



An emergent contrast in Swahili: Prenasalized mb and cluster m.b



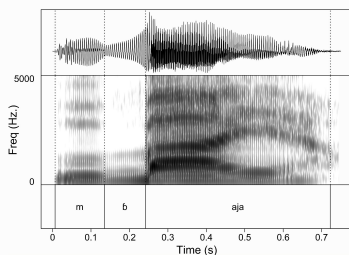
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1. Introduction

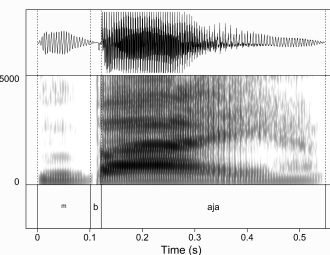
- **Are nasal-obstruent (NC) sequences units, or are they clusters?** (e.g. Downing 2005)
- Maddieson & Ladefoged (1993) claim both structures exist—and contrast—in Fula and Sinhala
- Herbert (1986) claims prenasalized consonants have similar duration to single segments, but Hubbard (1995) finds that NC sequences in Runyambo, Sukuma, and Luganda are *not* timed like single segments
- **We show that Swahili has two contrasting types of NC sequences**, which are distinguishable by duration

2. Swahili <mb> sequences

- Swahili has two relevant noun class prefixes:
 - Class 1/3: /m-/ (underlying /m/, from *mu- or *mi-)
 - Class 9: /N-/ (homorganic nasal, assimilates to b)
- For /b/-initial roots, this results in minimal pairs; e.g., *baya* /baja/ 'bad' → *mbaya*, which could be:
 - "Syllabic" m: cl. 1 [mbaja] 'bad one' (≈ 'bad guy')
 - Prenasalized b: cl. 9 [ᵐbaja] 'bad one' (≈ 'bad thing')



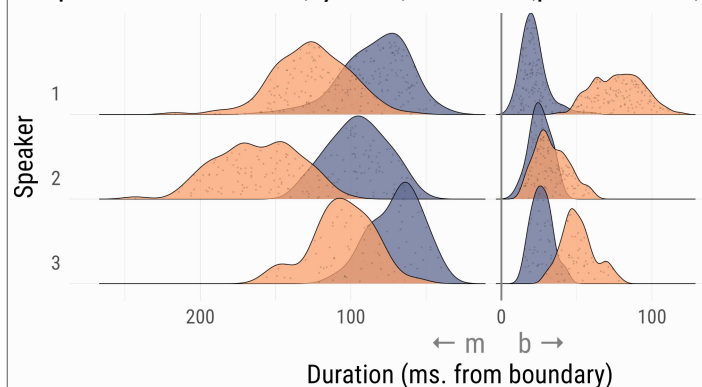
Syllabic m.b (cl. 1)



Prenasalized ᵐb (cl. 9)

3. Duration

- 1,102 'mb' tokens produced by 3 L1 Swahili speakers, split between cl. 1/3 (syllabic) and cl. 9 (prenasalized)



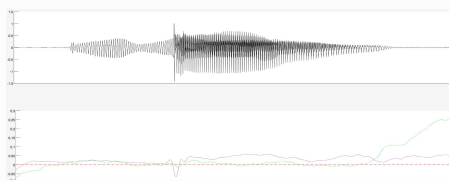
	Syllabic	Prenasalized
/m/ portion	136 ms [sd: 33]	85 ms [sd: 22]
/b/ portion	56 ms [sd: 24]	24 ms [sd: 8]
Combined	192 ms [sd: 34]	109 ms [sd: 25]

4. Speaker 1 in depth

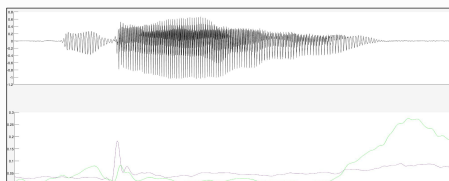
Oral and nasal airflow reveals implosives

Individual tokens

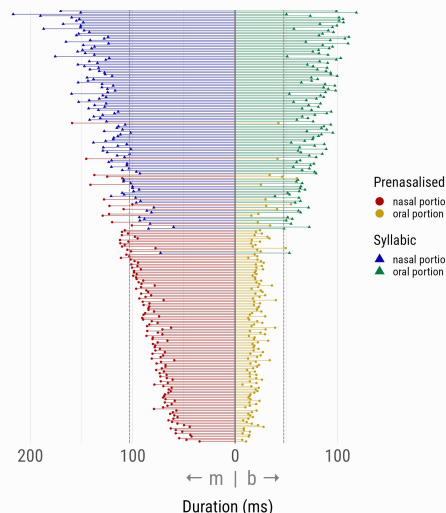
"Syllabic" [m] (cl. 1): implosive realization of [b]



Prenasalized [ᵐb] (cl. 9): [b] is not implosive



Oral airflow Nasal airflow



5. Conclusion

- The two prefixes contrast two kinds of <mb> sequences
 - cl.1: /m/+/b~b/ → [m.b]
 - cl.9: /N/+/b~b/ → [ᵐb]
- **Finding: [m] portion is longer in cl. 1 than cl. 9 for all 3 speakers**
- Impressionistically: cluster [m.b] is articulatorily less integrated than homorganic [mb], and may be realized with syllabic [m]
- The /b/ may be realized as implosive [b] (but speaker 2, from Zanzibar, has no implosives)
- Implosive [b] and plosive [b] are *not* contrastive otherwise

References

Ashton, E.O. (1966). Swahili Grammar. London: Longmans, Green and Co. Ltd. Downing, L. J. (2005). On the ambiguous segmental status of nasals in homorganic NC sequences. In M. van Oostendorp & J. van de Weijer (Eds.), The Internal Organization of Phonological Segments (pp. 183–216). De Gruyter Mouton. Herbert, R. K. (1986). Language Universals, Markedness Theory, and Natural Phonetic Processes. De Gruyter, Inc. Hubbard, K. (1995). Prenasalised consonants' and syllable timing: Evidence from Runyambo and Luganda. Phonology, 12(2), 235–256. Maddieson, Ian & Peter Ladefoged (1993). Phonetics of partially nasal consonants. In Marie K. Huffman & Rena Krakow, eds. Nasals, Nasalization and the Velum (Phonetics and Phonology 5). San Diego: Academic Press, 251-301.