

Prosody of Positive and Negative Conjunctions

Hisao Tokizaki, Sapporo University
Yasutomo Kuwana, Asahikawa Jitsugyo High School

In this paper, we discuss how 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[r] I'm leaving]
b. [U It's late] [U I'm not leaving though] → * [U It's la[r] I'm not leaving though]

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 *Us* into a single *U*.

The question is whether 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, positive semantic relation helps to join two prosodic domains, but negative semantic relation does not. However, the data show that in Japanese, positive semantic relation does not help to join two prosodic domains any more than negative semantic relation. In fact, in Japanese, two prosodic domains are more detached in the examples of positive semantic relation than in those of negative semantic relation.

We conducted experiments as follows. Six English speakers and sixteen Japanese speakers were asked to read the printed sentences. We analyzed seven pairs of English examples and four pairs of Japanese examples (see Test Sentences [1]-[11] on the third page), each of which consists of two clauses/sentences in positive/negative semantic relation, the second clause/sentence starting with an accented/unaccented word in Japanese examples. We calculated pause duration and the pitch difference between the last syllable (mora) of the first clause/sentence (C1/S1) and the first syllable (mora) of the second clause/sentence (C2/S2) (and the pitch difference between the first and the second syllable (mora) in C2/S2 in unaccented cases). This is schematically shown in (2), where the pause duration between σ_1 and σ_2 and the pitches of σ_1 and σ_2 are measured.

- (2) [C1/S1 ... σ_1] [C2/S2 σ_2 ...]

We found that in English, the two sentences are more separated from each other if they are in negative semantic relation (e.g. *but, though*) than in positive semantic relation (e.g. *and, therefore*). The pause duration between σ_1 and σ_2 is longer in negative relation than in positive relation in Test Sentences [1], [2], [3], [6] and [7] with statistic significance $p < 0.05$. The pitch difference between σ_1 and σ_2 are also wider in negative relation than in positive relation in [6] with $p < 0.05$, which shows that pitch reset at the beginning of C2/S2 is more complete in negative relation than in positive relation. This result is what we expect from the phonological observation by Nespor and Vogel (1986) shown in (1).

Surprisingly, we found that Japanese data show the opposite result to English. In the examples in [8], two clauses with the first word in C2 accented (high pitch underscored), positive semantic relation [8a] has longer pause between two clauses than negative [8b]. In [9], two clauses with the first word in C2 unaccented, we found no statistically significant difference in pause and pitch difference between positive [9a] and negative [9b]. In [10], two

sentences with the first word in S2 accented, positive [10a] shows greater pitch reset between two sentences than negative [10b]. In [11], two sentences with the first word in S2 unaccented, positive [11a] has longer pause between two sentences than negative [11b] (and shows greater Initial Lowering in another example). These differences between positive semantic relation [8a], [10a] and [11a] and negative [8b], [10b] and [11b] are statistically significant with $p < 0.05$.

These findings show that positive/negative semantic relation affects prosody across clauses/sentences in Japanese differently from English. Longer pause duration in [8a] and [11a] shows that two clauses/sentences in positive semantic relation are more detached from each other than those in negative semantic relation. Greater pitch reset in [10a] and greater Initial Lowering in the same type of example as [11a] show that two sentences in positive semantic relation are detached by a prosodic boundary between two major phrases or two minor phrases.

This prosodic difference between English and Japanese is difficult to explain by the semantics or pragmatics of conjunctions, which seem to be the same universally. We argue that the difference between English and Japanese comes from the difference in branching direction of phrase structure in discourse. It has been argued that English is a right-branching language while Japanese is a left-branching language. This is schematically shown in (3).

- (3) a. [A [B [C]]] right-branching: English
 b. [[[A] B] C] left-branching: Japanese

If we assume that discourse (D) is a constituent dominating sentences (S), English and Japanese have the following structure for a pair of sentences:

- (4) a. [_D [_{S1} A [B [C]]] [_{S2} D [E [F]]]] right-branching: English
 b. [_D [_{S1} [[A] B] C] [_{S2} [[A] B] C]] left-branching: Japanese

(4a) has three right brackets and one left bracket between C and D while (4b) has one right bracket and three left brackets. Tokizaki (2008) analyzes occurrence of phonological change in a number of languages and argues that left brackets are stronger than right brackets in blocking 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. Thus, we can explain the prosody of discourse in positive semantic relation: two sentences are more separated from each other in Japanese than in English.

The remaining questions are why two sentences in negative relation are more separated from each other than those in positive semantic relation in English and why Japanese shows the opposite pattern to English. Tokizaki (2007) argued that the first question about English can be answered by comparing the structure of positive case (4a) with that of negative case (5).

- (5) [_D [_{S1} A [B [C]]] [_{S2} [D [E [F]]] though] right-branching: English

There is one more left bracket between C and D in (5) than in (4a), which gives long juncture.

The second question about Japanese negative conjunction can be answered by assuming that in any languages two sentences in negative semantic relation are more closely connected to each other than those in positive semantic relation, contra Nespor and Vogel (1986). The closeness in negative shows up in Japanese, which has the same number of morphemes and syllables in positive and negative cases as in (4b) and [8]-[11], while the closeness is overridden by the boundary created by a negative conjunction in English as in (5). The morphological difference between agglutinative and isolating languages might also be related

to the prosodic difference between left- and right-branching languages (cf. Plank (1998) Tokizaki 2008)).

This study needs to be supported by data from other languages, but it reveals an interesting relation between prosody, syntax, and semantics of discourse.

Test Sentences

English

- [1] a. The temperature was high. I drank beer.
 b. The temperature was low. I drank beer, though.
- [2] a. The price was low. I bought a lot.
 b. The price was high. I bought a lot, though.
- [3] a. I did it OK. I made no mistakes.
 b. I did it OK. I made some mistakes, though.
- [4] a. It's almost two. I got sleepy.
 b. It's almost two. I'm not sleepy, though.
- [5] a. It's late. I'm leaving.
 b. It's late. I'm not leaving, though.
- [6] a. Where's Esther? I need her.
 b. Where's Esther? I'm not in a hurry, though.
- [7] a. You should call Anna. It's late.
 b. Finish your pasta. I'll eat it otherwise.

Japanese

- [8] a. *Atsukatta-node nama-o nonda.*
 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.'
- [9] a. *Yasukatta-node momo-o tabeta.*
 cheap-was-because peach ate 'As it was cheap, I ate a peach.'
 b. *Takakatta-noni momo-o tabeta.*
 expensive-was-though peach ate 'Though it was expensive, I ate a peach.'
- [10] a. *Anohito-wa yoku yatta-yo. Misu-shinakatta-ne.*
 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.'
- [11] a. *Osoku-natta-ne. Nemuku-natta-yo.*
 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.'

References

- Nespor, Marina and Irene Vogel. 1986. *Prosodic phonology*. Dordrecht: Foris.
- Plank, Frans. 1998. The co-variation of phonology with morphology and syntax: A hopeful history. *Linguistic Typology* 2, 195-230.
- Tokizaki, Hisao. 2007. "Intrasentential prosody: Conjunction, speech rate and sentence length" *Nouveaux cahiers de linguistique française* 28 (2007), 359-367. The University of Geneva.
- Tokizaki, Hisao. 2008. "Symmetry and asymmetry in the syntax-phonology interface" 2008. *Phonological Studies* 11, 123-130.
- Wagner, Michael. 2005. Asymmetries in Prosodic Domain Formation. *MIT Working Papers in Linguistics*. 49, 329-367.