first assertion might have been an answer to Y's question about the identities of the scolded persons, and the similar explanation can be given to the exchange. In both (A) and (B), it must be a common knowledge between X and Y that there had been a scolding. The content of this common knowledge can be made explicit by a sentence such as the following.

- (20) dareka ga dareka o shikat- ta.
 someone NOM someone ACC scold PAST
 (Someone scolded someone.)

Such a sentence might have been uttered in the course of conversation that led to the exchanges (A) and (B). Even if there had not been any explicit statement like (20), the content expressed by it should have been believed by both X and Y, and they should be able to express it whenever they are asked to do.

Now consider the third exchange.

- (C) X: Taro ga shika- rare- ta. (= (5))
 NOM scold PASSIVE PAST
 Y: Dare ni shika- rare- ta no?
 DAT scold PASSIVE PAST INTERROG
 X: shira- nai.
 know not
 (X: Taro was scolded. Y: By whom was Taro scolded? X: I don't know.)

There is nothing strange in this exchange. Y might well have been ignorant of the fact that a scolding of Taro had been taken place. Hence, there is no need to suppose even the existence of common knowledge about some scolding between X and Y. This shows that there is no reason to think that a passive sentence (5) contains a zero pronoun for a person who did the scolding.

In contrast, the utterance of (18) or (19) makes sense only in the context in which the speaker and the hearer have some common way to refer to the person or persons who was scolded (in the case of (18)) or who did the scolding (in the case of (19)) even if it might be by using “dareka” (somebody). Hence, we should judge that (18) and (19) contain zero-pronouns.

There is another argument that shows the passive form “shika-rare-” is a unary predicate and does not have an argument for an agent of a scolding event.

Suppose X was talking with Y, and Y said (18) [= “Hanako ga shikatta” (Hanako scolded)] to X. Also suppose X met Z afterwards, and Z said

- (21) Taro ga shikat- ta.
 NOM scold PAST
 (Taro scolded.)

to X. In such a situation, X cannot combine Y's assertion and Z's assertion, namely, X cannot assert

- (22) Hanako to Taro ga shikat- ta.
 and NOM scold PAST
 (Hanako and Taro scolded.)

because it might happen that the person(s) Y (and X) believed to be scolded by Hanako and the person(s) Z (and X) believed to be scolded by Taro were different. However, if X had some grounds to think that Y and Z had been talking about the same person or persons when they uttered (18) and (21), then X may be justified in asserting (22).

In the same situation, suppose what Y said to X was the following.

- (23) Hanako ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Hanako was scolded.)

and what Z said to X was (5) [= “Taro ga shikarareta” (Taro was scolded)]. This time there were no obstacles for X to combine these two and assert

- (24) Hanako to Taro ga shika- rare- ta.
 and NOM scold PASSIVE PAST
 (Hanako and Taro were scolded.)

If there were zero-pronouns present in (5) and (23), then we would be justified in inferring (24) only when those alleged zero-pronouns in (5) and (23) were anaphorically related to the same persons, as we saw in the case of (22). But, there is no similar restriction in the inference of (24) from (5) and (23). Such a contrast between (18) and (5) gives us a strong ground to think that (5) does not contain a zero pronoun unlike (18).

4. A direct passive is a form of existential quantification

We have argued that a Japanese direct passive is an operation which decreases the number of the arguments of the verb by one. Now, we should ask what its semantic nature is.

A natural answer is that a direct passive quantifies existentially the agent argument of a verb. Consider the following (25), which is an existentially quantified sentence.

- (25) Dareka ga Taro o shika- ta.
 somebody NOM ACC scold PAST
 (Somebody scolded Taro.)

This always implies (5), namely “Taro ga shikarareta” (Taro was scolded), whose main verb is in passive form. You might think that the converse also holds, that is, that (5) implies (25). But, it is not true; sometimes it may happen (25) is not true even though (5) is true. For, as “dareka” is a noun phrase quantifier, it is quite sensitive to the context of its use and its intended domain varies with the context, just as English “somebody” is. In contrast, a direct passive does not seem to have the same kind of the sensitivity to the context.

For example, the following exchange makes a perfect sense because “daremo” (anybody) in Y’s utterance may mean “anybody among those present” while a person (or persons) who scolded Taro might not be among them.

- (D) X: Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 Y: Daremo shikatte- inai.
 anybody scold NEG
 (X: Taro was scolded. Y: No one scolded Taro.)

