Japanese Negative Polarity Items and Negative Concord

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1 Introduction

Negative polarity items (NPIs) are a class of expressions whose distribution is restricted to affective contexts, especially to the negative context (Kato (1985)). Examples of the expressions traditionally counted as Japanese negative polarity items are: *kessite* ('ever'), *nannimo* ('anything'), *daremo* ('anyone'), *dokomo* ('anywhere'), *tittomo* ('not at all'), and *sika* ('only') (Ikeya and Kawamori (1998))[1].

These items have conventionally been treated as belonging to one category, namely that of NPI, and explained in terms of same conceptual apparatuses. We will show, however, that these items do not constitute a monolithic, single category, but rather are to be grouped into two distinct categories – one comprising *sika*, the other composed of other NPIs.

We specifically show that Japanese NPIs other than *sika* is like negative phrases in negative concord sentences in such languages as non-standard English and Romance languages. We also show that *sika* is unlike other NPI items in several important respects. A feature-based account for syntax-semantics interface *sika* is presented that attempts to account for these points.

1.1 Properties of *sika*

In this subsecion, we focus on *sika* and review the properties that make it linguistically interesting, thus presenting what motivates this kind of study in the first place. There are several properties that make *sika* especially interesting.

Association with Negative *Sika* is always to be associated with overtly negative particles like *-nai* or *-nu*, *-zu*, *-mai*, and a negative-like adjective *dame*. We call this property of *sika*, in particular, and NPI in general, as *association with negative*, or AWN, for short. We think of AWN as a syntactic property. We will leave open exactly how this 'association' is to be defined, since it is not immediately quite relevant to our present purpose. We only suggest, however, that it is most likely that this association is to be realized as a certain kind of 'command' relation on syntactic representation.

This property, in fact, is the reason why these items are called 'negative polarity' in the first place, but we use AWN to make this particular property more salient and unambiguous.

There can be two types of items with AWN; one is the type that weakly requires negation to occur with it, or *weak AWN*, while the other type is that which strictly requires a negative element, or *strict AWN*. A weak AWN can omit the negative particle when the context allows it; a strict AWN must always have an associated negative particle.

sika always comes before the negative particle and the negative particle cannot be ommitted; it has to be always overt.

This is striking when one compares *sika* with other NPIs in Japanese. In the following example dialogues, the first three show that such NPIs as *tittomo*, *dokomo*, and *daremo* can occur without a negative particle and still have their NPI senses. The last example shows that it is not the case with *sika*. In the following the notation H% indicates that the sentence is realized with a rising intonation.

(1) A:Paateii omosirok-atta (H%) B:Tittomo
A: party fun-PAST B: At-all
A: 'Was the party fun?' B: 'Not at all.'

[1]Note that we use the phonemic romanization of Japanese scripts, so-called *Kunrei-siki*, according to which those sounds typically represented in English as *shi* and *chi* are written *si* and *ti*, respectively.

(2) A:Dokoka itta (H%) B:Dokomo
A: Somewhere go-PAST B: (Not) Anywhere
A: Did go anywhere? B: Nowhere.

(3) A:Dareka kita (H%) B:Daremo
A:Someone com-PAST B: (Not) anyone
A: Has someone come? B: No one.

(4) A:Dareka kita (H%) B:*Taro-sika
A:Someone come-PAST B: Taro-SIKA
A: Has someone come? B: 'Only Taro'

Negation Cancelling Interpretation The interpretation of a *sika* sentence always implies the logical contrary of its *sika*-less counterpart. The *sika*-sentence (5) logically implies sentence (7), which is the logical contrary of (6), the *sika*-less form of (5).

(5) taroo-sika gohan-o tabe-nai
Taroo-SIKA rice-OBJ eat-NEG
'Nobody but Taroo eats rice.'

(6) taroo-wa gohan-o tabe-nai
Taroo-TOP rice-OBJ eat-NEG
'Taroo does not eat rice.'

(7) taroo-wa gohan-o tabe-ru
Taroo-TOP rice-OBJ eat-ASSERT
'Taroo eats rice.'

This is in sharp contrast to other negative polarity items, such as *kessite* ('ever') and *nanimo* ('anything'); sentence (8) and sentence (9) each imply (6).

