Prosody of Positive and Negative Conjunctions

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Abstract

In this paper, we discuss how the semantics of conjunctions affects prosody across clauses/sentences. Nespor and Vogel (1986) observe that phonological rules across sentences may apply when there exists a positive semantic relation (i.e., *and, therefore, because*) between two sentences.

The question is whether a positive semantic relation universally helps to join two prosodic domains. We conducted experiments to see whether this is the case in English and Japanese. The result shows that in English, a positive semantic relation helps to join two prosodic domains, but a negative semantic relation does not. However, the data show that in Japanese, a positive semantic relation does not help to join two prosodic domains any more than a negative semantic relation. In fact, in Japanese, two prosodic domains were more detached in the examples of positive semantic relations than in those of negative semantic relations. We discuss syntactic brackets, word/morpheme status of conjunctives and the semantic closeness of negative relations.

1. Introduction

In this paper, we discuss how the semantics of conjunctions affects prosody across clauses/sentences. Nespor and Vogel (1986) observe that

phonological rules across sentences may apply when there exists a positive semantic relation (*and, therefore, because*) between two sentences. For example, Flapping may apply between sentences in (1a), but not in (1b) which has two sentences in a negative semantic relation (*but, or*).

(1) a. [$_U$ It's late] [$_U$ I'm leaving] →
[$_U$ It's la[ɾ] I'm leaving]
b. [$_U$ It's late] [$_U$ I'm not leaving though] →
* [$_U$ It's la[ɾ] I'm not leaving though]

In (1b), the second sentence has a negative *though*, which expresses its negative semantic relation to the first sentence.[1] Assuming that phonological rules may apply in the domain of a single *U* (Phonological Utterance), Nespor and Vogel argue that a positive semantic relation is a condition on *U* restructuring joining adjacent *U*s into a single *U*. U restructuring occurs in (1a) with a positive semantic relation, and not in (1b) with a negative semantic relation. Similarly, Nespor and Vogel (1986) show that linking-*r* and intrusive-*r* may appear in sentences with a positive semantic relation, as shown in (2a) and (3a), but not in those with a negative semantic relation, as shown in (2b) and (3b).

(2) a. Where's Esther? I need her. (Esthe[r])
b. Where's Esther? I'm not in a hurry, though. (*Esthe[r])
(3) a. You should call Anna. It's late. (Anna[r])
b. Finish your pasta. I'll eat it otherwise. (*pasta[r])

[1] We could use the term 'adversative' instead of 'negative' to show the semantic relation between two sentences in examples like (1b). However, we will follow Nespor and Vogel (1986) in using 'negative' in order to avoid using the unfamiliar term 'unadversative' for 'positive'.

These examples demonstrate that a positive semantic relation helps to join two prosodic domains in English. The question is whether this is universally true in any languages. We conducted experiments to see whether this is the case in Japanese as well as in English by measuring pause length and pitch difference between clauses/sentences. The result shows that in English, a positive semantic relation helps to join two prosodic domains, but a negative semantic relation does not. However, the data show that in Japanese, a positive semantic relation does not help to join two prosodic domains any more than a negative semantic relation. In fact, in Japanese, two prosodic domains are more detached in the examples of positive semantic relations than in those of negative semantic relations.

In Section 2, we describe the procedure of our experiments. Section 3 shows the results of the experiments. In Section 4, we discuss the reasons for the prosodic difference between English and Japanese. Section 5 concludes with a discussion of some remaining tasks and problems in researching this area.

2. Experiments

2.1. Procedure

We would like to investigate the prosody between two clauses/sentences in Japanese. However, Japanese does not have phonological changes between clauses/sentences, such as Flapping in English. The juncture between two clauses/sentences can appear as a pitch reset in the second clause/sentence in both Japanese and English. The pitch difference is between the last mora/syllable in the first clause/sentence and the first

syllable/mora in the second clause/sentence. The bigger the pitch difference, the more separated are the two clauses/sentences.

We conducted experiments as follows. Six English speakers and sixteen Japanese speakers were asked to read some printed sentences. We analyzed seven pairs of English examples and four pairs of Japanese examples, each of which consisted of two clauses (C)/sentences (S) in a positive/negative semantic relation, the second clause/sentence starting with an accented/unaccented word in the Japanese examples. In each pair of sentences, (a) has a positive semantic relation and (b) has a negative semantic relation.

