

Prosody and information in Japanese and English

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0. Introduction

In this paper, I will discuss an interesting parallelism between English prosody and the topic/nominative marker alternation in Japanese. I will argue that these seemingly separated phenomena are governed by the same information structure of the sentence, not by the semantic distinction between individual-level and stage-level predicates as argued in Selkirk (1995).*

1. English prosody and stage/individual-level predicates

1.1 Obligatory pitch accents on individual-level predicates in English

Let us first look at the examples in (1) and (2). Selkirk (1995), citing Gussenhoven (1983, 1992), argues that stage-level predicates don't have to have a pitch accent as in (1a) while individual-level predicates must have a pitch accent, as the unacceptability of (2a) shows:

- (1) a. Your EYES are red.
b. Your EYES are RED. [stage-level predicate]
- (2) a. * Your EYES are blue.
b. Your EYES are BLUE. [individual-level predicate]

The predicate *are red* in (1) expresses a temporary fact about the hearer's eyes. So *are red* is a stage-level predicate and doesn't have to have prominence as in (1a). On the other hand, *are blue* is a permanent fact about the hearer's eyes. So *are blue* is an individual-level predicate and must have a pitch accent as in (2b).

Another set of similar examples are given in (3) and (4):

- (3) a. FIREMEN are available.
b. FIREMEN are AVAILABLE. [stage-level predicate]
- (4) a. * FIREMEN are altruistic.
b. FIREMEN are ALTRUISTIC. [individual-level predicate]

Be available is a stage-level predicate about *firemen*, and doesn't have to have a pitch accent as

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in (3a). *Be altruistic* is an individual-level predicate about *firemen*, and must have an pitch accent as shown in (4a) and (4b). The summary of the patterns is shown in (5):

- (5) a. SUBJ (stage)pred * SUBJ (individual)pred
 b. SUBJ (stage)PRED SUBJ (individual)PRED

1.2 Counterexamples: Individual-level predicates without pitch accent

However, there are counterexamples to the claim that pitch accents are obligatory on individual-level predicates. No accent on individual-level predicates is acceptable in some cases, as shown in (6):

- (6) SUBJ (individual)pred

Let us consider the following examples:

- (7) Adam (upon first seeing Eve): Your EYES are blue!
 Eve: PARDon?
 Adam: Your EYES! They're BLUE! I LOVE blue! (Gussenhoven 1983:396)
- (8) A: What's Mary's biggest problem?
 B: The fact that JOHN drinks. (Gussenhoven 1992:103)
- (9) A: Why didn't you come here by car?
 B: The ROAD is bad! (Jäger 1997:234)
- (10) a. I LOVE California because its CLIMATE is so nice. (attested)
 b. I can't READ much of THINGS like that anyway cos my EYES are too bad. (London-Lund Corpus)

In (7) through (10), the predicates in question are all individual-level predicates, but they don't have pitch accents in the given context, like *your EYES are blue*, *the fact that JOHN drinks*, *the ROAD is bad*, *it's CLIMATE is so nice*, and *my EYES are too bad*. These predicates don't express temporary situation about the subjects. Gussenhoven (1992) observes that the "individual-level predicates are used to express the novel discovery or novel disclosure of permanent qualities, i.e. are used as stage-level predicates" in (7) and (8). However, it seems difficult to interpret these predicates as stage-level predicates. Then we need to look for another generalization to explain all the data (1) to (4) and (7) to (10).

2. Japanese topic/nominative alternation

2.1 Unacceptable nominative marker for the subject of individual-level predicates

Let's turn to Japanese topic/nominative alternation. The Japanese counterparts of (1) through (4) are (11) through (14), respectively:

- (11) a. (Anata-no) me-ga akai.
 you-Gen eyes-Nom red
 b. (Anata-no) me-wa akai. [stage-level predicate]
 you-Gen eyes-Top red

- (12) a. * (Anata-no) me-ga aoi.
you-Gen eyes-Nom blue
- b. (Anata-no) me-wa aoi. [individual-level predicate]
you-Gen eyes-Top blue
- (13) a. Shoobooshi-ga shutsudoo-dekiru
firemen-Nom go-can
- b. Shoobooshi-wa shutsudoo-dekiru [stage-level predicate]
firemen-Top go-can
- (14) a. * Shoobooshi-ga ritatekida.
firement-Nom altruistic
- b. Shoobooshi-wa ritatekida [individual-level predicate]
firemen-Top altruistic

Notice that this paradigm of acceptability is parallel to the acceptability of (1) through (4) in English. Both the nominative marker (-*ga*) and the topic marker (-*wa*) are fine for the subject of stage-level predicates, as in (11a) and (11b), and (13a) and (13b). But the nominative marker (-*ga*) is unacceptable in the sentences which have individual-level predicates, as in (12a) and (14a). The subjects of individual-level predicate must be marked with the topic marker as in (12b) and (14b). The pattern of acceptability is summarized in (15):

- (15) a. subj-Nom (stage)pred * subj-Nom (individual)pred
b. subj-Top (stage)pred subj-Top (individual)pred

If you compare (15) to (5), it is clear that there is parallelism between English prosody and Japanese subject-marking. The English sentences with pitch accents only on the subjects, like (5a), corresponds to the Japanese sentences with the nominative marker (-*ga*), like (15a). The English sentences which have pitch accents both on subjects and predicates, like (5b), corresponds to Japanese sentences with the topic marker (-*wa*), like (15b). Individual-level predicates in (5a) and (15a) are unacceptable.