(8) taroo-wa kessite gohan-o tabe-nai
Taroo-TOP never rice-OBJ eat-NEG
'Taroo never eats rice.'

(9) taroo-wa nanimo tabe-nai
Taroo-TOP anything eat-NEG
'Taroo eats nothing'

We shall refer to this feature of as its *negation cancelation property* (NCP). Thus *sika* is similar to other NPIs in that it has AWN. *Sika* is different from other NPIs in that it has NCP. Notice that AWN is a syntactic property, whereas NCP is a semantic one.

Polymorphism *sika* can be used with any NP or PP.

Thus in the following sentence *sika* is attached to *sanzen* ('three bowls'), a noun phrase representing quantity:

(10) taroo-wa san-zen-sika gohan-o tabe-nai
Taroo-TOP one-bowl-SIKA rice-OBJ eat-NEG
'Taroo eats only three bowls of rice.'

while in the following it is attached to *iru-toki-ni* ('when she is around"), a post-positional phrase:

(11) Hanako-ga iru-toki-ni-sika Taroo-wa utaw-anai
Hanako-SUBJ be-when-AT-SIKA Taroo-TOP sing-NEG
'Taroo sings only when Hanako is around'

Let us call this property *polymorphism.*

Case-absorption *sika*, like *wa* can 'absorb' some case particles, like *ga* and *o*.

Compare the following (12) with (6) above.

(12) taroo-wa gohan-sika tabe-nai
Taroo-TOPIC rice-SIKA eat-NEG
'Taroo eats nothing but rice.'

In both sentences, *gohan* ('rice') is the object of the verb *tabe-* ('eat'). This fact is shown clearly in (6) above by the accusative case marker *o*, as in *gohan-o*. In (12), in which *sika* is attached, however, the accusative case marker is not explicitly expressed, but rather, so to speak, 'absorbed' by *sika*.We call this property *case-absorption*.

Unbounded association *sika* and the negative particle can be separated from each other by any number of constituents, as are demonstrated by the following examples; the *sika* constituent *Taro-sika* is separated from its corresponding negative constituent *tabe-nai* by no constituent (13), a noun phrase (14), and a complex noun phrase with a modifying clause (15).

(13) Taro-sika ringo-o tabe-nai
Taro-SIKA apple-OBJ eat-NEG
'Only Taro eats an apple.'

(14) Taro-sika ookina-kemusi-no iru ringo-o tabe-nai
Taro-SIKA big-worm-be apple-OBJ eat-NEG
'Only Taro eats an apple which a big worm is in'

(15) Taro-sika kasikoi-tori-kara kakureta ookina-kemusi-no iru ringo-o tabe-nai
Taro-SIKA wise-bird-from hiding big-worm-be apple-OBJ eat-NEG
'Only Taro eats an apple which a big worm that is hiding from a wise bird is in'

In particular, *sika* construction can embed another *sika* construction, as can be seen in the following:

(16) Taro-sika[1] Ken-ga eigo-sika[2] ie-de hanas-anai[2] koto-o sir-anai[1]
Taro-SIKA Ken-SUBJ English-SIKA house-at speak-NEG fact-OBJ know-NEG
'Only Taro knows that Ken speaks only English at home'

Taro-sika is interpreted as associated with *sir-anai*, hence the same superscript, while the internally embedded *eigo-sika* is interpreted as associated with *hanas-anai*.

These properties we have cited constitute a reasonable justification for the study on *sika*, for these properties are clearly nonn-trivial and possibly challenging, if not problematic, for theoretical linguistics, from conceptual as well as computational point of view. A theory of *sika* must at least account for some of these properties. We will in this paper focus on the first two properties, namely AWN and NCP.

2 Previous Studies

In this section, we review the two most influential studies on *sika* hitherto presented, and show that they are not totally satisfactory.

Muraki (1978), one of the first serious attempts to tackle the problem of Japanese NPI in the framework of transformational-generative grammar, treated *sika* ... *nai* as a unit one-place predicate taking a complement sentence. To distribute *sika* and *nai* to appropriate positions Muraki must have recourse to such transformational operations as Predicate Raising, *sika-nai* Lowering, and Predicate Restructuring.