(4) Japanese Test Sentences:

[J1] a. *Atsukatta-node nama-o nonda.* (C2: Accented)
hot-was-because draft-Acc drank
'As it was hot, I drank draft beer.'

b. *Samukatta-noni nama-o nonda.*
cold-was-though draft-Acc drank
'Though it was cold, I drank draft beer.'

[J2] a. *Yasukatta-node momo-o tabeta.* (C2: Unaccented)
cheap-was-because peach-Acc ate
'As it was cheap, I ate a peach.'

b. *Takakatta-noni momo-o tabeta.*
expensive-was-though peach-Acc ate
'Though it was expensive, I ate a peach.'

[J3] a. *Anohito-wa yoku yatta-yo. Misu-shinakatta-ne.*(S2: Accented)
that person-Top well done-Prt miss-did-not-Prt
'He did well. He made no mistakes.'

b. *Anohito-wa yoku yatta-yo. Misu-shita-kedo-ne.*
that person-Top well done-Prt miss-did-though-Prt
'He did well. He made mistakes, though.'

[J4] a. *Osoku-natta-ne. Nemuku-natta-yo.* (S2: Unaccented)
late-became-Prt sleepy-got-Prt
'It's late. I got sleepy.'

b. *Osoku-natta-ne. Nemuku-nai-kedo.*
late-became-Prt sleepy-not-though
'It's late. I'm not sleepy, though.'

(5) English Test Sentences:

[E1] a. The temperature was high. I drank beer.
b. The temperature was low. I drank beer, though.

[E2] a. The price was low. I bought a lot.
b. The price was high. I bought a lot, though.

[E3] a. I did it OK. I made no mistakes.
b. I did it OK. I made some mistakes, though.

[E4] a. It's almost two. I got sleepy.
b. It's almost two. I'm not sleepy, though.

[E5] a. It's late. I'm leaving. (la[ɾ])
b. It's late. I'm not leaving, though. (*la[ɾ])

[E6] a. Where's Esther? I need her. (Esthe[r])
b. Where's Esther? I'm not in a hurry, though. (*Esthe[r])

[E7] a. You should call Anna. It's late. (Anna[r])
b. Finish your pasta. I'll eat it otherwise. (*pasta[r])

Test sentences in English [E1]-[E4] are designed to correspond to Japanese sentences [J1]-[J4] in their meanings, respectively. We also tested

the sentences [E5]-[E7] in order to check the prosody of the examples (1)-(3) taken from Nespor and Vogel (1986), which are claimed to have a phonological change only in the positive connection of two sentences.

We calculated pause duration and the pitch difference between the last mora/syllable of the first clause/sentence (C1/S1) and the first mora/syllable of the second clause/sentence (C2/S2). This is schematically shown in (6a) for Japanese and (6b) for English, where the pause duration between μ_1/σ_1 and μ_2/σ_2 and the pitches of μ_1/σ_1 and μ_2/σ_2 are measured. The pitch difference between the high μ_3 and the initial low μ_2 is also calculated for the Japanese in (6a).

(6) a.$[_{C1/S1}$ ... $\mu_1]$ $[_{C2/S2}$ μ_2 ...]

b.$[_{C1/S1}$ ... $\sigma_1]$ $[_{C2/S2}$ σ_2 ...]

In (6), the pause length between μ_1/σ_1 and μ_2/σ_2 and the difference in pitch between μ_1/σ_1 and μ_2/σ_2 (μ_2/σ_2 minus μ_1/σ_1) are calculated.

3. Results

We found that in English, the two sentences are more separated from each other if they are in a negative semantic relation (e.g. *but, though*) than in a positive semantic relation (e.g. *and, therefore*). The pause duration between σ_1 and σ_2 is longer in negative relations than in positive relations in Test Sentences [E1], [E2], [E3], [E6] and [E7], with a statistical significance of $p<0.05$. The average pause length is shown in (7), where statistically insignificant data [E4] and [E5] are shown in italics.

(7) Average pause length (sec.)

[E1] a. 0.42
b. 0.52
[E2] a. 0.30
b. 0.43
[E3] a. 0.34
b. 0.47
[E4] a. 0.43
b. 0.49
[E5] a. 0.29
b. 0.34
[E6] a. 0.24
b. 0.42
[E7] a. 0.19
b. 0.36

The pitch differences between σ_1 and σ_2 are also wider in negative relations than in positive relations in [E6], with $p<0.05$, which shows that pitch reset at the beginning of C2/S2 is more complete in negative relations than in positive relations.