2.2 Acceptable nominative marker for the subject of individual-level predicates

The parallelism between English prosody and Japanese nominative/topic alternation also holds in the examples we saw in section 1.2. That is, we have (16) which corresponds to (6):

- (16) subj-Nom (individual)pred

The examples (17) through (20) are the Japanese parallels to the English (7) through (10):

- (17) Adam (...): Me-ga/*wa aoi!
eyes-Nom/Top blue

Eve: Nani?
what

Adam: Me-da-yo! Aoi-nda! Boku-wa ao-ga suki!
eyes-it's-Part blue-it's I-Top blue-Acc love

- (18) A: Mary-no saidaino mondai-wa nani?
Mary-Gen biggest problem-Top what
- B: John-ga/*wa nomu-koto(-da).
John-Nom/Top drink-fact-it's
- (19) A: Naze kuruma-de kokoni konakatta-no?
why car-Instr here came not-Q
- B: Michi-ga/*wa warui(-kara(-da))!
road-Nom/Top bad-because-it's
- (20) a. California-ga suki, kikoo-ga/*wa totemo ij-kara
California-Nom love climate-Nom/Top so nice-because
- b. Son-na-no-wa yom-e-nai, me-ga/*wa warui-kara.
That-like-things-Top read-can-Neg eyes-Nom/Top bad-because

In these sentences, the nominative marker (*-ga*) appears in spite of the fact that the predicates are individual-level ones. Please notice that the topic marker (*-wa*) is not acceptable in these sentences.

So we have parallel patterns shown in (5) and (6) in English and (15) and (16) in Japanese. These patterns tell us that stage/individual distinction doesn't explain either English or Japanese data. It is clear that we need another distinction.

3. Topic/non-topic unit

3.1 Thetic/categorical judgments and topic/non-topic units

Let us move on to section 3. It is well known that Japanese topic/nominative alternation is governed by the information structure of the sentence. The correspondence between English prosody and Japanese topic/nominative alternation gives an evidence that English prosody is governed by the information structure. In this section, I will argue that the clauses with pitch accents only on the subject have only a non-topic unit, and that the clauses with pitch accents both on the subject and predicate have a topic unit and a non-topic unit.

Kuroda (1972, 1992) argues that the difference between thetic and categorical judgments are reflected in Japanese by the particles *-wa* and *-ga*, attached to the subject. His definition of thetic and categorical judgments are (21a) and (21b):

- (21) a. *Thetic* judgments: ... simply express recognition of the existence of an entity or a situation. ... a simple form of a judgment, a unitary cognitive act. ... a simple judgment.
- b. *Categorical* judgments: ... conform to the Subject-Predicate form ... two distinct cognitive acts, one the recognition of the Subject, ..., and another the act of acknowledging or disavowing a Predicate of a Subject. ... a double judgement.

In other words, a thetic clause doesn't have a topic while a categorical clause has a topic. I would like to introduce here the terms, *topic unit* and *non-topic unit*. A thetic clause consists of a non-topic unit because there is no topic in it. A categorical clause consists of a topic unit and a non-topic unit. I will use parenthesis () to show a topic unit, and braces { } to show a non-topic unit, as shown in (22a) and (22b):

- (22) a. thetic: { non-topic }
 b. categorical: (topic) { non-topic }

(23a) and (23b) are Kuroda's examples ofthetic and categorical judgments:

- (23) a. {Neko-ga asokode nemutte iru} [thetic]
 cat-Nom there sleeping be
 'A cat is sleeping there'
- b. (Neko-wa) {asokode nemutte iru} [categorical]
 cat-Top there sleeping be
 'The cat is sleeping there' (Kuroda 1992:21)

In (23a) the speaker finds a cat sleeping there and expresses his recognition as a simple judgment. In (23b), on the other hand, the speaker first recognize the cat and then describe about it with the predicate "is sleeping there".

Following Kuroda, Sasse (1987) explains the examples like (24) by thethetic/categorical distinction:

- (24) a. {The BUTer melted} [thetic]
 b. (The BUTter) {MELTed} [categorical]
(cf. Chafe 1974:115, Sasse 1987:520)

He argues that "subject accentation signals communicative fusion of an element denoting an individual and an element denoting an event, while double accent signals communicative separation" of those elements.