For example, sentence (17)

(17) John *sika* biiru o noma nai.
John only beer Obj drink not
Only John drinks beer.

has the following derivational process.

a. [John ga biiru o numu] sika-nai
⇒ b. [John ga sika]biiru o [nomu nai]
⇒ c. John sika biiru o nomanai.

Since Muraki treats *sika* sentence as invariably derived from a base form with *sika-nai* taking the whole sentence as a complement, in order to differentiate the sentence like (18) from (17),

(18) John ga biiru sika noma nai.
John Nom beer SIKA drink not
John drinks nothing but beer.

one has to have a means to associate the predicate *sika-nai* with the constituent where the *sika* will eventually land after the *sika-nai* lowering. This seems like a reverse problem of AWN, but it is essentially a semantic problem – the association would determine the interpretation of the whole sentence.

This shows that Muraki's account confuses two different issues – one semantic and the other syntactic – and seems to be a rather ad-hoc solution.

Another of the problems in Muraki's treatment is that in his framework such a simple sentence as

(19) John ni wa tairyoku sika nai.
John LOC TOP physical strength SIKA not
'John has nothing but physical strength'

cannot be generated since, again, Muraki treats *sika-nai* as a one-place predicate taking a sentence as an argument.

Whatever the nature of such operations as *sika-nai* lowering and predicate-lowering, Muraki's theory has to account for some of the facts cited in the introduction, and it does not seem to be so successful in doing so.

The theory of NPI presented in Kato (1985) can be roughly summarized as follows:

1. An NPI is licensed in a S-structure iff it is in a negative domain
2. A negative domain is c-commanded by NEG
3. It is closest to NEG and α is closest to β if β is in the first potential licensing position.
4. An unlicensed NPI is illegitimate at LF.
5. At S-structure Japanese subjects are within a V's projection, while English subjects are Infl's projection.

The notion of c-command has two kinds of difficulties: one is that the configurational notion is so coarse that it must be restricted somehow; the other is that it is too restrictive to cover a relevant domain for an NPI. Thus in (20), NEG can c-command not only *hon* 'a book' but also *kareno* (his), *otootono* (brother's) and *kareno otooto no* (his brother's).

(20) [John wa] [[kare-no otooto-no hon-o] [yom-anai.]]
John Nom his brother's book-Obj read-not
John does not read his brother's book.

Unless some restriction is imposed, we would have the following two ungrammatical sentences (21) and (22).

(21) *[John wa] [[kare-no sika otooto-no hon-o] [yom-anai.]]
John Nom his only brother's book-Obj read-not
John does not read his brother's book.

(22) *[John wa] [[kare-no otooto-no sika hon-o] [yom-anai.]]
John Nom his brother's only book-Obj read-not
John does not read his brother's book.

As it is pointed out in Kato (1985), c-command will predict that a NEG in *siranai* can c-command both of the *sika* phrases in a sentence. Hence a wrong association of a *sika* phrase and NEG will result.

(23) Taroo wa [Jiroo ga uisukii sika nom-anai koto] sika sir-anai.
Taroo-Top Jiroo-Nom whisky only drink-not fact only know-not
Taroo knows nothing other than that Jiroo drinks nothing other than whisky.

As has been shown above, the previous studies on *sika*, though they are succesful to some extent in capturing the intuition regarding *sika*, are not entirely satisfactory. The most problematic aspects in those studies are the lack of clear conecptual demarcation of the two different categories — *sika* and other NPIs — and the lack of syntax-semantics interface, one of the consequences of the neglect of syntax-semnatics distinction.

3 Negative Concord

Negative concord is a set of phenomena, found not only in non-standard English but also in such Romance languages as Italian and Catalan, in which negative expressions are used more than once to emphasize the negative interpretation. The following are examples from non-standard English, (24) and (25), and from Italian, (26).

(24) Nobody said nothing.
'Nobody said anything.'

(25) Maria didn't say nothing to nobody.
'Maria didn't say anything to anybody.'

(26) Mario non ha parlato di niente con nessuno
Mario not has spoken about nothing with nobody
'Mario hasn't spoken with anyone about anything'

An important thing to note about negative concord is that, as can be seen from (24), the logical double negation reading does not exist. In order to state this fact more precisely, let us define the notation for polarity.