(8) Average pitch difference between σ_1 and σ_2 (Hz): σ_2-σ_1 (pitch reset)

[E1] a. 12.17
b. 33.26
[E2] a. 6.13
b. 28.94
[E3] a. 23.60
b. 17.14

[E4] *a.* *24.68*
b. *14.78*
[E5] *a.* *5.68*
b. *10.88*
[E6] a. -10.75
b. 36.77
[E7] *a.* *18.72*
b. *39.31*

Pitch reset is more complete in negative semantic relations (b) than in positive semantic relations (a), except in [E3] and [E4]. This result, with pause and pitch reset, is what we expect given the phonological observation by Nespor and Vogel (1986), shown in (1)-(3), i.e., a negative semantic relation makes two clauses/sentences more separate from each other.

However, our data showed that the Japanese prosody was the opposite of the English. In other words, two sentences were more separate from each other if they were in a positive semantic relation (e.g. *and, therefore*) than in a negative semantic relation (e.g. *but, though*). First, the pause duration between μ_1 and μ_2 was shorter in a negative relation than in a positive relation in Test Sentences [J1] and [J4], with statistical significance $p<0.05$.

(9) Average pause length (sec.)
[J1] a. 0.14
b. 0.07
[J2] *a.* *0.10*
b. *0.09*

[J3] *a.* *0.35*

b. *0.32*

[J4] a. 0.41

b. 0.19

Although the difference between positive (a) and negative (b) in Test Sentences [J2] and [J3] was not statistically significant, the average pause length was a little longer in positive (a) than in negative (b). Second, the pitch difference between μ_1 and μ_2 was also wider in positive relations than in negative relations in [J3], with $p<0.05$, which shows that pitch reset at the beginning of C2/S2 is more complete in a positive relation than in a negative relation.

(10) Average pitch difference between μ_1 and μ_2 (Hz): $\mu_2-\mu_1$ (pitch reset)

[J1] *a.* *30.50*

b. *32.26*

[J2] *a.* *6.24*

b. *2.21*

[J3] a. 43.92

b. 19.96

[J4] *a.* *-3.19*

b. *-3.83*

Average pitch differences vary from [J1] to [J4]. However, we take [J3] as the representative result in Japanese prosody because this is the only statistically significant data.

Thus, Japanese prosody is opposite to English prosody in terms of the pause between two sentences and pitch reset at the beginning of the

second sentence. In English, the pause between two sentences is longer in negative than in positive semantic relations. In Japanese, the pause is longer in positive semantic relations. Pitch reset in English is more complete in negative relations than in positive. In Japanese, pitch reset is more complete in positive than in negative semantic relations. These facts seem to show that in Japanese two sentences are more separated in positive than in negative semantic relations. This is contrary to English, where two sentences are more separated in negative than in positive semantic relations, as Nespor and Vogel (1986) argue. We will discuss the implications of these results in the next section.

4. Discussion

4. 1. Branching direction

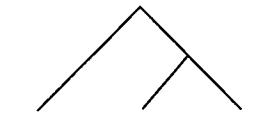
This prosodic difference between English and Japanese is difficult to explain using the semantics or pragmatics of conjunctions, which seem to be the same universally. The Japanese test sentences have parallel meanings to the English test sentences, as we have shown in Section 3. Then, we should try to find the reason for the prosodic difference in an area of grammar other than semantics. In this section, we discuss some possible explanations: branching direction, negative words separating two sentences and word/morpheme status of conjunctives.

The first possibility is to assume that the difference between English and Japanese comes from the difference in the branching direction of phrase structure. It has been argued that English is a right-branching language while Japanese is a left-branching language. This is schematically shown in (11) and (12).

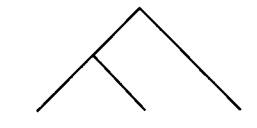
(11) a. [A [B [C]]] right-branching: English

b. [[[A] B] C] left-branching: Japanese

(12) a.



b.