If we translate (24a) and (24b) into Japanese, the topic marker *-wa* and the nominative marker *-ga* are appropriate, as shown in (25a) and (25b):

- (25) a. {Bataa-ga toketa} [thetic]
 butter-Nom melted
- b. (Bataa-wa) {toketa} [categorical]
 butter-Top melted

3.2 Explanation of the data

Let us go back to the example sentences we saw in section 1 and 2. Please look at (26):

- (26) a. {Your EYES are red} (1a) {...-Nom ...} (11a) [thetic]
 b. (Your EYES) {are BLUE} (2b) (...-Top) {...} (12b) [categorical]

The acceptable examples without accent on the predicate such as (1a) and (3a) arethetic clauses, because the speaker notices the fact that the hearer's eyes are red at that time in (1a) or reports the fact that firemen are available at that time in (3a). On the other hand, sentences like (2b) and (4b) are categorical in that the speaker is commenting on the topics *your eyes* and *firemen*, like *they are blue* and *they are altruistic*. The distinction is supported by the Japanese data. The nominative marker (*-ga*), which occurs in athetic clause, is used in (11a), which corresponds to (1a). The topic marker (*-wa*), which occurs in a categorical clause, is used in (12b), which corresponds to (2b).

Now let us think about the examples (7) through (10). I repeat these as (27) to (30) here. First let us consider (7) repeated as (27):

(27) Adam (upon first seeing Eve): { Your EYES are blue!} [thetic]

(27) is an expression of the speaker's surprise. He finds the fact that Eve's eyes are blue, and utters this sentence. He doesn't mean to convey the information about her eyes to the hearer Eve. In that sense (27) is a thetic clause. Remember that the corresponding Japanese sentence (17) has the nominative marker *-ga*.

(8) is a slightly different case. We can argue that the speaker B's answer has a covert subject and copula as shown in italics:

(28) A: What's Mary's biggest problem?
 B: (*Mary's biggest problem*) {*is* the fact that JOHN drinks }

Then the whole sentence (28B) has a categorical structure, but the overt part, *the fact that JOHN drinks*, is contained in a non-topic unit. In Japanese (18B), the nominative marker *-ga* is used, and moreover the sentence final particle *-da* (it's) is added. This fact seems to support the idea that (8B) has a covert subject and copula as shown in (28B). We can deal with the examples (9) in the same way:

(29) A: Why didn't you come here by car?
 B: (*I didn't come here by car*) {*because* the ROAD is bad! }

B's answer has the covert main clause, and the overt rationale clause, *the ROAD is bad*, is contained in a non-topic unit.

Then (30a) and (30b) are straightforward. They have a main clause and a rationale clause, and both of them are overt:

(30) a. (I LOVE California) {because its CLIMATE is so nice}
 b. (I can't READ much of THINGS like that anyway) {cos my EYES are too bad}

Each clause corresponds to a topic and a non-topic unit, and the underlined part is contained in a non-topic unit. Please remember again that all the Japanese sentences (17) through (20), parallel to (27) through (30), have the nominative marker (*-ga*).

Now let us think about the rest of the cases shown in (31):

(31) a. (Your EYES) {are RED} (1b) (...-Top) {...} (11b) [categorical]
 b. * (Your EYES) {are blue} (2a) *(...-Nom) {...} (12a) [categorical]

(31a) has a categorical structure. The speaker first present the topic, *your EYES*, then gives a comment about it, *are RED*. So in Japanese (11b), the topic marker *-wa* is used. (31b) is the unacceptable case which needs explanation. The sentence *your eyes are blue* is a categorical sentence except in the context like (27). The speaker presents a topic and then comments on it. So it has a topic unit and a non-topic unit as shown in (31b). I think the reason why (31b) is unacceptable is that it violates the functional constraints given in (32a) and (32b):

(32) a. A non-topic unit cannot be under-focused with no pitch accent in English.

- b. A topic unit cannot be marked (or over-focused) with the nominative marker *-ga* in Japanese.

We also need another constraint (33):

- (33) *-wa* marks a unit only if the unit is a topic unit.

Because as we saw in section 2.2, the topic marker *-wa* cannot occur in the cases like (34B):

- (34) A: Mary-no saidaino mondai-wa nani?
 Mary-Gen biggest problem-Top what
- B: (*Mary-no saidaino mondai-wa*) {John-ga/*wa nomu-koto-da}
 Mary-Gen biggest problem-Top John-Nom/Top drink-fact-it's

In (34B), *John* itself is not a topic unit. It is a part of a non-topic unit. So the topic marker *-wa* in (17) through (20) violates the constraint (33) because the topic marked element is not a topic unit.