1. An atomic proposition A has the positive polarity; we show this as $pol(A) = +$, or A^+.
2. Given a proposition φ that has the positive polarity, namely φ^+, its negation $\psi := \neg\varphi$ has the negative polarity; we represent this as $pol(\psi) = -$, or ψ^-;

Using this notation, we can state
the principle of double negation:

> Given a proposition with the negative polarity φ^-, its negation $\psi := \neg\varphi$ has the positive polarity, namely ψ^+.

This principle of double negation implies that $\neg\neg\varphi$ and φ have the same polarity, and so do $\neg\neg\neg\varphi$ and $\neg\varphi$. In other words, the polarity "flip-flops" depending on whether the number of negations is even or odd.

In a sentence with negative concord, this principle does not apply. This fact can be restated more formally in the following manner:

Suppose a negative concord sentence σ has the form

(27) $[_\sigma \ldots \nu_1 \ldots \nu_m \ldots]$,

where each $\nu_i, 1 \leq i \leq m$, is a negatively marked NP.

Suppose $\alpha_1, \ldots, \alpha_m$ are some non-negatively marked NPs.

The interpretation of the result of substituting $\alpha_1, \ldots, \alpha_m$ for ν_i in σ will be represented as:

(28) $[\![\sigma]\!]([\![\alpha_1]\!], \ldots, [\![\alpha_m]\!])$.

Then a sentence with negative concord has the following property:

(29) $pol([\![\sigma]\!]) = pol(\neg[\![\sigma]\!]([\![\alpha_1]\!], \ldots, [\![\alpha_m]\!]))$,

regardless of m; it never flip-flops.

Notice that only one of the negatively-marked elements is the semantically potent negation, real negation, while the other negatively-marked NPs are interpreted as existentially quantified, NPI elements.

The properties of negative concord can be summarized thus:

NC1 negative concord is correlation between a negation expression and one or more negatively marked NPs. *i.e.* No affective context other than negation is involved.

NC2 only one of the more than two negatively marked elements is the 'real' negation; no logical double negation interpretation exists (or negation cancellation, in our terminology).

NC3 the non-'potent' elements in negative concord are interepreted as existentially quantified; in other words they are given NPI readings.

3.1 NPI and negative concord

Since Japanese lacks negative determiners, negative concord, by definition, never occurs; Japanese has no lexical counterparts of negative NPs like 'nobody', 'nothing', *etc.* But Japanese NPIs show some similarity to negative concord.

Parallel to what has been observed about negative concord above, Japanese NPIs have the following properties:

JNPI1 Many Japanese NPIs are correlated with a negation expression. *i.e.* No affective context other than negation is involved.

JNPI2 one negation can license more than two NPIs and there is no negation cancellation.

JNPI3 the NPIs are interepreted as existentially quantified

Observe that in (30), in which NPI *daremo* occurs, has a negative polariy.

(30) daremo tiketto-o kaw-anak-atta
anybody ticket-OBJ buy-NEG-PAST
'Nobody bought a ticket'

In our polarity notation, this means $(daremo(S))^-$, where S stands for (the meaning of) *tiketto-o kaw-anak-atta.*

(31) daremo kessite tiketto-o kaw-anak-atta
anybody ever ticket-OBJ buy-NEG-PAST
'Nobody ever bought a ticket'

In our polarity notation, this means $(kessite(daremo(S)))^-$.

(32) daremo kessite nanimo iw-anak-atta
anybody ever anything say-NEG-PAST
'Nobody ever said anything'

Again, in our polarity notation, this means $(nanimo(kessite(daremo(S))))^-$, whose logical interpretation can be rendered as

$$\neg(\exists x)(\exists y)(\exists z)[\Phi(x,y,z)],$$

where $\Phi(a,b,c)$ stands for 'a says b at time c'. Notice that there is only one logical negation, whereas there are three existential quantifiers corresponding to the three NPIs *daremo*,*kessite*, and *nanimo*. These sentences together demonstrate that the properties JNPI2, JNPI3 are indeed possessed by Japanese NPIs.