However, in this case X might continue the conversation with saying to the effect that X and Y should take in account also the people who are not present. Given such an extended domain, X and Y both will agree to the sentence “Dareka ga Taro o shikatta” (Somebody scolded Taro). Hence, we may conclude that (5) implies (25) in a context where “dareka” is accompanied with an appropriate domain.

All this strongly suggests that a direct passive is another way of existentially quantifying a predicate. It is different from the usual noun phrase quantification in two respects. First, it is internal to the predicate in the sense that it makes an existentially quantified predicate which replaces the original predicate. Second, it is not so sensitive to the context as the latter sort of quantification. We are going to discuss this point in more detail later on.

Now that we have a rough idea of a Japanese direct passive both syntactically and semantically, it is time to make precise the syntax and semantics of direct passives. In order to do this, let us introduce some pieces of formalism.

A verb will be represented in this way.

shikaru (X^{ga} ; Y^o)

There are two points to be made about such a style of representation.

1. Capital letter variables like “ X ” and “ Y ” are plural variables, or to be more precise, number-neutral variables. (We also use lower case variables like “ x ” and “ e ” as singular variables.) We are going to use plural logic as the logic of our metalanguage⁷. This is a natural option for a language like Japanese which has no grammatically systematic distinction between numbers and whose expressions are mostly number neutral. The merit of using plural logic in the metalanguage becomes especially clear when the metalanguage itself is Japanese. But, it is sometimes very awkward if the metalanguage is a language like English where it is necessary to keep a number distinction, as you will see.

Consider the following sentence.

- (26) Sensei ga seito o shikat- ta.
 teacher(s) NOM pupil(s) ACC scold PAST
 (Some/the teacher(s) scolded some/the pupil(s).)

⁷ For plural logic see [McKay 2006], [Yi 2005], and [Yi 2006].

Although it has to be determined from the context whether “sensei” and “seito” in this sentence are used definitely or indefinitely in order to understand it, it is not necessary to decide whether they are singular or plural for its understanding, and sometimes it is not possible to do that, either. They are simply number neutral expressions as is usual the case with a Japanese noun.

2. As the cases of the arguments are indicated by case particles in Japanese, there is no reason to prefer one particular ordering in exhibiting the arguments of a verb. To emphasize this fact, we use the notation like

$$(A_1; A_2; \dots; A_n)$$

where A_1, A_2, \dots, A_n can be interchanged freely in any order. Thus, the above representation of the verb “shikaru” may also be written like this.

$$\mathbf{shikaru} (Y^0; X^{\text{ga}})$$

This is just a notational variant of the above, and there are no significant differences between the two.

We suppose there is a relation called “semantic value relation” between an expression and an entity or entities. It is written like

$$V(X, \alpha)$$

and read as “ X is/are (a) semantic value(s) of α ”. Note that X is a number neutral variable. The semantics of an expression is given by specifying a semantic value relation for that expression.

A semantic value of a verb such as “shikaru” is an event. Thus,

$$V(e, \mathbf{shikaru} (X^{\text{ga}}; Y^0)) \Leftrightarrow e \text{ is a scolding event,} \\ X \text{ is/are the agent(s) of } e, \text{ and } Y \text{ is/are the theme(s) of } e.$$

As the passive suffix “rare” binds the agent(s) argument ⁸ of a verb, we represent it with a variable that will be bound by it like

$$\mathbf{rare}_X$$

⁸ As we are using plural logic in our metalanguage, a thematic role of an event may be filled by a plurality of entities. When we talk about *the* agents or *the* themes of an event, we assume that there are the unique plurality of entities each of which is an agent (theme) of the event.

Then, a passive form “shikarareru” has the following representation.

$$(\text{shikaru } (X^{\text{ga}}; Y^{\text{o}})) \text{ rare}_X$$

This is transformed into a unary predicate with a case change in Y

$$\text{shikarareru } (Y^{\text{ga}}).$$

“Rare” is also applicable to ternary verbs like “okuru” (send). As the following formal representation shows, “okuru” has three arguments.

$$\text{okuru } (X^{\text{ga}}; Y^{\text{o}}; Z^{\text{ni}})$$

Semantically, X^{ga} are agents (senders), Y^{o} are themes (those which are sent), and Z^{ni} are goals (receivers). For a passive form of “okuru”, namely,

$$(\text{okuru } (X^{\text{ga}}; Y^{\text{o}}; Z^{\text{ni}})) \text{ rare}_X$$

either of the following two forms is possible.

$$\begin{aligned} &\text{okurareru } (Y^{\text{ga}}; Z^{\text{ni}}) \\ &\text{okurareru } (Y^{\text{o}}; Z^{\text{ga}}) \end{aligned}$$

This pattern is generally true with a passive form of a ternary verb. You can give a “ga”-case to either of the arguments which had “o” or “ni” as its case before the agent(s) argument is bound by “rare”.