4. Summing up

To sum the arguments so far, we have seen that Individual-level predicates can appear without pitch accents in English, and argued that English prosody as well as Japanese topic/nominative alternation depends on the topic/non-topic distinction, and not on the stage/individual distinction.

I have not discussed Korean data, but Korean shows similar alternation of topic marker *-un* or *-nun* and nominative marker *-ga* or *-i*. I haven't talked about Focus Projection, either. But along the idea presented here, I think we can dispense with Focus Projection argued in Selkirk (1995) among others. I will leave these topics for future research.

5. Unaccusative/unergative verbs

Before we discuss the prosody in Japanese, let us look at another distinction argued in Selkirk (1995). Unaccusative verbs don't need pitch accent on them, while unergative verbs need pitch accent:

- (35) a. JOHNSON died. (unaccusative)
 b. JOHNson DIED (Selkirk 1995:559)
- (36) a. *JOHN was dancing. (unergative) (Heycock 1994:159)
 b. JOHN was DANCING.

The paradigm of acceptability is the same as that of stage/individual-level distinction, as we saw in (1) to (4) in section 1.1. I would like to generalize these cases to the examples we have seen. (37) is another pair of typical examples of unaccusative verbs.

- (37) a. The SUN's shining.
 b. The SUN is SHINING.

6. Japanese prosody

6.1 Unergative/unaccusative verbs

Now let us turn to the Japanese prosody. Hirotani (1997) shows experimental data and

argues that unaccusative/unergative distinction doesn't hold in Japanese. Unergative verbs have pitch prominence as in English (cf. 36):

- (38) maGO-ga oYOida-no. (unergative)
 grandchild-Prt swam-Nml
 'My grandchild swam.'

As for unaccusatives, however, some verbs (of appearance, arrival, and so on) don't have pitch prominence as (39a) and others need pitch accents as (39b):

- (39) a. maGO-ga umareta-no. (unaccusative, appearance)
 grandchild-Prt born-Nml
 'My grandchild was born.'
- b. oMAwarisan-ga naKUNATTA-no (unaccusative)
 policeman-Prt died-Nml
 'A policeman died.' (Hirotani 1997:29f.)

She concludes that Selkirk (1995)'s theory doesn't work in Japanese.

I agree with her observation about the examples above. Let us consider another kind of phenomenon. Japanese has initial lowering on unaccented words if the words are the initial ones in Minor Phrases (cf. Selkirk and Tateichi 1988, 1991). I will show lowered moras in bold face:

- (40) a. **K**odomo-ga umareta. (unaccusative, appearance)
 child-Prt was born
 'A child was born.'
- b. **K**odomo-ga **n**akunatta. (unaccusative)
 child-Prt died
 'A child died.'

Umareta doesn't have initial lowering while the first mora of *nakunatta* is lowered. This shows that (40a) has one Minor Phrase while (40b) has two Minor Phrases.

Next, let us look at unergative verbs more carefully. Initial lowering doesn't occur in some cases as (41):

- (41) a. **T**ori-ga naiteru. (unergative)
 birds-Prt singing
 'Birds are singing.'
- b. **T**ori-ga naiteru-n-da.
 birds-Prt singing-Nml-it's
 'It's birds singing.'

(41a) is the sentence the speaker utters in the bed when he wakes up in the morning. The speaker doesn't see the birds singing. (41b) is an appropriate answer to the question "what's that noise?" The speaker doesn't see the birds singing in this case, either.

(41b) is called *noda*-sentence in Japanese syntax. Sugahara (1998:2) shows the following examples with pitch prominence on the unergative verb:

- (42) uMA-ga oYOideru-n(o)-da. (Sugahara 1998:2)
horse-Prt swimming-*no*-Copula
‘A horse is swimming.’

I believe that this observation is correct, but let us look at other examples:

- (43) a. KOi-ga oyoideru-n-da.
carp-Prt swimming-Nml-it’s
‘It’s carp swimming.’
b. **s**akana-ga oyoideru-n(o)-da.
fish-Prt swimming-Nml-it’s
‘It’s fish swimming.’

If the subjects of the verb ‘swim’ are carp or fish, the verb doesn’t have pitch prominence and doesn’t have initial lowering as in (43a) and (43b). *Noda* sentences seem to have a small clause as the complement of *noda*. Consider the following examples with small clauses:

- (44) a. maGO-ga oyoida-no-o uTSUshita. (unergative)
Grandchild-Prt swam-Nml-Acc took-a-picture-of
‘I took a picture of my grandchild swimming.’
b. **K**odomo-ga warau-no-o kiita. (unergative)
child-Prt laugh-Nml-Acc heard
‘I heard a child laugh.’