In this respect, *sika* is quite different from other NPIs. *sika* cannot occur with another NPI noun phrase; for example, the following, where *sika* and NPI *daremo* occur, is ungrammatical:

(33) * daremo tiketto-sika kaw-anak-atta
anybody ticket-SIKA buy-NEG-PAST
'Nobody bought only a ticket'

Similarly for:

(34) *daremo kessite tiketto-sika kaw-anak-atta
anybody ever ticket-SIKA buy-NEG-PAST
'Nobody ever bought only a ticket'

That the coocurrence of *sika* and an NPI is responsible for the ungrammaticality is made more salient by the following (34), whos only difference from the grammatical (32) is thatit has *sika* in place of *o*.

The following, on the other hand, in which positive polarity item *daremo-ga* occurs with *sika*, is grammatical.

(35) daremo-ga tiketto-sika kaw-anak-atta
anybody-SUBJ ticket-SIKA buy-NEG-PAST
'Everybody bought only a ticket'

These examples show that *sika* cannot 'share' a negation; while other NPIs can, as can be seen from (30) through (32), share one negation. It should also be noted that *sika* construction can never be regarded as a case of negative concord because of NCP, namely the logical double negation.

The following emerge as tentative ovservation:

1. *sika* is 'greedy' with respect to negation; once *sika* is licensed by a negation, other NPIs cannot use the negation as the source of NPI licensing.

2. NPIs other than *sika* are like 'holes' with respect to negation; even when one NPI is licensed by a negation, the negation can go on to license other NPIs in its domain.

3. Negative expressions relevant to NPIs are lexically determined; items that are semantically downward entailing are not necessarily negative expressions relevant to NPIs unless lexically so marked.

It is natural to assume that 1 and 2 above are based on semantically motivated properties. The fact that *sika* cancells negation and a *sika* sentence has a logical double negation interpretation *sika* adds something to semantic interpretation, interpretation even related to logical inference. This suggests that *sika* needs a negation to 'complete' its meaning.

Other NPIs, on the other hand, adds nothing logical, as far as polarity is concerned, to the sentence they are in. They may indicate the point or context of emphasis, but they never change the polarity of the sentence.

4 Syntax-Semantic Interface of NPI and *Sika*

4.1 Monotonicity Marking and Negative Polarity

The context of NPIs is often explained in terms of the following

Licensing Hypothesis (Ladusaw)

> The sentence $S[npi]$ is grammatical if and only if $S[X]$ is downward monotone (or downward entailing) in X.

In this definition, downward entailment can be redefined as monotone decreasing. This property can be formally defined as:

> An operator O is monotone decreasing iff it allows the following inference:

$$\frac{O(\varphi) \quad \psi \rightarrow \varphi}{O(\psi)}$$

Dowty Dowty (1994) based his theory of NPIs on this hypothesis and extends it to include an account for negative concord. In the following, $\uparrow$M and $\downarrow$M indicate 'monotone increasing' and 'monotone decreasing', respectively.

Dowty's NPI hypothesis

> Given that (i) $\uparrow$M and $\downarrow$M inferences are a very significant pattern of natural language reasoninig, and (ii) the distribution of NPIs (and NCs) is (almost) coextensive with logically $\downarrow$M contexts, we can hypothesize theat one important reason for the existence of NPI and NC marking is to directly mark positions syntactically which are subject to $\downarrow$M inferences. (Dowty (1994)).

Dowty explains AWN of NPIs by developing an extended categorial grammar with monotonicity-marked syntactic categories. His categorial grammar is extended with monotonicity-marked syntactic categories:

1. NP(= type e), S (type t), and CN (type (e,t)) are primitive categories;
2. If A and B are categories, so is A/B;
3. If A/B is a category, so are $A+/B+$, $A+/B-$,$A-/B+$, and $A-/B-$;
4. Parallel definitions for $B \setminus A$.

Since one and the same word can appear with positive polarity in one derivationand negative polarity in another, most lexical items will, in this formulation, be entered in two categories, though with the same semantic interpretation.

He then defines slash-elimination rules (functional appliation rules):

Polarity-preserving elimination

$$\frac{(A+/B+) \qquad B+}{A+} \qquad \frac{(A-/B-) \qquad B-}{A-}$$

Polarity-reversing elimination

$$\frac{(A+/B-) \qquad B-}{A+} \qquad \frac{(A-/B+) \qquad B+}{A-}$$

His account of AWN is then formulated by the following constraint:

NPIs are enterned only in '$-$'-marked categories.

