

Title: Garo Gemination: A Case of Faithfulness Producing non-Moraic Geminates.
Research Question: What phonological factors can give rise to predictable geminates?

ABSTRACT

Standard Garo, an understudied Sino-Tibetan language of India and Bangladesh has a predictable gemination process. Garo is a monosyllabic language and gemination is triggered whenever a morpheme ending with a consonant combines with a morpheme that begins with a vowel, e.g., [dok] “hit” + [-a] “neutral tense” = [dok.ka] “hit (something)”. The pattern can be seen to be that of a *progressive gemination* in Garo. A mirror image of this, i.e., *regressive gemination* is not observed however, as there is no doubling of a consonant when a morpheme ending with a vowel combines with a morpheme beginning with a consonant, e.g., [sa] “who” + [-k^ho] “Acc” = [sa.k^ho] “whom”, the form *[sak.k^ho] is unattested.

Garo facts are unusual in the typology. Garo gemination cannot be explained by phonological representations such as the underlying mora as in Hayes (1989), or underlying length as in Hume, et al. (1997) as it is completely predictable, and since Garo does not have vowel length contrasts. Nor is it a case of assimilation as in Bengali (Kotzor, Wetterlin, & Lahiri, 2017) and Japanese (Kager, 1999). Garo patterns are not explained by a single phonological factor, but instead emerge out of a complex interaction of faithfulness alignment constraints and markedness constraints requiring an unmarked syllable shape (Zec, 2007).

/dok + a/	ALIGN (σ-R, MORPH-R)	ONSET	ALIGN (σ-L, MORPH-L)	/sa + ko/	ALIGN (σ-R, MORPH-R)	ONSET	ALIGN (σ-L, MORPH-L)
☞ [dok.ka]			*	☞ [sa.k ^h o]			
[dok.a]		*!		[sak.k ^h o]	*!		
[do.ka]	*!		*	[sak.o]	*!	*	*

The ranking of the constraint **ALIGN (σ-R, MORPH-R)** which requires that the *right edge of a morpheme coincide with the right edge of a syllable*, over the markedness constraint **ONSET** which demands that *syllables must have onsets* (Kager, 1999) ensure the syllabification of final consonant of the first morpheme as the coda of the first syllable of the final word. This rules out ungrammatical forms such as *[do.ka] and also rules out patterns of regressive gemination such as *[sak.k^ho].

What triggers gemination consequently is the higher ranking of the constraint **ONSET** over the constraint **ALIGN (σ-L, MORPH-L)** which requires that the *left edge of a morpheme coincide with the left edge of a syllable* (Kager, 1999). This rules out the maximally faithful candidates such as *[dok.a] since it does not have an onset in the second syllable of the final word. This constraint ranking gives rise to an *emergence of the unmarked* (Rice, 2007) as it ensures that the preceding consonant geminates to produce an unmarked syllable shape (Zec, 2007).

This paper shows from Garo that gemination is not always a product of the underlying representation (Hayes, 1989; Hume, et al., 1997) or assimilation as attested in Bengali (Kotzor, Wetterlin, & Lahiri, 2017) and Japanese (Kager, 1999). Garo presents a case in which gemination arises as an instance of emergence of the unmarked due to a complex interaction of faithfulness alignment and markedness syllable well-formedness constraints. Gemination thus cannot be viewed as purely being a product of the phonological representation or assimilation as Garo presents a case of gemination that is a product of the phonological module.

Garo data also show that the universal syllabification algorithm as in Hayes (1989) can be suspended by faithfulness constraints. The ranking **ALIGN (σ-R, MORPH-R) >> ONSET** prevents universal syllabification patterns which would syllabify the final consonants of the preceding morpheme as the onset of the following syllable.

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References

- Goldsmith, J. (1976). *Autosegmental Phonology*. PhD Dissertation. Cambridge, Massachusetts: MIT Press.
- Hayes, B. (1989). Compensatory Lengthening in Moraic Phonology. *Linguistic Inquiry*, 20(2), 253–306.
- Hume, E., Muller, J., & Van Engelenhoven, A. (1997). Non-moraic geminates in Leti. *Phonology*, 14(3), 371–402. <https://doi.org/10.1017/s0952675798003467>
- Kager, R. (1999). *Optimality Theory*. Cambridge University Press.
- Kenstowicz, M. (1994). *Phonology in Generative Grammar*. Cambridge, Massachusetts: Blackwell Publishers.
- Kotzor, S., Wetterlin, A., & Lahiri, A. (2017). Bengali geminates: Processing and representation. In H. Kubozono, *The Phonetics and Phonology of Geminate Consonants* (pp. 187-203). New York: Oxford University Press.
- McCarthy, J. J. (1986). OCP effects: Geminataion and Antigeminataion. *Linguistic Inquiry*, 207-263.
- Rice, K. (2007). Markedness in Phonology. In P. d. Lacy, *The Cambridge Handbook of Phonology* (pp. 79-98). Cambridge: Cambridge Univeristy Press.
- Zec, D. (2007). The Syllable. In P. d. Lacy, *The Cambridge Handbook of Phonology* (pp. 161-194). Cambridge, UK: Cambridge University Press.