In (44a), the unergative verb ‘swim’ doesn’t have pitch prominence. In (44b), initial lowering doesn’t occur on the first mora of the unergative verb. These facts show that there is no (Major and Minor) phrase boundary between the subject and the verb in the small clause. The purported generalization that unergative verbs have pitch prominence or make a separate prosodic phrase doesn’t hold in these cases. We will try to explain these examples in section 6.3

6.2 Stage/individual-level predicates (*thetic/categorical*)

Let us turn to the stage/individual-level distinction. Hirotani (1997) observes that both kinds of predicates have pitch prominence in Japanese:

- (45) a. ME-ga aKAI-no. (stage-level)
eyes-Prt red-Nml
‘(His) eyes are red.’
b. ME-ga kuROi-no. (individual-level)
eyes-Prt black-Nml
‘(His) eyes are black.’ (Hirotani 1997)

However, if we look at initial lowering in these sentences, there is no initial lowering on stage-level predicate in *thetic* clauses while initial lowering occurs on individual-level predicates in *categorical* sentences:

- (46) a. **K**ao-ga akai. (thetic)
face-Prt red
‘(Your) face is red.’

- b. **Ku**chibiru-wa akai. (categorical)
 lips-Prt red
 ‘Lips are red.’

Then we can argue that there is no phrase boundary in thetic clauses while there is a phrase boundary in categorical clauses.

Notice also that neither stage-level nor individual-level predicates need to have pitch prominence if the clauses are embedded in other clauses:

- (47) a. ME-ga akai-no-wa HOn-o yonda-kara-da. (stage-level)
 eyes-Prt red-Nml-Prt book-Acc read-because-it’s
 ‘The reason why my eyes are red is that I read books.’
- b. ME-ga warui-kara yoMENai. (individual-level)
 eyes-Prt bad-because can’t read
 ‘I can’t read it because my eyes are bad.’

We can argue that this is because the underlined part is included in a topic unit in (47a) and in a non-topic unit in (47b). The constraint (32a), proposed for English, seems to apply in Japanese as well. In both of (47a) and (47b), the underlined part has one pitch prominence, and that is enough for the satisfaction of the constraint (32a) which prohibits no pitch accent in a non-topic unit.

6.3 Thetic/categorical judgments revisited

Let us reconsider the thetic/categorical distinction to explain the data of Japanese prosody we saw above. The idea of the thetic/categorical judgement, in fact, is first proposed by Franz Brentano and elaborated by Anton Marty, as Kuroda (1972:154) points out. Nakajima (1939) also introduced the idea into linguistics. The important point is that the original distinction of the thetic/categorical judgement by Brentano and Marty is not exactly the same as Kuroda’s. To show the difference, let us look at some examples. For Brentano and Marty, the typical thetic judgements are existential and impersonal sentences as (48) (cf. Kuroda 1972:154):

- (48) a. Esregnet. (impersonal)
 it rains
 ‘It rains.’
- b. Esgibt gelbe Blumen. (existential)
 it giveyellow flowers
 ‘There are flowers.’

Notice that these sentences don’t have the usual subject + predicate form. Categorical clauses, on the other hand, have the subject + verb form as you see in their examples:

- (49) a. Der Körper ist auf der Erde.
 the body is on the earth
 ‘The body is on the earth.’
- b. Ich urteile. (cf. Kuroda 1972:154)
 I judge
 ‘I judge.’

Returning to Kuroda’s example of thetic judgement in (23a), it has the subject + predicate form and

he gives the English translation which has the subject + predicate form:

- (23) a. {Neko-ga asokode nemutte iru} [thetic]
cat-Nom there sleeping be
'A cat is sleeping there'

As Kuroda points out, however, the subject + predicate form is not natural for existential sentences in English. The English language prefers expletive subjects construction (50b) to avoid the subject + predicate form (50a):

- (50) a. ?A cat is sleeping there.
b. There is a cat sleeping there. (Kuroda 1992:24)

To avoid the subject + predicate form for existential (or appearance) sentences is also seen in Chinese. In Chinese, the subjects are placed after the verbs if the verbs describe the subjects' existence or appearance:

- (51) a. Xia yu le.
fall rain Perf
'It rained.'
b. Lai le san ge ren.
comePerf three person
'There came three men.'

The verbs of appearance and those of disappearance show different behaviors. In Chinese, the sentence "The rain stopped" has the normal subject + verb word order unlike the inversion case (51a). Expletive constructions in English are good with the verbs of appearance, but not with those of disappearance:

- (52) a. There appeared a ship on the horizon.
b. ? There disappeared a ship on the horizon. (cf. Levin 1993:89)

Considering Brentano and Marty's original idea ofthetic/categorical judgement, the appearance verbs are 'pure'thetic in the sense that it describe the fact that a thing comes into the context. The verbs of disappearance, on the other hand, are not 'pure'thetic, because they describe the fact that a thing ceases to exist in the context. We will refer to non-purethetic clauses as semi-thetic clauses.