Thus **any** is assigned to $(S-/VP-)/CN-$ and **ever** is assigned to $VP-/VP-$.

The obvious problem with his account is that it has so many extensively ramified types or categories. Do we really need all those categories? In short, one can ask 'Why can't a simple feature checking be a better choice?' In the following, we answer "yes, we can".

4.2 Feature-based account of *sika*

In this section, we present our account of the behavior of *sika*, using the information-, or feature-, based formalism. Our account attempts to incorporate the following desiderata for such an account.

- Avoid ramification of types and categories.
- Reflect the intuitions captured in monotonicity marking.
- Implement 'command' constraints.

In the following, we sketch the relevant parts of our fragment of the grammar.

4.2.1 Feature System

Our feature system has a feature **polarity** whose value is either $-$ or $+$; the $-$ value means the negative polarity, which we represent as [+NEG], whereas the $+$ value means the positive polarity, which is represented as [–NEG]. Naturally, we assume that *nai* has the negaitve polarity, [+NEG][2].

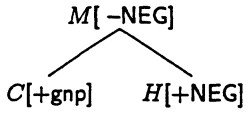
Our feature system also assumes that each lexical item contains a feature for polarity sensitivity. We represent this feature as **pol-sens**. This feature takes one of four values: {undef,–neg, +neg, +gnp}. The default value is undef, undefined; most lexical items have the pol-sens feature undefined. This is reasonable because most lexical items can occur in negative as well as positive contexts. A lexical item whose pol-sens value is – neg requires there not be a negative in its environment. Such a lexical item is called a positive polarity item (PPI). The pol-sens value +neg is what NPIs have.

The value gnp stands for "greedy negative polarity". This feature value accounts for the unique behavior that *sika* presents as opposed to other NPIs. "greedy negative polarity" is controled by the following rule:

[2]Thus [+NEG] is an abbreviation of [polarity –].

GNP absorption

The following is a well-formed structure (tree):



In othre words,

In the construction:

C[+gnp] H[+NEG],

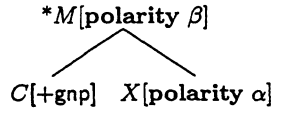
Mother's **polarity** feature takes the value +, i.e. [−NEG].

This rule accounts for only one side of *sika*; it accounts for NCP and the greediness of *sika*'s association with negation. But it does not account for AWN itself.

AWN would be accounted for by the following constraint. It states that +gnp value appearing without an accompanying negation, that is a polarity value + or undef, results in an non-well-formed feature structure.

AWN constraint on gnp

The following is not a well-formed feature structure (tree):



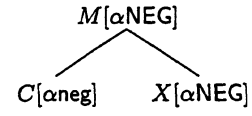
where X is either V or A whose **subcat** values contain C, α other than $-$, and β any of the three values.

This constraint, together with GNP absorption above, in effect states that in order for the construction C[+gnp] ... H[+NEG] to be well-formed, the command relation, such as is defined in Pollard and Ivan (1994), need hold between *sika* and its licenser.

The usual NPIs other than *sika* and PPIs follow the following:

Consistency Constraint on neg

If X is either V or A and its **subcat** values contain C, then it must be the case that



where and α is either + or $-$.

Notice that this constraint is referring to only one C constituent. Depending on the exact analysis of verb phrase and sentence structure, it may be necessary to generalize this constraint to include multiple C's. In this paper, we simply assume that Japanese has a stratified verb phrase rather than flatly concatenated noun phrases and verb.

4.2.2 System at Work

We present a fragment Japanese that exemplifies the working of our grammar presented in the previous subsection. The following are the example lexical items demonstrating the feature system introduced above. We only show the features relevant to the current concern; the exact nature of the details of the feature structures will depend on other factors which are not our current concern.