The branching direction stems from the syntactic head-complement orders such as verb-object and adposition-object. For example,

(13) a. [write [long letters]]

b. [[[*nagai tegami-o*] *kaku*]

long letters-Acc write

(14) a. [in [your town]]

b. [[*anata-no machi*] *de*]

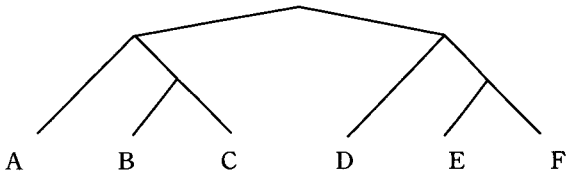
you-Gen town in

If we assume that discourse is a constituent dominating sentences (S), English and Japanese have the structures in (15) and (16) for a pair of sentences:

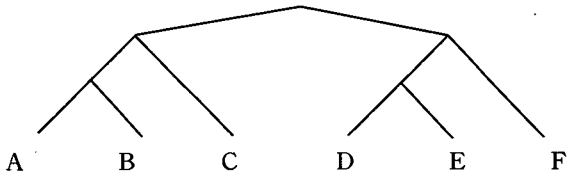
(15) a. [[$_{S1}$ A [B [C]]] [$_{S2}$ D [E [F]]]] right-branching: English

b. [[$_{S1}$ [[A] B] C] [$_{S2}$ [[A] B] C]] left-branching: Japanese

(16) a.



b.



English (15a) has three right brackets and one left bracket between C and D while Japanese (15b) has one right bracket and three left brackets. Tokizaki (2008b) analyzes the occurrence of phonological change in a number of languages and argues that left brackets are stronger than right brackets in blocking the application of phonological rules (cf. Wagner (2005)). Then, left-branching languages such as Japanese have more strong boundaries between two sentences than right-branching languages such as English. This is shown in (17), where left (strong) brackets are in bold face.

(17) a. $[[_{S1}$ A [B [C]]] $[_{S2}$ D [E [F]]]] right-branching: English

b. $[[_{S1}$ [[A] B] C] $[_{S2}$ [[D] E] F]] left-branching: Japanese

Here, C (the last constituent in S_1) is separated from D (the first constituent in S_2) by one strong boundary and three weak boundaries in (17a), and by three strong boundaries and one weak boundaries in (17b). Thus, we would predict that in terms of the prosody of discourse, two sentences in a positive semantic relation are more separated from each

other in Japanese than in English.

However, the data in our experiments do not show this expected difference between English and Japanese. The most parallel examples between English and Japanese are [E3]/[J3] and [E4]/[J4], where two sentences are conjoined, repeated here as (18).

(18) Average pause length (sec.)

[E3] a. 0.34

b. 0.47

[E4] a. 0.43

b. 0.49

(19) Average pause length (sec.)

[J3] a. 0.35

b. 0.32

[J4] a. 0.41

b. 0.19

The pause length between two sentences is almost the same in the positive semantic relation: [E3a] 0.34, [J3a] 0.35; [E4a] 0.43, [J4a] 0.41. Thus, we cannot simply ascribe the prosodic difference between English and Japanese to the difference in branching direction and the bracket strength. We need to examine more examples of the pause length between two sentences with a positive semantic relation in English and Japanese.

4. 2. Negative conjunctions and syntactic brackets

The second possible way to explain the prosodic difference between English and Japanese is to take into account the fact that English needs a conjunctive word in linking two sentences while Japanese uses a

conjunctive morpheme. The English example sentences in (5) are repeated here as (20).

(20) English Test Sentences:

[E1] a. The temperature was high. I drank beer.
b. The temperature was low. I drank beer, though.

[E2] a. The price was low. I bought a lot.
b. The price was high. I bought a lot, though.

[E3] a. I did it OK. I made no mistakes.
b. I did it OK. I made some mistakes, though.

[E4] a. It's almost two. I got sleepy.
b. It's almost two. I'm not sleepy, though.

[E5] a. It's late. I'm leaving. (la[ɾ])
b. It's late. I'm not leaving, though. (*la[ɾ])

[E6] a. Where's Esther? I need her. (Esthe[r])
b. Where's Esther? I'm not in a hurry, though. (*Esthe[r])

[E7] a. You should call Anna. It's late. (Anna[r])
b. Finish your pasta. I'll eat it otherwise. (*pasta[r])

The sentences (b) with negative semantic relations have at the final position the conjunction *though* in [E1]-[E6] and *otherwise* in [E7]. The positive sentences (a) and negative sentences (b) in [E1] to [E7] can be schematically represented as in (21a) and (21b) (cf. Tokizaki 2007).

(21) a. $[[_{S1}$ A [B [C]]] $[_{S2}$ D [E [F]]]]
b. $[[_{S1}$ A [B [C]]] $/_{S2}$ [D [E [F]]] though/]

A negative conjunction at the final position adds another pair of

brackets at both ends of the second sentence, shown here in italics. Thus, the number of brackets between C and D is four in (21a) and five in (21b). Tokizaki (2008a, b) argues that the number of brackets corresponds to the length of juncture. For example, the pause between subject and predicate is longer in (22b) than in (22a).

