

Phonetic perceptibility and phonological patterns: the case of geminates

Focusing on cross-linguistic patterns of geminates this talk addresses the issue of how phonetic factors affect phonological patterns. In particular, I ask the following two questions: (i) Do phonological patterns have their roots in phonetic factors? (ii) If so, do speakers have knowledge of phonetic naturalness and deploy it in *synchronic* phonological patterns? The talk consists of two parts: Part 1 addresses question (i), and building on that, Part 2 addresses question (ii)

Part 1 begins with the observation that sonorant geminates are disfavored in many phonological systems (Bribri, LuGanda, Ilokano, etc). Following Podesva (2000), I hypothesize that the dispreference against sonorant geminates exists because sonorant geminates are easily confused with corresponding singletons. This confusability problem arises because sonorants have blurry transitions into and out of flanking vowels, and consequently their constriction durations are difficult to perceive. Since the difference in constriction duration serves as the primary cue for singleton-geminate contrasts, the phonological singleton-geminate distinction for sonorants is particularly confusable. I report a perceptual experiment on Arabic, which directly supports the hypothesis that sonorant geminates are confusable with corresponding singletons. In identifying singleton-geminate continua, Arabic listeners took longer to respond to sonorant stimuli than obstruent stimuli. Furthermore, the identification functions crossed over less abruptly for sonorant stimuli than obstruent stimuli, indicating that the sonorant continua were less reliably categorized than obstruent continua. I conclude that the general phonological dispreference against sonorant geminates has its root in the perceptual imperative to avoid segments that are confusable with other segments.

In Part 2, I investigate whether this perceptual problem of sonorant geminates shapes the synchronic phonological patterns of a language having both obstruent geminates and sonorant geminates: would speakers prefer obstruent geminates over sonorant geminates, when their native language allows both types of geminates? I demonstrate through an experiment that although Japanese possesses both stop geminates and nasal geminates, Japanese speakers nevertheless prefer stop geminates over nasal geminates i.e. consider nasal geminates as more marked than stop geminates. Japanese has many reduplicative mimetic words like *pika-pika* ‘shiny,’ which can be emphasized by geminating a consonant in the word (e.g. *pikka-pika*). In the first documentation of this pattern in 1991, Japanese speakers consistently geminated the second consonant (Tamori 1991). However, Nasu (1999) points out that they recently started allowing gemination of the third consonant, when geminating the second consonant results in a marked voiced obstruent geminate (e.g. *kebak-kebbba* instead of *kebba-keba*). Building on this insight, I conducted an auditory well-formedness judgment task using nonce-words. The results reveal that Japanese speakers prefer geminating the second consonant when both the second and third consonants are stops (e.g. *pakki-paki*), but when the second consonant is a nasal and the third consonant is a stop, they shift the loci of gemination, favoring *penap-pena* over *penna-pena*. In other words, when Japanese speakers productively create emphatic forms, they actively avoid nasal geminates. The emergent dispreference against nasal geminates is particularly interesting given that stop geminates and nasal geminates are both allowed in Japanese phonology with comparable lexical frequency. I thus conclude that phonological markedness of nasal geminates—grounded in their perceptual problem, as revealed in Part 1—synchronically shapes this novel phonological pattern in Japanese.