4.2.3 Example Lexicon

1. An example of a PPI:

$$\begin{bmatrix} \textbf{phon} & /\text{naN-demo}/ \\ \textbf{synsem} & \begin{bmatrix} \textbf{cat} & \begin{bmatrix} \textbf{head} & \text{noun} \\ \textbf{subcat} & \{\} \\ \textbf{pol-sens} & -\text{neg} \end{bmatrix} \\ \textbf{contents} & \ldots \end{bmatrix} \end{bmatrix}$$

2. An example of a NPI:

$$\begin{bmatrix} \textbf{phon} & /\text{daremo}/ \\ \textbf{synsem} & \begin{bmatrix} \textbf{cat} & \begin{bmatrix} \textbf{head} & \text{noun} \\ \textbf{subcat} & \{\} \\ \textbf{pol-sens} & +\text{neg} \end{bmatrix} \\ \textbf{contents} & \ldots \end{bmatrix} \end{bmatrix}$$

3. Feature structure of *nai*:

$$\begin{bmatrix} \textbf{phon} & /\text{nai}/ \\ \textbf{synsem} & \begin{bmatrix} \textbf{cat} & \begin{bmatrix} \textbf{head} & \text{affix} \\ \textbf{subcat} & \ldots \end{bmatrix} \\ \textbf{contents} & \begin{bmatrix} \textbf{polarity} & - \\ \textbf{pred} & \ldots \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

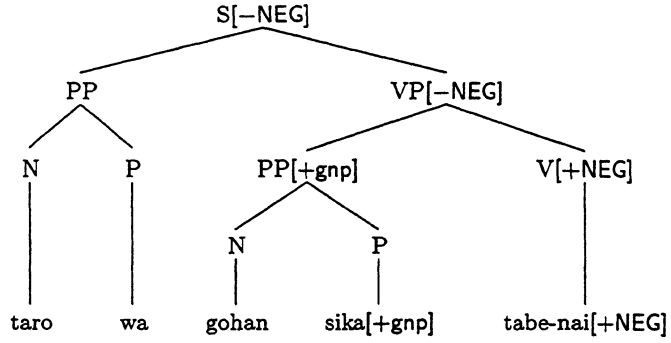
4. Feature structure of *sika*:

$$\begin{bmatrix} \textbf{phon} & /\text{sika}/ \\ \textbf{synsem} & \begin{bmatrix} \textbf{cat} & \begin{bmatrix} \textbf{head} & \text{postposition} \\ \textbf{subcat} & \{\text{PP} \parallel \text{NP}\} \\ \textbf{pol-sens} & \text{gnp} \end{bmatrix} \\ \textbf{contents} & \ldots \end{bmatrix} \end{bmatrix}$$

Notice that *sika* is subcategorized using the disjunctive feature value, {PP||NP}; this accounts for its polymorphic character.

4.2.4 Example Sentences

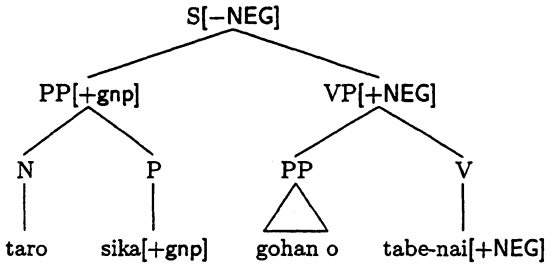
Now we can show that our grammar associates a proper feature structure to sentence (12), which we have seen above:



Sentence (36), which is slightly different from (12),

(36) taroo-sika gohan-o tabe-nai
Taroo-SIKA rice-OBJ eat-NEG
'Only Taroo eats rice.'

is given the following structure and analyzed as well-formed, which is exactly what we want.

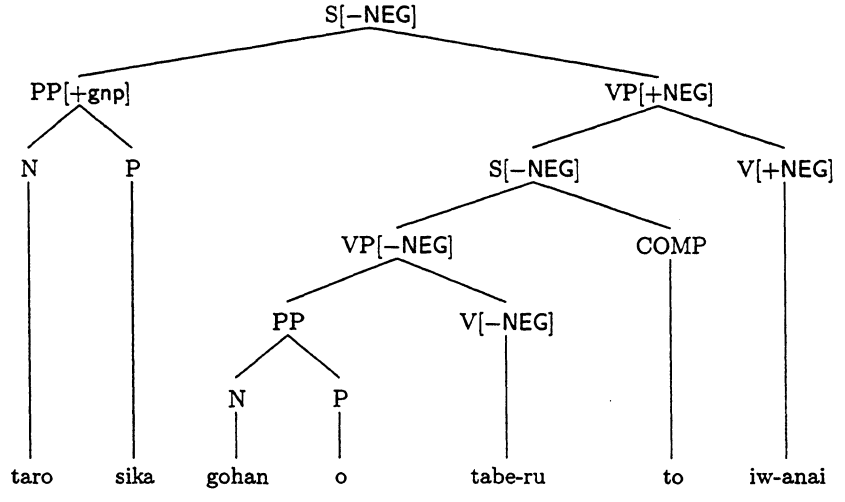


These demonstrate how GNP absorption accounts for the well-formedness of simple *sika* sentences and for their NCP.

