A preliminary study on boundary effects in vowel devoicing in Japanese

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It has been argued in the literature of high vowel devoicing in standard Tokyo Japanese (HVD) that HVD is sensitive to morphological boundaries. For example, McCawley (1968) observes that accent shifting in verb and adjective alternations triggered by HVD has the stem as the domain. Vance (1992), looking at nominal compounds with two potential undergoers of HVD in successive syllables, finds that the presence of a morphological boundary prohibits HVD. Yoshida (2004) argues that "compound boundaries" block the occurrence of HVD more frequently than "morpheme boundaries" do. The visibility of word-internal structure in HVD is a challenge to phonological theories. According to Lexical Phonology (e.g., Kiparsky 1982), for example, processes in the postlexical domain do not refer to word-internal structure (only phonological information is available in that domain). However, HVD is a postlexical process as it is non-structure-preserving and non-categorical. The reference to the word-internal information is also not expected in the prosody-morphology/syntax interface hypothesis: phonological/phonetic rules refer only to prosodic structure, not directly to morphological/syntactic structure.

In this paper, I explore the effects of morphological boundaries in HVD in a production experiment. Following Vance (1992), I use words that have two potential undergoers of HVD in consecutive syllables. I compare eight minimal pairs consisting of nonsense monomorphemic CVCV̲CV̲*ka* words (e.g., *nakisuka*; underlines indicate the potential devoicing sites) and words that are segmentally identical but are bimorphemic, with the noun *ka* (科) ('a subject of, a family of') in the last syllable CVCV̲CV̲+*ka* (e.g., *nakisu+ka*). If the boundary has an effect, the second potential undergoers of HVD would be affected differently between the two groups. Ten speakers from Tokyo or nearby areas participated in the study. They read words in a carrier phrase and five times in randomized order. I removed the first instances of words from the analysis.

The results suggest that HVD is not sensitive to morphological boundaries. The second potential undergoers of HVD were devoiced 100% of the time, whether they were adjacent to the boundary (CVCV̲CV̲+*ka*) or not (CVCV̲CV̲*ka*) (N=320 in each).

To further test whether HVD is affected by phonological boundaries, specifically the foot, I investigate a comparable group of words consisting of CVCV̲CV̲+*kagi* 'key'/*kan* 'can' (e.g., *nakisu+kagi*). Assuming that Japanese feet are formed bimoraically from right to left, the two potential undergoers of HVD are footed differently in these words (i.e., CV(CV̲CV̲)(*kagi*); parentheses denote feet) than those discussed above (i.e., (CVCV̲)(CV̲*ka*)), and thus they might behave differently in HVD if the foot has an effect. The results indicate that there may be an effect. The second potential undergoer of HVD is still almost all (99.8%, N=637) devoiced. However, the first one behaves differently in a few tokens in half of the participants. If this is a significant effect, it follows that it is the phonological, not morphological, information that is available in HVD, which supports the view of Lexical Phonology and the prosody-morphology interface hypothesis discussed above.

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