

BACKGROUND AND SYNOPSIS: Cross-linguistically, among voiced stops, consonants with backer place of articulation are more marked (i.e. *[g] >> *[d] >> *[b]) (Ohala 1983; Hayes and Steriade 2004). Ihara et al. (2011), through an experiment using nonce words, demonstrate that this markedness hierarchy (at least partially) manifests itself in Rendaku. They found that the applicability of Rendaku follows the order of *[g] ~ *[d] > *[b]. (e.g. the speakers were most likely to tolerate creating [b]). Our talk, through a study of the Corpus of Spontaneous Japanese (CSJ), demonstrates that the devoicing of voiced geminate stops in loanwords, induced by Lyman’s Law (e.g. /doggu/ => [dokku]: Nishimura 2003; Kawahara 2006 *et seq.*), follows the same markedness hierarchy: the devoicability likelihood follows the order of [gg] > [dd] > [bb]. The results demonstrate that the same markedness hierarchy may govern Rendaku and the devoicing of geminates in loanwords. The observed hierarchy moreover accords well with the aerodynamic difficulty of voiced stops (Ohala 1983).

METHOD: We conducted an exhaustive search of CSJ, which provides both underlying forms (“*kihon-kei*”) and surface forms (“*hatsuon-kei*”). From CSJ we first extracted words with underlying voiced geminate stops, and then excluded tokens in which the voiced geminates underwent some changes other than devoicing. The process resulted in a total of 1,348 tokens.

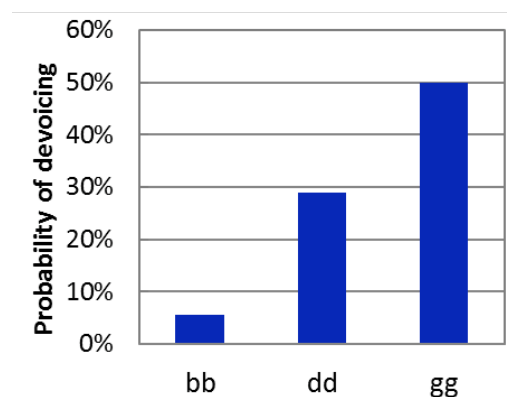


Figure 1

We then calculated the probability of devoicing for each place of articulation.

RESULTS AND DISCUSSION: The results appear in Figure 1, which shows that the devoicability follows the order of [gg] > [dd] > [bb]. The results have three theoretical implications for the phonological theory of Japanese and beyond. First, this demonstrated effect shows that place of articulation affects the applicability of the devoicing of geminates, as briefly noted by Kawahara (2006) (also addressed by Kawahara 2011a, b).

Second, the devoicability hierarchy is paralleled with the results of the nonce-word based experiment of Rendaku by Ihara et al (2011), in which the applicability of Rendaku followed the order of *[g] ~ *[d] > *[b]. Our results demonstrate that the same markedness hierarchy may govern the applicability of Rendaku and the devoicing of geminates in loanwords.

Finally, the markedness hierarchy is compatible with what is expected from the aerodynamic difficulty of voiced stops (Ohala 1983; Hayes 1999; Hayes and Steriade 2004). The intraoral airpressure rises more quickly for backer consonants, and hence it becomes more difficult to implement voicing for backer consonants. The devoicability hierarchy is also compatible with the perceptibility hierarchy of voicing contrasts in geminates, found in a perception experiment by Kawahara (2006). Our results thus accord well with the idea that devoicing of geminates in Japanese loanwords is phonetically natural (Kawahara 2006).