A more complex example involving an embedded sentential complement is the following sentence.

(37) taroo-sika gohan-o tabe-ru to iw-anai
Taroo-SIKA rice-OBJ eat COMP say-NEG
'Only Taroo says (he) eats rice.'

This sentence is given the following feature strucure:

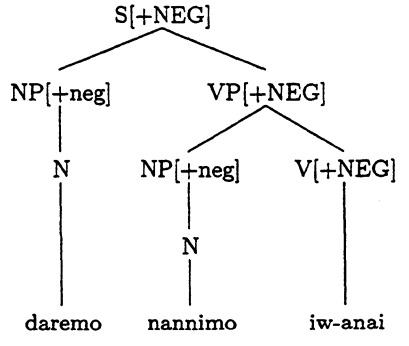


Notice that this sentence has the positive polarity ([−NEG]) even thogh the whole sentence is in negative, as its main predicate is *tabe-nai.*

The feature value [+neg], which characterizes NPIs other than *sika*, is exemplified by the following sentence,

(38) daremo nannimo iw-anai
nobody nothing say-NEG
'Nobody says anything'

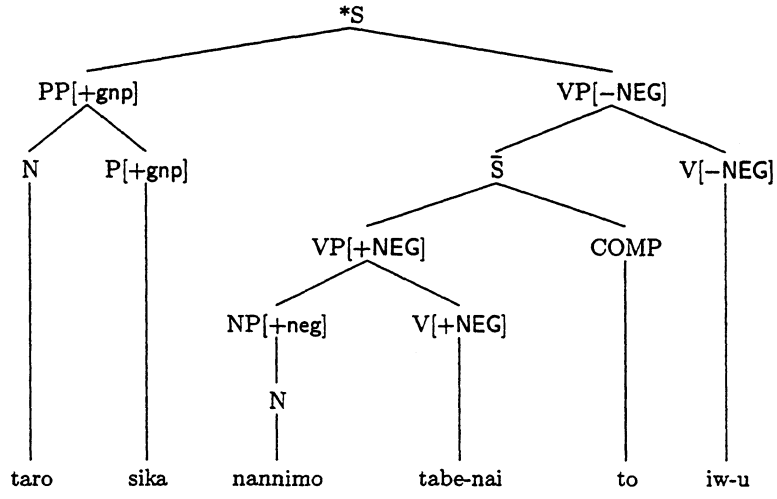
to which the following structure is assigned by our grammer:



The following sentence, on the other hand, shows that a proper structural analysis is necessary for a correct account of *sika.*

(39) taroo-sika nannimo tabe-nai to iw-u
Taroo-SIKA nothing eat-NEG COMP say
'Only Taroo says (he) eats nothing.'

This sentence is given the following feature structure, which is ungrammatical because it violates the AWN constraint:



Notice that the embedded sentence "*nannimo tabe-nai* (eats othing)" is observing the *neg* consistence constraint and is therefore well-formed. This example shows that AWN constraint, though it may seem rather innocently formulated, in fact does the work it is supposed to do.

5 Conclusion

We have looked at negative polarity items in Japanese. We specifically looked at *sika* and claimed that it is different from other Japanese NPIs. We have shown that Japanese NPIs other than *sika* is very like negative phrases in negative concord sentences in such languages as non-standard English and Romance languages. We have also shown that *sika* is unlike these NPIs in that it has NCP, and that it is 'greedy' with respect to negation. We touched on Dowty's account of NPIs and suggest that Japanese NPIs are not amenable to his treatment. His account is shown to be problematic in that it assumes proliferation of categories. We developed a feature-based account for syntax-semantics interface *sika*, in which these facts are taken into account.

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