

Processing of Lexical Prosody in L2 Word Recognition: Evidence from Japanese L2ers of English

As many studies on L1 word recognition have reported, lexical candidates can be activated and constrained by lexical prosodic cues. However, as lexical prosody varies across languages, the ways that the listeners integrate lexical prosodic information during lexical access are expected to vary across languages. The present study examines how language-specific variation in lexical prosody affects the processing of English lexical stress by measuring eye movement of native English speakers and Japanese speaking L2 learners of English (hereafter, Japanese–English L2ers) during L2 word recognition.

Research that examined the use of the lexical stress in English word recognition has shown mixed results. Cutler (1986) which used a cross-modal priming task to test minimal pairs such as *fórbear* versus *forbéar* which differ only by stress patterns found that auditory presentation of either member of a pair equally activated both members in a neutral context. Whereas, Cooper et al. (2002) found that stress matched prime word took less response time in a lexical decision task even when the listeners were given only a single syllable as a prime fragment.

In contrast to English, most of the studies that examined the role of Japanese pitch accent showed Japanese L1 listeners use lexical pitch accent when identifying target words. Cutler & Otake (1999) used an identification task and gating to see how Japanese listeners use HL and LH accent contrast in bimoraic Japanese words. The result showed that listeners guessed what the target word was even when only the beginning CV of the stimuli was presented. In a cross-modal priming experiment where accent-matched or mismatched auditory stimuli were followed by a visual Kanji character, Sekiguchi and Nakajima (1999) found that only accent-congruent words showed a priming effect in both types of pitch accent.

In the present study, 48 nonword stimuli were constructed by randomly combining the most frequent eight phonemes appearing at each position of English trisyllabic words. Of the 48 nonwords, 32 were 16 minimal stress pairs (e.g., /dʒákunat/ vs. /dʒakúnə/) which were cohorts in the first two syllables but segmentally distinguished by the last syllable. Half of the 32 target words had primary stress on the penultimate syllable and the other half had primary stress on the antepenultimate syllable. The remaining 16 words were fillers. For the experiment, 20 English L1 speakers and 12 Japanese-English L2ers were trained over three sessions to associate drawings of novel ‘objects’ with tri-syllabic nonword names that had first- or second-syllable stress. In a fourth session, eye movements were monitored as listeners from each language group followed the instruction, “Click on the (target word) now” and selected the correct object from a set of three: the target, a stress competitor, and an irrelevant distractor.

Mean arcsine transformed fixation proportions to the target and the competitor were submitted to a one-way ANOVA with object as a factor for each 100 ms time window before and after the onset of the first syllable of the target word. The onset time point of the target word was set to 0 ms. As for English L1 listeners, ANOVAs revealed a significant effect of object from 200 ms up to 1000 ms for trochaic target words ($F_s > 2$),

which time bins coincide with the ones from the end of the first syllable of the target word to the end of the sentence. For iambic condition, the main effect of object was found from 400 ms to 1000 ms ($F_s > 2$), which corresponds to the end of the second syllable throughout the end of the sentence. This result indicates that native listeners as a control group employed lexical stress information to identify target words, but their lexical decision was delayed until the end of the stressed second syllable for iambic word recognition. For Japanese-English L2ers, a significant effect of object was found right after the onset of the target word until the end of the sentence in the trochaic condition (All $F_s > 5$). Iambic words also shows potentially significant differences between the fixation proportions to target and competitor from 200 ms, the onset of the target word, until the end of the target word, approaching significances (All $F_s(1,11) > 3$, $p = 0.1$). Japanese-English L2ers' processing of lexical stress in English clearly shows that the lexical stress information in the initial syllable of the target word is informative enough for Japanese-English L2ers to identify target word, suggesting a positive transfer of lexical prosody processing from L1. These results indicate that the learners access and integrate the lexical stress information for L2 word recognition is largely influenced by the characteristics of lexical prosody in L1.

References

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