

## A Factorial Typology of Pitch-Accent Alignment in Japanese Dialects

**Introduction.** Japanese dialects vary in how they distribute the tones of an accentual melody across a word. As clearly described by Kubozono (2012, 2016), three closely related dialects in the Kagoshima prefecture—Kagoshima, Koshikijima, and Kikai-Nakasato—provide a window into the precise, intricate patterns of variation. Following up on Ito & Mester (this workshop), we present a formal Optimality Theoretic-system in the sense of Alber, DelBusso, & Prince (2016) based on these patterns. The system yields a *factorial typology*—a collection of languages predicted under constraint re-ranking—which makes predictions regarding the range of such variation.

The dialects of Kagoshima, Koshikijima, and Kikai-Nakasato all map the H of an underlying LHL melody to the penultimate mora in words that end with two light syllables, as in [ka.go.SI.ma]. (High tone material is underlined and CAPITALIZED; all other material is associated with a low tone.) But these dialects differ in how they treat /...σ<sub>μ</sub>σ<sub>μ</sub>#/ words with underlying LHL like *wasinton* 'Washington.' *wasinton* is realized as [wa.SIN.ton] in Kagoshima but [wa.sin.TON] in Koshikijima and Nikai-Nakasato. All three dialects differ in the realization of /...σ<sub>μ</sub>σ<sub>μ</sub>#/ words like *huransu* 'France', as shown in (1).

(1) *Alignment of LHL# accent in three Japanese dialects*

(Kubozono 2012, 2016)

<i>Kagoshima</i>	<i>Koshikijima</i>	<i>Kikai-Nakasato</i>	<i>Gloss</i>
hu. <u>RAN</u> .su	hu. <u>RAn</u> .su	hu.ra <u>N</u> .su	'France'
wa. <u>SIN</u> .ton	wa.sin. <u>TON</u>		'Washington'
ka.go. <u>SI</u> .ma			'Kagoshima'

Adler, Ito, Kalivoda, & Mester (in preparation) provide an analysis of this pattern: a constraint ALIGNRIGHT(H) favors aligning the underlying H to the right edge of the word, but the underlying L and several additional constraints force minimal violation of right-alignment. We investigate the formal properties of the system and the predicted and unpredicated patterns of tonal spreading.

**GEN & CON.** We follow Alber, DelBusso, & Prince (2016) in defining an OT system S as a pair ⟨GEN<sub>s</sub>, CON<sub>s</sub>⟩, and explicitly define each component. In our system for accent alignment, GEN enumerates a candidate set which preserves underlying metrical structure and links the tones of the accentual melody to moras (never to syllables). We include seven constraints in CON, all of which are based on classic autosegmental theory. The constraints are given in (2).

### (2) *Constraints*

- a. MAX(T): Violated by every tone present in the input and absent in the output.
- b. NOCONTOUR(μ): Violated by a mora linked to more than one tone.
- c. NOCONTOUR(σ): Violated by a σ containing moras of distinct tonal specification.
- d. ALIGNRIGHT(H): Violated by every mora intervening between the right edge of a high tone and the right edge of the word.
- e. H-TO-HEAD-μ: Violated by an H which is not linked to the initial μ of some σ.

- f. NO-MULTI-LINK-H: An H has only one association line. An H with  $n$  association lines receives  $n-1$  violations.
- g. FINAL-T: Violated by a toneless word-final  $\mu$ .

**Analysis.** Like OT constraints in general, these constraints conflict with one another. Notably, ALIGNRIGHT(H) faces off antagonistically against H-TO-HEAD- $\mu$ , a licensing constraint demanding that a high tone associate to a prominent syllable-initial mora. Ranking the latter above the former yields deviations from maximal right-alignment. Kikai-Nakasato strives to satisfy ALIGNRIGHT(H) at the expense of H-TO-HEAD- $\mu$ , yielding forms like [hu.ra $\underline{N}$ .su] 'France' with high tone on a non-prominent mora. Kagoshima and Koshikijima exhibit the reverse ranking, but further details regarding tone spread and alignment distinguish the two, thanks to the re-rankable constraints NOCONTOUR( $\sigma$ ) and NO-MULTI-LINK-H, which penalize deviations from autosegmental mapping of tone to TBU in a one-to-one fashion. NOCONTOUR( $\sigma$ ) is of particular interest, since it enables us to capture the syllable-counting behavior of Koshikijima without setting a parameter declaring the syllable as the language's TBU. This resolves a problem faced by parametric theories, namely that Koshikijima displays syllable-internal contours when words are sufficiently short (Kubozono 2012, 2016).

**Predictive potential.** The notion of *factorial typology* allows us to make firm predictions regarding empirical typology; if a language arises under a ranking in an OT system, then according to the theory, it is a possible human language. Our system generates a factorial typology containing not only Kagoshima, Koshikijima, and Kikai-Nakasato, but also 53 additional languages. Subsequent to developing the system, we have found that one language included in our factorial typology is empirically attested; the dialect of Kobayashi (Miyazaki prefecture), with all final H's, arises when ALIGNRIGHT(H) dominates MAX(T). Thus, factorial typology can inform data collection, which can in turn confirm or disconfirm an OT analysis. We hope to test the aptness of our system through further investigation of pitch accent systems in Japanese and beyond.

#### References.

- Alber, B., N. Delbusso, & A. Prince. From intensional properties to universal support. *Language* 92:2, pp. e88-e116. Kubozono, H. 2012. Varieties of pitch accent systems in Japanese. *Lingua* 122, pp. 1395-1414. Kubozono, H. 2016. Moras and Syllables in Japanese Dialects. Talk delivered at the JK Workshop on Syllables and Prosody, NINJAL, Tachikawa, Japan. Oct. 13, 2016.