The semantic function of “rare” can be seen from the following semantic axiom.

Axiom (Direct Passive)

(i) Let $\mathbf{v} (X^{\text{ga}}; Y^{\text{o}})$ be a verb where X stands for agents. Then,

$$V(\mathbf{e}, (\mathbf{v} (X^{\text{ga}}; Y^{\text{o}})) \text{ rare}_X) \Leftrightarrow \exists X V(e, \mathbf{v} (X^{\text{ga}}; Y^{\text{o}})).$$

(ii) Again, let $\mathbf{v} (X^{\text{ga}}; Y^{\text{o}}; Z^{\text{ni}})$ be a verb where X stands for agents. Then,

$$V(\mathbf{e}, (\mathbf{v} (X^{\text{ga}}; Y^{\text{o}}; Z^{\text{ni}})) \text{ rare}_X) \Leftrightarrow \exists X V(e, \mathbf{v} (X^{\text{ga}}; Y^{\text{o}}; Z^{\text{ni}})).$$

This axiom claims that a direct passive suffix “rare” existentially quantifies the agent argument of a verb which contains both an agent argument and a theme argument.

Let us see how the truth conditions of some simple passive sentences are derived with the use of this axiom. Before doing that, however, it is necessary to have a rough idea of the semantics of simple event sentences, because passive sentences are a species of event sentences.

A simple event sentence consists of three parts.

- (a) A verb phrase which is the core of an event sentence.
- (b) A number of noun phrases with case particles or postpositions and/or adverbial phrases, which precede the verb phrase. They are sometimes called “adjuncts”.
- (c) A tense particle at the end of the sentence.

For example, take a passive sentence

- (5) Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Taro was scolded.)

This sentence consists of (a) a verb phrase “shikarare”, which is in passive form, (b) a noun phrase with a case particle “Taro ga”, and (c) the past tense particle “ta”. A verb phrase denotes a class of events of a certain type, and the other two parts of the sentence restrict this class further. First, by the part preceding the verb phrase, the class is restricted to those events which satisfy the qualifications given in it. In (5) “Taro ga” restricts the events to those in which Taro takes part in an appropriate role. Secondly, the class of events is further restricted to those that take place in a certain period determined by the tense particle together with the context of an utterance. Thus, in (5) it is enough to consider only those events which occur in a certain period before the time of the utterance because (5) is in past tense.

Suppose (5) is uttered in the context *C*. (5) is true relative to this context if and only if there are events which are among the semantic values of the verb phrase “shikarare” and further satisfy the following two conditions; first, they have Taro as their theme argument, and second, they occur in a certain period *I* which is prior to the time of the utterance. What are the events which are the semantic values of “shikarare” and have Taro as their theme argument? According to the axiom above, they are those events *e* such that for some *X* the following holds:

$$V(e, \text{shikaru } (X^{\text{ga}}; \text{Taro}^o))$$

which is the same as

For some X , e is a scolding event, X is/are agent(s) of e , and Taro is the theme of e .

Thus, the events denoted by “Taro ga shikarare” are the events such that somebody or somebodies scold Taro. Together with the restriction given by the tense, we can conclude that (5) is true in C if and only if there are some events prior to the utterance time which are the scoldings of Taro by somebody or somebodies.

Let us try another sentence.

- (27) Seito ga shika- rare- ta.
 pupil(s) NOM scold PASSIVE PAST
 (The/A/Some pupil(s) was/were scolded.)

As is shown here, there are several possible readings of this sentence. As we have adopted plural logic, we need not distinguish singular readings from plural readings. Then, there are two readings of (27): according to one reading, “seito” is definite and refers to some particular pupil(s), and according to another, it is indefinite and means just “some pupil(s)”. These two readings can be distinguished by trying to see whether (27) can be paraphrased to the following (28) in its context of use ⁹.