Then we can explain the prosodic difference between (39a) and (39b), and between (40a) and (40b). The verb *umareta* (was born) in (39a) and (40a) is an appearance verb, and the clause containing it is a purethetic clause. The whole clause should be contained in a unit because it is a simple judgement. Thus *umareta* has no pitch prominence and no initial lowering as we expect in the cases of one prosodic phrase. The verb *nakunatta* (died) is a disappearance verb, and the clauses (39b) and (40b) are semi-thetic. Their subject and verb are more likely to be separated and to make their own units than purethetic clauses. Thus *nakunatta* has pitch prominence and initial lowering because of a prosodic boundary in front of it.

To summarize, we have three kinds of judgement, pure-thetic, semi-thetic, and categorical. We could call the second semi-categorical judgement. I would like to call it semi-thetic, however, because we can keep Kuroda's idea that Japanese *-ga* appears inthetic clauses:

- (53) a. **Tori-ga** naiteru. (purethetic)
 bird-Prt singing
 ‘(I hear/It’s) birds singing.’
 b. **Tori-ga** tondeiru. (semi-thetic)
 bird-Prt flying
 ‘Birds are flying.’
 c. **Tori-wane**mutteiru. (categorical)
 Bird-Prtsleeping
 ‘The birds are sleeping.’

In (53b), I underlined the first mora of the verb to show that initial lowering is likely to occur. If we try to classify the sentences into the three kinds of judgement, we have the following classification:

- (54) a. purethetic: (39a) (40a) (41) (43) (46a) (48) (50b) (51) (52a)
 b. semithetic: (38) (39b) (40b) (42)? (50a)
 c. categorical: (46b) (49)

I admit that there are some difficult cases to decide. We could allow some grades between these types, but I will not go into this matter any further. Instead we will argue how we can formalize the idea of judgement types and topic/non-topic units in the next section.

7. Formalization

7.1 Bare mapping from syntax to PF

In Tokizaki (1999), I proposed a rule of mapping from syntax to PF:

- (55) Interpret boundaries of syntactic constituents [...] as prosodic boundaries / ... /.

The rule (55) maps the syntactic structure (56a), for example, into the PF representation (56b):

- (56) a. [[X] [[Y] [Z]]]
 b. // X /// Y // Z ///

Then (56b) is changed by the phrasing rule (57) into one of the phrasing patterns shown in (58):

- (57) Delete n boundaries between words. (n : a natural number)

- (58) a. / X // Y / Z // ($n=1$) --> (X) (Y) (Z)
 b. X / Y Z / ($n=2$) --> (X) (Y Z)
 c. X Y Z ($n=3$) --> (X Y Z)

I argued there that the input to the mapping rule (55) should be the bare phrase structure, like (59b), but not the standard X-bar theoretic phrase structure, like (59a):

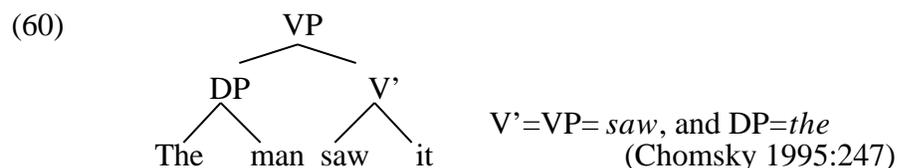
- (59) a. b.
 (Chomsky 1995: 246)

Then how can we express the difference betweenthetic and categorical clauses if they consist of only a subject and a verb as (53a) and (53c)?

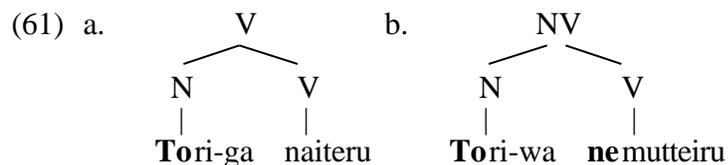
7.2 Merge and Concatenate

One possible answer to the question above is to try to find the way to express the distance of the constituents to be merged. The basic idea is that the constituents inthetic clauses are close to each other, but those in categorical clauses are not. I would like to introduce a new operation Concatenate in addition to Merge. Concatenate put two constituents together but still keeps the original status of them. In other words, neither of the constituents project, or we could say that both of them project.

