

A new type of structural downtrend in Tokyo Japanese

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There are two categories of F0 downtrend in Japanese: structure-independent and structure-dependent F0 downtrend. The former is known as declination, which is the natural tendency for F0 to lower over the course of an utterance. In contrast, downstep is classified as a structure-dependent F0 downtrend. In Japanese, downstep is traditionally described as a pitch range compression triggered by the lexical pitch accent (Poser 1984). If the pitch height of X is significantly lower after an accented word than after an unaccented word, X is diagnosed to be downstepped (Kubozono 1993, Ito and Mester 2013). The assumption of this approach is that in Japanese, downstep is triggered only by accented words. This study aims to demonstrate that there exists a new type of structure-dependent F0 downtrend in coordinated unaccented words.

This experiment examined F0 downtrends in a syntagmatic manner to check whether a phenomenon comparable to downstep occurred when there was no preceding accented word. The targets were three-mora and four-mora unaccented words coordinated by the conjunction *ya*, as in *uranai-ya meeru* “fortune telling and e-mails.” Participants were asked to read sentences aloud at either a normal or a fast rate of speech. The researchers measured the F0 descent range and the duration of three regions: the last mora of the first noun combined with the conjunction *ya* (Region 1, [-DB]); the conjunction *ya* along with the first mora of the second noun (Region 2, [+DB]); and all the moras of the second noun (Region 3, [-DB]). If domain boundaries (DBs) cause a structural F0 downtrend without the existence of accents, Region 2 should indicate the widest F0 range.

The results of the experiment, in fact, revealed that the F0 range is significantly more extensive in Region 2 than in Regions 1 or 3 (see Figures 1). Also, a statistically significant main effect of the duration and a significant interaction between the F0 descent range and the duration were observed in both comparisons. If declination is assumed to be time-dependent, it would explain the significant main effect of the duration. In contrast, the significant main effect of DB and the significant interaction between the DB and the duration imply that the observed F0 downtrend must involve a mechanism that is independent of declination. If declination is the only mechanism to cause the F0 downtrend for unaccented words, the F0 range should not differ substantially between Region 1 and Region 2, or between Region 2 and Region 3.

In conclusion, the outcomes obtained from this experiment demonstrate that there must be another structure-dependent mechanism in the lowering of the F0 of coordinated unaccented words than merely declination or downstep. Furthermore, this new type of structure-dependent downtrend could be generalized with downstep because downstep could be explained by the separation of domains as well, considering that lexical accent triggers the separation of domains due to accent culminativity (Ito and Mester 2013).

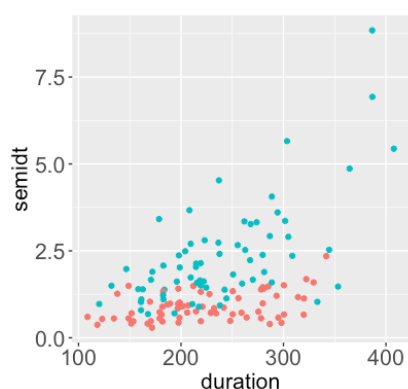


Figure 1. Relation between the duration (ms) and the F0 descent (semitone) between region 1 ([-DB]) and region 2 ([+DB]).

References

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