- (28) shika- rare- ta seito ga iru.
 scold PASSIVE PAST pupil(s) NOM exist
 (There is / are some pupil(s) who was scolded.)

If the use of (27) can be paraphrased to (28), then “seito” in it is indefinite, and if not, it is definite.

The reading with definite “seito” can be dealt with just like (5). Suppose (27) is uttered in the context C , and the speaker meant Taro and Hanako by “seito”. Then, (27) has the same truth condition as the following has in the same context C .

- (29) Taro to Hanako ga shika- rare- ta.
 and NOM scold PASSIVE PAST
 (Taro and Hanako were scolded.)

Unfortunately it happens that (29) has two different readings, because the plural subject “Taro and Hanako” might be either distributed or undistributed. If it is distributed, (29) had the same truth condition as an English sentence “Taro was scolded and Hanako was scolded”. If

⁹ Cf. [Iida 2007].

it is undistributed, then (29) is not equivalent such a conjunction. Deriving the truth condition of the distributed reading is just like deriving that of (5) twice over and there is nothing new. If we turn to the undistributed reading, we also find it quite easy. Only difference from the case of (5) is that the theme(s) of the relevant events is not just one person Taro but two persons, Taro and Hanako.

So, let us try (27) with an indefinite “seito”. This time we proceed a little more formally. First of all, (27) with such a reading might be represented as follows.

$$\{(\exists X \text{ seito}(X)) (\text{shikarareru}(X^{\text{ga}}))\} \text{ta}$$

For, as remarked above, (27) with an indefinite “seito” is equivalent to an existential statement (28); so, we may suppose that the noun phrase “seito ga” works as a (restricted) existential quantifier.

This representation of (27) can be rewritten thus.

$$\{(\exists X \text{ seito}(X)) (\text{shikaru}(Y^{\text{ga}}, X^{\text{o}}) \text{ rare}_Y)\} \text{ta}$$

Suppose (27) is uttered in the context C . Then, the tense particle “ta” indicates that the relevant events must be those happened in some period prior to the time of C . Let I be such a period. Moreover, C determines a certain class of entities as its contextual domain. Let D^C be such a domain.

Then, the necessary and sufficient condition for (27) to be true relative to C , is that there are some events e which occur in I and are among the semantic values of the tenseless part of (27), namely

$$(\exists X \text{ seito}(X))((\text{shikaru}(Y^{\text{ga}}, X^{\text{o}}) \text{ rare}_Y)).$$

The latter condition can be spelled out as follows.

There are some X such that X are pupils within D^C and e is among the semantic values of “ $(\text{shikaru}(Y^{\text{ga}}, X^{\text{o}}))\text{rare}_Y$ ”.

But, by the axiom of direct passive,

e is among the semantic values of “ $(\text{shikaru}(Y^{\text{ga}}, X^{\text{o}}))\text{rare}_Y$ ” if and only if, for some Y , e is among the semantic value of “ $\text{shikaru}(Y^{\text{ga}}, X^{\text{o}})$ ”.

This comes to

e is among the semantic value of “**shikaru**(Y^{ga} ; X^{o})**rare** $_Y$ ” if and only if, for some Y , e is a scolding event, Y are the agents of e , and X are the theme of e

Putting all together, we can state the truth condition of (27) relative to the context C thus.

There are some X and Y such that X are pupils within D^C , e is a scolding event which occur in I , Y are the agents of e , and X are the theme of e .

Of the two variables X and Y , Y has no restriction on its domain, while X has a restricted domain D^C . Isn't it an oversight? Yes and no. In reality, Y also has a restricted domain, but it is not the same as D^C and usually much wider than it. Moreover, the domain for Y is implicitly given by the fact that they are the agents of the events which take place in a particular time interval I . This domain is determined once this particular time interval I is given. Hence, there is no need to explicitly specify this domain.

At any rate, we are going to see how the domain of Y is fixed in more detail in the next and last section of this paper.

5. Nominal quantification vs. quantification in predicate position

The most interesting thing about a direct passive is that it is a quantificational device. It is usually assumed that quantification in a natural language is done by noun phrases or adverbs and it is not generally recognized that there are quantificational devices other than them.

Hence, a direct passive is interesting because it is a quantificational device that functions within a predicate. In the following sentence, we have another example of quantification within a predicate.

- (30) Hanako wa hahaoya da.
 TOPIC mother is
 (Hanako is a mother.)