In Chomsky (1995), either one of the constituents merged projects like *saw* and *the* in (60):



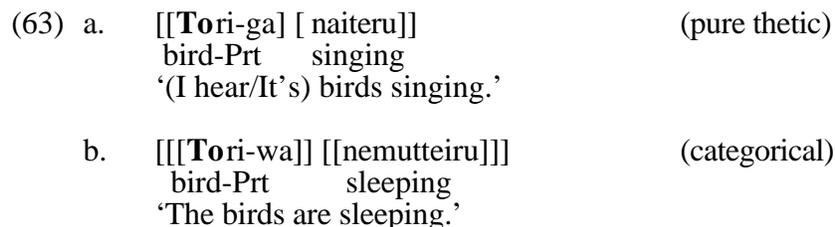
In this case, *the* is connected tightly with *man*, and *saw* with *it*. This is true with the N and V inthetic clauses. They are connected tightly to each other. Compared tothetic clauses, the N and V in categorical clauses are more separated even if they make a constituent. I would like to call the loosely connected case Concatenate and express it as in (61b):



Concatenate picks up two items in the Numeration, and makes a constituent, NV, which is not a projection of one of the items, and just a combination of two items. If we have Concatenate (61b) as well as Merge (61a), we need some way to express its structure by bracketing. In fact, it seems difficult to do it, but let us assume that Concatenate makes another pair of brackets around the items to be concatenated. Then we have (62b) for Concatenate and (62a) as Merge:



Now thethetic and categorical clauses have the structure (63a) and (63b):



The rule (55) maps the syntactic structures (63a) and (63b) into the phonological representations (64a) and (64b), respectively.



- b. /// **Tori-wa** /// **ne**mutteiru ///

If we apply the phrasing rule (57) with $n=2$, we get no phrase boundary in thethetic (65a) and two boundaries in the categorical (65b) between the subject and the object:

- (65) a. **Tori-ga** naiteru ($n=2$)
 b. / **Tori-wa** // **ne**mutteiru / ($n=2$)

Thus we correctly predict that initial lowering occurs on the verb in (63a) but not in (63b).

Appendix

I will add some comments to the above discussion. First, we haven't looked at simple sentences which are longer than the sentences containing only a subject and a verb. We can argue that the following sentences arethetic, because they report an event like (63a) and can be the first sentence of a news report:

- (66) a. {A SPECTATOR killed a JUDGE with a HAMMER}(Bing 1981:16)
 b. Kenbutsunin-ga saibankan-okanadzuchi-de koroshita
 spectator-Prt judge-Acc hammer-Instr killed

(66a) and (66b) can be the first sentence of a news report. In this sense, they arethetic clauses because they report an event like (63a). However, these sentences have some prosodic phrases because there are more than two pitch accents or lowered initial moras. This fact shows that (66a) and (66b) are somewhat categorical. I would like to say that they are semi-thetic because of the semantic and prosodic reasons.

Second, I presented a generalization (32a) to the effect that non-topic unit cannot be underfocused with no pitch accent in English. How about topic-units? (67a) shows that topic-units don't have to have pitch accent:

- (67) a. (It) {'s TRUE}
 b. Sore-wa hontoo-da
 it-Prt true-be

In (67a), the topic-unit consists of a pronoun and doesn't have pitch accent.

Third, our approach does not need Focus Projection assumed in Selkirk (1995) among others. The following sentence is ambiguous between event reading and generic reading, but shows different prosodic patterns:

- (68) a. TRESpassers will be prosecuted. (event)
 b. TRESpassers will be PROsecuted. (generic) (Selkirk 1995:553)

Selkirk (1995) assumes that the structures of (68a) and (68b) are (69a) and (69b), respectively.

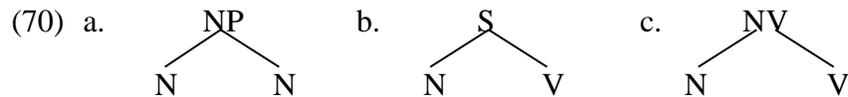
- (69) a. TRESpassers_i will be procecuted t_i .
 b. TRESpassers_i will be PRO_i PROsecuted t_i .

According to her theory, in (69a), the pitch accent on the subject marks Focus on it, and Focus is transmitted from the subject to its trace to project to the whole predicate. Thus the whole sentence (69a) is F-marked. She stipulates that PRO doesn't inherit Focus from the coindexed element. Then the verb must have pitch accent in order to F-mark the whole sentence (69b) (See Selkirk

1995 for detail).

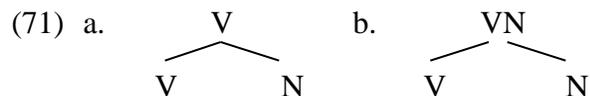
In our approach, we don't need these assumptions to differentiate these cases. (68a) is athetic clause which consist of only one non-topic unit, and it is acceptable if there is a pitch prominence in it according to (32a). Of course we have to discuss why pitch accent falls on the subject, not on the verb nor on the copula. We will not go into detail here, however. (68b) has a categorial meaning because the subject and the verb have pitch accent of their own.