(22) a. [They [want [to [go [to France]]]]]
b. [[Mary [and Jane]] [want [to [go [to France]]]]]]

The difference in pause between (22a) and (22b) can be ascribed to the number of brackets: one bracket between *they* and *want* in (22a) and three brackets between *Jane* and *want* in (22b). Thus, we can explain the fact that in English, the two sentences with a negative semantic relation in (21b) are more separated from each other than the two sentences with a positive semantic relation in (21a). As we have seen above, the pause between two sentences is longer in negative semantic relations than in positive semantic relations in English. We repeat the statistically significant data here as (23), where (a) sentences are connected with a positive semantic relation and (b) sentences with a negative semantic relation.

(23) Average pause length (sec.)

[E1]	a.	0.42
	b.	0.52
[E2]	a.	0.30
	b.	0.43
[E3]	a.	0.34
	b.	0.47
[E6]	a.	0.24

b. 0.42

[E7] a. 0.19

b. 0.36

Also, pitch reset from the last syllable in the first sentence to the first syllable in the second sentence is greater in negative semantic relations than in positive semantic relation, as in (8) above, repeated here as (24).

(24) Average pitch difference between σ_1 and σ_2 (Hz): $\sigma_2 - \sigma_1$ (pitch reset)

[E6] a. -10.75

b. 36.77

In sum, these differences between positive and negative semantic relations are due to the number of brackets between two sentences. A negative relation is expressed by an additional negative conjunction, which makes one more boundary between two sentences.

4. 3. Conjunctives : words vs. morphemes

The next question is why Japanese shows longer juncture in positive semantic relations than in negative semantic relations. We will try to answer this question in two steps. First, Japanese sentences do not need any independent word to connect them. Japanese conjunctives can be morphemes attaching to verbs; these conjunctive morphemes do not add any boundaries between the two sentences. This explains the fact that Japanese does not have longer juncture in negative semantic relations than in positive semantic relations, as occurs in English. Second, a negative semantic relation connects two sentences more strongly than a positive

semantic relation, at least in Japanese. We will argue these two points in turn below.

The first point about Japanese connective morphemes can be illustrated with the example sentences we used in the experiments (4), repeated here as (25).

(25) [J1] a. *Atsukatta-node nama-o nonda*. (C2: Accented)
hot-was-because draft-Acc drank
'As it was hot, I drank draft beer.'

b. *Samukatta-noni nama-o nonda*.
cold-was-though draft-Acc drank
'Though it was cold, I drank draft beer.'

[J2] a. *Yasukatta-node momo-o tabeta*. (C2: Unaccented)
cheap-was-because peach-Acc ate
'As it was cheap, I ate a peach.'

b. *Takakatta-noni momo-o tabeta*.
expensive-was-though peach-Acc ate
'Though it was expensive, I ate a peach.'

[J3] a. *Anohito-wa yoku yatta-yo. Misu-shinakatta-ne*.(S2:Accented)
that person-Top well done-Prt miss-did-not-Prt
'He did well. He made no mistake.'

b. *Anohito-wa yoku yatta-yo. Misu-shita-kedo-ne*.
that person-Top well done-Prt miss-did-though-Prt
'He did well. He made mistakes, though.'

[J4] a. *Osoku-natta-ne. Nemuku-natta-yo*. (S2: Unaccented)
late-became-Prt sleepy-got-Prt
'It's late. I got sleepy.'

b. *Osoku-natta-ne. Nemuku-nai-kedo*.

late-became-Prt sleepy-not-though

'It's late. I'm not sleepy, though.'

The connectives used in these sentences are *-noni* and *-kedo*, which are basically bound morphemes attaching to the preceding verb.[2] We claim that these bound morphemes do not add any brackets to the sentence they attach to, as shown in (26), which represents the structure of [J4] in (25).

(26) a. [*Osoku-natta-ne*] [*Nemuku-nai*]
late-became-Prt sleepy-not
'It's late. I'm not sleepy.'

b. [*Osoku-natta-ne*] [*Nemuku-nai-kedo*]
late-became-Prt sleepy-not-though
'It's late. I'm not sleepy, though.'

Alternatively, we can argue that connective morphemes attach to the immediately preceding morpheme and add a bracket to its left, as shown in (27).