“Hahaoya” (mother) is a noun which takes an argument, because a mother is always a mother of somebody. Such a noun may be called a relational noun; it is essentially a relational expression which is properly used as “ x wa y no hahaoya da” (x is the mother of y). There are several ways to fill the argument of a relational noun. It can be filled by a proper name, a common noun, or a quantifier expression. The following examples show how this is done.

- (31) Taro no hahaoya
 GEN mother
 (Taro's mother)
- (32) futago no hahaoya
 twins GEN mother
 (the mother(s) of twins)
- (33) dareka no hahaoya
 somebody GEN mother
 (somebody's mother)

However, a relational noun can be used without any explicit argument just as it is done in (30). It is done also in the following example.

- (34) Hahaoya ga ki- ta.
 mother(s) NOM come PAST
 ((A) mother(s) has / have come.)

In (30) “hahaoya” is a part of the predicate of the sentence, while in (34) it is a noun phrase which precedes the predicate. In both cases, “hahaoya” appears without an explicit argument, but we should think it has an argument implicitly because it is a relational noun. In (34), the argument is present in an anaphoric way. There is a reason to think that (34) should contain a zero-pronoun. For, in order to understand the utterance of (34), we must know whose mothers are in question; we need not to know the identities of those, but we should know the extent of persons who might be the children of the mothers in question.

The situation is totally different with (30). In order to understand its utterance, we don't need to know whose mother Hanako is. If Hanako is somebody's mother, then (30) is true, otherwise it is false. This means that “hahaoya” which occurs in predicate position in (30) contains a hidden existential quantification and that we can understand it without a contextual specification of the domain of quantification. You should note that this is remarkably similar to the case of a direct passive; it is also an existential quantification which occurs in a predicate position and does not seem to need a contextual specification of the domain.

It is instructive to compare (30) with the following (35).

- (35) Hanako wa dareka no hahaoya da.
 TOPIC somebody GEN mother is
 (Hanako is somebody's mother.)

The semantic contents of (30) and (35) seem to be the same. But they are not. Because (35) contains an existential quantifier “dareka” explicitly, its domain must be given by the context

and it can change widely according to the context. Hence (35) is true only if Hanako is the mother of somebody who is in the domain given by the context. In contrast to this, in order to know the truth value of (30), if Hanako is the mother of somebody, there is no need to see whether this person is in the right domain or not. Now it is easy to see (30) does not necessarily imply (35) although (35) implies (30), just as it was the case with a similar case in a direct passive¹⁰

Why is it that in the case of quantification in predicate position its domain does not seem to be affected by any change of the context? But, in reality, it is not true that its domain is not affected by any change of the context. The reason why it does not seem to be so is that the influence from the context is never immediate as is the case with quantification from the outside of a predicate like noun phrase quantification.

It is never true either that the domain of quantification in predicate position is unrestricted. It is restricted to those individuals that exist during the time period which is determined by the tense particle which ends the sentence and the context of utterance. For example, take our old example (5) of a direct passive.

- (5) Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Taro was scolded.)

It may seem that there is no restriction to the domain of the hidden existential quantification, that is, the people who might have scolded Taro. Yet that there is a restriction will become clear when you try to change the period during which Taro's scolding is supposed to have taken place as in the following exchange.

- (E) X: Taro ga shika- rare- ta no?
 NOM scold PASSIVE PAST INTERROG
 Y: Iya.
 No
 X: Kyou de naku te kinou yo.
 today is not but yesterday I mean

¹⁰ The situation is exactly the same if we consider the negations of (30) and (35). (i) is a negation of (30), and (ii) is of (35).

- (i) Hanako wa hahaoya dewa nai.
 TOPIC mother is not
 (Hanako is not a mother.)
 (ii) Hanako wa dareka no hahaoya dewa nai.
 TOPIC somebody GEN mother is not
 (Hanako is not somebody's mother.)

Y: Sore nara sou da.
Then if so is.

(X: Was Taro scolded? Y: No. X: Not today but yesterday, I mean. Y: Then, he was.)

What happens here is that X changed the relevant period by explicit specification and thereby changed the domain of the hidden existential quantification. Perhaps this is not precise enough; as the domain of the quantification is determined to be those individuals which are involved in the events that happen in a given period, there is one more step in the process that leads to the change of the quantificational domain, namely, the change in the extent of the events that should be considered to be relevant. Thus, in order to change the domain of quantification involved in a direct passive, you have to first effect the change of the relevant period, which causes the change of the extent of the relevant events or states, which in turn leads finally to the desired change of the domain.

