Constraint Induction in the Historical Development of Initial Accent in Kyoto Japanese Trimoraic Nouns

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Background: In Kyoto Japanese (KJ) accented trimoraic nouns, not every possible accent location is equally prevalent. Instead, there is a preference for initial mora (μ) accent, as shown below.

(1) Prevalence of accent locations in KJ accented trimoraic nouns

	Initial μ Accent	Second μ Accent	Final μ Accent
Native Nouns (Yoshida and Zamma 2001)	**68%**	32%	N/A
All Lexical Strata (calculated from Sugito 1995)	**73%**	27%	N/A

However, historically, KJ accented trimoraic nouns did not always exhibit this preference. In Early Middle Japanese (EMJ), initial accent accounted for only about 6% of accented trimoraic nouns (calculated from Sugito 1995). EMJ-KJ correspondences suggest that several accent classes merged into the initial accent pattern (Shimabukuro 2007, Frellesvig 2010).

Kawakami (1995, as cited by Nakai 2001) proposed that the increase in initial accent originated in a pitch rise enhancement process which lowered an L tone immediately preceding an H tone, causing any L tones preceding the lowered L tone to rise. Thus, for LLH, the following changes would occur: LLH > MLH > HLH. By this process, the EMJ forms LLL, LLH, and LLF would gain the initial H tone needed to eventually merge into initial accent (HLL), becoming HHL, HLH, and HLF respectively. HLH and HLF became HLL due to a pressure for words to have only one peak ("culminativity") (Nakai 2001, Shimabukuro 2007). HHL then underwent leftward kernel shift, shifting the lowering kernel on the second mora to the first mora, yielding HLL (Nakai 2001).

Proposal and Implications: What were the seeds of these changes? The present study argues that the changes described above can be attributed to pattern frequencies that cause learners to induce and rerank constraints in response to these frequencies.

Pattern frequencies in pre-pitch rise enhanced nouns in the accentual system of EMJ show a weak preference for word-initial H tones. This weak preference in conjunction with the increased frequencies of word-initial H from Kawakami's pitch rise enhancement process causes learners to induce INITIAL-H and promote it to a higher rank. INITIAL-H will have consequences for culminativity, preferring HLH > HLL instead of HLH > LLH. The constraint CULMINATIVITY becomes active because of relatively low frequencies of words with two peaks, causing learners to promote the constraint. Finally, the change HHL > HLL occurs due to the promotion of NOMULTILINK-H, a constraint prohibiting H tones from being linked to multiple moras (Ito and Mester 2018), on the basis of peak delay in a previous stage reducing the amount of multiply-linked H tones.

A test of the initial EMJ data using Hayes and Wilson (2008)'s UCLA Phonotactic Learner induces a constraint similar to the INITIAL-H constraint proposed here, suggesting that learners can induce constraints and vary their strengths based on pattern frequencies in the input data.

References: Frellesvig, B. (2010). *A History of the Japanese Language*. **Hayes, B. and Wilson, C.** (2008). A Maximum Entropy Model of Phonotactics and Phonotactic Learning. **Ito, J. and Mester, A.** (2018). Pitch accent and tonal alignment in Kagoshima Japanese. **Nakai, Y.** (2001). The History of the Kyoto Accent. **Shimabukuro, M.** (2007). *The Accentual History of the Japanese and Ryukyuan Languages*. **Sugito, M.** (1995). *Ōsaka Tōkyō Akusento Onsei Jiten* [Osaka-Tokyo Accent Voice Dictionary]. **Yoshida, Y.Z. and Zamma, H.** (2001). The Accent System of the Kyoto Dialect of Japanese: A Study on Phrasal Patterns and Paradigms.