(27) a. [*Osoku-*[*natta-ne*]] [*Nemuku-nai*]
late-became-Prt sleepy-not
'It's late. I'm not sleepy.'

b. [*Osoku-*[*natta-ne*]] [*Nemuku-*[*nai-kedo*]]
late-became-Prt sleepy-not-though
'It's late. I'm not sleepy, though.'

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[2] *Kedo* can be used as an independent word in colloquial expressions. We take *kedo* to be an abbreviated form of another conjunctive word *keredomo* or *dakedo* (but).

(i) *Osoku-natta-ne. Kedo/keredomo/dakedo nemuku-nai-yo.*
late-became-Prt but sleepy-not-Prt
'It's late. But I'm not sleepy.'

In (27b), *nai* has a bracket to its left because of the conjunctive morpheme *-kedo*. However, both (26b) and (27b) have an extra bracket between the two clauses, i.e. between *-ne* and nemuku, when compared with (26a) and (27a), respectively. The addition of negative connectives does not increase the number of brackets between two clauses/sentences in Japanese. This word/morpheme difference explains the prosodic difference between English and Japanese. Typologically, we can ascribe the word/morpheme difference to the morphological difference between agglutinative and isolating languages. This morphological difference might also be related to the prosodic difference between left- and right-branching languages (cf. Plank (1998) and Tokizaki (2008b)).

Let us move on to the second argument. A negative semantic relation connects two sentences more strongly than a positive semantic relation, at least in Japanese. A possible argument for this comes from English intonation. It has often been said that falling tone signals 'completeness', 'finality' or 'independence' while rising tone signals 'incompleteness', 'infinality' or 'dependence' (Wells 2006, Halliday and Greaves 2008, among others). The first clause/sentence in two-sentence discourses is typically pronounced with falling tone in positive semantic relations and with rising tone in negative semantic relations, as illustrated in (28), where falling tone is represented with a grave accent and rising tone with an acute accent.

(28) a. Alice is rich. She is happy.

b. Although Alice is poor, she is happy.

Then, rising tone in a negative semantic relation shows that the two sentences are in a dependent relationship. This fact about English intonation also shows that two sentences in a negative semantic relation

are more closely connected to each other than those in a positive semantic relation, not only in Japanese but also in English, contra Nespor and Vogel (1986). This semantic closeness of the negative relation seems to be universal among languages.

The closeness of the negative relation shows up in Japanese straightforwardly. As we have seen, Japanese has the same number of brackets between two clauses/sentences in both positive and negative cases, as in (27). In English, the closeness of negative semantics is overridden by the separating effect of the additional boundary created by a negative conjunction, as shown in (21), repeated here as (29).

(29) a. $[[_{S1}$ A [B [C]]] $[_{S2}$ D [E [F]]]]

b. $[[_{S1}$ A [B [C]]] $/_{S2}$ [D [E [F]]] though/]

We claim that both syntactic brackets and semantic closeness affect the prosody between two sentences in both languages in the same way. The different prosody between English and Japanese is due to the word/morpheme difference of negative conjunctions.

5. Conclusion

We started with Nespor and Vogel's (1986) observation that a negative semantic relation blocks intrasentential phonological change in English. This observation implies that two sentences in a negative semantic relation are more separated from each other than two sentences in a positive semantic relation. We have tested if this is also the case in Japanese, by comparing pause length and the degree of pitch reset in parallel sentences in English and Japanese. The result of the experiments

has shown that Japanese prosody is the opposite of English: in Japanese, two clauses/sentences with a positive semantic relation are more separated from each other than those with a negative semantic relation. This result does not conform to the first assumption that two sentences in a negative semantic relation are more separated from each other than two sentences in a positive semantic relation in any language.

We discussed three possible ways of explaining the prosodic difference between English and Japanese: branching direction, syntactic brackets added by negative conjunctions and the word/morpheme distinction of conjunctives. We argued that conjunctive words in English add a bracket between two clauses/sentences while conjunctive morphemes in Japanese do not. We claimed that a negative semantic relation makes two clauses/sentences closer to each other in any language. This semantic effect, not as strong as the syntactic effect, can be overridden by a syntactic bracket inserted by a negative conjunction in English.

These arguments explain the difference between English and Japanese: two clauses/sentences with a negative semantic relation are more separated from each other in English, while they are more closely connected in Japanese.

Needless to say, this study needs to be supported by data from languages other than English and Japanese. However, it reveals an interesting relation between prosody, syntax, and the semantics of discourse.

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