Finally, let us think about some consequences of Concatenate I introduced in 7.2. The basic idea of the distinction between Merge and Concatenate is similar to that between endocentric and exocentric constructions by Bloomfield (1933, 1984:194). He argues that NPs like *poor John* are endocentric because *John* and *poor John*, on the whole, have the same function. On the other hand, sentences like *John ran* are exocentric because *John ran* is neither *John* nor *ran*. Then we can argue that Merge makes NPs, and Concatenate makes Ss. Probably we can also give an explanation to the problem of Korean Obstruent Voicing which I mentioned in Tokizaki (1999). Cho (1990) argues that in Korean, Obstruent Voicing applies between N and N in (70a), but not between N and V in (70b):



In bare phrase structure theory (70a) and (70b) are not different in phrase structure. If we assume (70c) as the structure of sentences, however, we can expect a prosodic boundary between N and V in (70c) and no boundary between N and N in (70a).

Another consequence of Concatenate is that it allows us to deal with the semantic difference of some V-NP combinations. In some VPs, V and NP are closely connected, and in others the connection is rather loose. We can express the former VPs as Merge (71), and the latter VPs as Concatenate (71b):



The bracket notation of these structure would be (72a) and (72b), respectively:



We then predict that prosodic boundaries are more likely inserted between N and V in the loose connection case (72b) than the tight connection case (72a). The data of pitch prominence (cf. Hirotsu 1997) and initial lowering in Japanese show that this is the right prediction:

- (73) a. B₁iru-o non₁da.
 beer-Acc drank-Nml
 'I drank beer.'
- b. B₁iru-o NA₁geta.
 beer-Acc drank-Nml
 'I threw a beer can.'

- (74) a. **te**gami-o wata**shi**ta
 letter-Acc handed
 ‘I handed a letter (to her).’
- b. **te**gami-o **moyashi**-ta
 letter-Acc burned
 ‘I burned a letter.’

Drinking beer in (73a) and handing a letter in (74a) are usual combination of N and V, while throwing a beer can in (73b) and burning a letter in (74b) are not. We can argue that (73a) and (74a) are the VP made by Merge (71a) and that (73b) and (74b) are the VP made by Concatenate (71b). The verb *nonda* doesn’t have pitch prominence in (73a) while *nageta* has pitch prominence in (73b). The first mora of *wata**shi**ta* is not lowered in (74a) while that of *moyashi*ta is lowered in (74b). These facts show that there is a prosodic boundary between N and V in (73b) and (74b), and not in (73a) and (74a).

References

- Bing, Janet Mueller. 1981. The given/new distinction and the unmarked stress pattern. *NELS 11*, 13-21.
- Bloomfield, Leonard. 1933, 1984. *Language*. Chicago: The University of Chicago Press.
- Chafe, Wallace L. 1974. Language and consciousness. *Language* 50, 111-133.
- Cho, Young-Mee Yu. 1990. Syntax and phrasing in Korean. In *The phonology-syntax connection*, ed. Sharon Inkelas and Draga Zec, 47-62. Chicago: The University of Chicago Press.
- Chomsky, Noam. 1995. *The minimalist program*. Cambridge, Mass.: MIT Press.
- Diesing, Molly. 1992. *Indefinites*. Cambridge, Mass.: MIT Press.
- Gussenhoven, Carlos. 1983. Focus, mode and the nucleus. *Journal of Linguistics* 19: 377-417.
- Gussenhoven, Carlos. 1992. Sentence accents and argument structure. In *Thematic structure: Its role in grammar*, ed. I.M. Roca, 79-106. Berlin: Foris.
- Heycock, Caroline. 1994. Focus projection in Japanese. *NELS 24*, 157-171.
- Hirotani, Masako. 1997. Sentence prosody in Japanese. MA thesis, Tokyo University.
- Jäger, Gerhard. 1997. The stage/individual contrast revisited. *WCCFL 15*, 225-239.
- Kuroda, S.-Y. 1972. The categorical and the thetic judgement. *Foundations of Language* 9: 153-185.
- Kuroda, S.-Y. 1992. *Japanese syntax and semantics*. Dordrecht: Kluwer.
- Nakajima, Fumio. 1939. *Imiron*. (Semantics) Tokyo: Kenkyusha.
- Onoe, Keisuke, Hideki Kimura, and Yoshiki Nishimura. 1998. Nijuu-shugo-to sono shuuhun (double subjects and their related topics). *Gengo* 27, vol. 11: 90-108.
- Sasse, Hans-Jürgen. 1987. The thetic/categorical distinction revisited. *Linguistics* 25: 511-580.
- Selkirk, Elisabeth. 1995. Sentence prosody: Intonation, stress, and phrasing. In *The handbook of phonological theory*, ed. John A. Goldsmith, 550-569. Cambridge, Mass.: Basil Blackwell.
- Sugahara, Mariko. 1998. Syntax and semantics of the Japanese *no-da* construction. Handout for the talk given at the University of Massachusetts, Amherst.
- Tokizaki, Hisao. 1998. Prosodic phrasing and bare phrase structure. Paper presented at NELS 29.

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