In contrast, if you wish to change the quantificational domain in the case of usual noun phrase quantification, you don't need to do that in such a roundabout way. You can change it immediately as you wish. What you should to do is just to say it.

Take (25). The following is an exchange starting with an utterance of (25).

(F) X: Dareka ga Taro o shikat- ta
somebody NOM ACC scold PAST
Y: Iya, daremo shikatte- inai.
No anybody scold not
X: Koko ni iru dareka de naku-
here LOC present somebody is not
te, hoka no dareka da.
and other GEN somebody is.

(X: Somebody scolded Taro. Y: No, nobody scolded Taro. X: Not by those present here, but by somebody else.)

In this exchange, X changed the domain supposed by Y by giving an explicit specification.

Similarly, it is not true either that the hidden quantification that is supposed to exist in the sentence

(30) Hanako wa hahaoya da.
TOPIC mother is
(Hanako is a mother.)

has an unrestricted domain. (30) may be true at some time, and false at another time. Suppose (30) is true if it is uttered now, but it was false if it was uttered ten years ago. What would be

the ground for judging (30) false when it was uttered ten years ago? It must have been that at that time there were no individuals whom Hanako was the mother of.

So, it is obvious that the domain of the quantification is restricted to the individuals that existed at that time of the utterance. If the domain were unrestricted, then (30) would be judged true even when it was uttered ten years ago because there exist Hanako's children in the unrestricted domain.

The phrase “hahaoya da” in (30) is a predicate that denotes a certain type of state, namely, the state of being a mother. A state predicate may apply to individuals in some time period and does not apply in another period. Hence, we may construe a state predicate as a predicate true of time intervals, while the individuals to which the state is ascribed will be treated as a sort of parameters as is the case with an event predicate¹¹.

Generalizing our remark in the previous section a little, we can say that the sentences we have been concerned with are the sentences which report some particular events or states and have the following structure.

$$\{(A_1, A_2, \dots, A_n)(P)\}t$$

A_1, A_2, \dots, A_n are called “adjuncts” and are either a noun phrase with a particle like “Hanako ga” or an adverbial phrase like “yukkuri” (slowly)¹². P is a predicate and it is either an event predicate like “shikaru” (scold) or a state predicate like “hahaoya da”. Finally, t is a tense marker like “ta”. Although a sentence may lack any adjunct, it must have a predicate and a tense marker; a predicate is the core of a sentence of this type and it gives us a type of event or state which it reports, and a tense marker anchors such a type to the real world by situating it in some particular period.

As we have seen, the influence to the predicate P of contextual information must come through a tense marker t . When a sentence is uttered, the time of its utterance and t determine a certain time period I ; for example, if t marks the past, then I is the period before the time of utterance. Usually, the period in question is much more restricted than I , and some further factors from the context will determine a part I' of I as the period in which the events or states that were talked about happen or hold. For example, take

¹¹ “hahaoya da” is an example of the so-called “predicate nominal”. There is a very important class of predicate nominals which apply to individuals whenever they exist. Examples of such predicate nominals are “inu da” (being a dog) and “mizu da” (being water). Note that “hahaoya da” is not one of them. You may wonder whether the predicate nominals like “inu da” and “mizu da” should be construed as state predicates whose semantic values are time intervals. To answer to it, we need a fuller account of predicate nominals.

¹² However, we have not considered any concrete example of the sentence with an adverbial phrase.

- (5) Taro ga shika- rare- ta.
 NOM scold PASSIVE PAST
 (Taro was scolded.)

The tense particle “ta” at the end indicates the events of scolding took place in the past. But when (5) is uttered, usually the reported events are not only in the past, but also in some particular part of the past, perhaps, the past which is not far from the present. Let I' be this part of the past. In this way, we can interpret the predicate part of the sentence as claiming there exist in the period I' some events or states of the type denoted by the predicate.

And, if there exists a quantification within the predicate part, then the domain of quantification is restricted contextually to those individuals that exist in I' . Still, it is much less restricted than the domain which is usually presupposed in noun phrase quantification. This feature of quantification in predicate position makes it very different from nominal quantification. In particular, it is the reason why quantification in predicate position seems to be much less sensitive to the changes of the context than nominal quantification.

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