

# TOWARDS A PHONETICALLY-INFORMED DESCRIPTION OF VOWEL HARMONY IN IHANZU

Stephen Nichols [stephen.nichols@ed.ac.uk] · University of Edinburgh — Réseau Français de Phonologie · 26–28.06.2024 · Université de Picardie Jules Verne

## 1. GOAL AND KEY QUESTIONS

A preliminary description of vowel harmony in Ihanzu

- Which vowels act as targets and which as triggers?
- Do we find any behavioural front–back asymmetries?
- What are the directionality and domain of harmony?

## 2. BANTU AND VOWEL HARMONY

Vowel harmony of some kind is extremely common in Bantu languages (Clements 1991, Hyman 1999: §2, Odden 2015: §1, Nichols 2021: ch. 2, Kula in press)

**Swahili (G.42; East Africa) (Kirkeby 2000, Awde 2002, Ngonyani & Ngowa 2016)**

-zib-i-a	'stop up for'	-zib-u-a	'unblock'
-fung-i-a	'shut for'	-fung-u-a	'open'
-teg-e-a	'set a trap for'	-teg-u-a	'disassemble a trap'
-chom-e-a	'stab for'	-chom-o-a	'pull out'
-pang-i-a	'arrange for'	-pang-u-a	'disarrange'

**Rangi (F.33; Tanzania) (Stegen 2002, Dunham 2005)**

-fik-ir-a	'arrive at'	-iit-ul-a	'take off (tr.)'
-tɔung-ir-a	'tie at/for'	-tɔung-ul-a	'untie'
-im-ir-a	'start'	-im-ul-a	'return (intr.)'
-fur-ir-a	'wash (clothes) at/for'	-sul-ul-a	'bleed'
-ker-er-a	'cut at/for'	-bend-ul-a	'break off'
-bak-er-a	'dig at/for'	-hɔɔ-ul-a	'wipe off'
-hak-ir-a	'smear at/for'	-hal-ul-a	'strip off'

**Kikuyu (E.51; Kenya) (Peng 2000)**

-tiy-er-ek-a	'abandon, be left over'	-it-or-a	'undo act of strangling'
-tum-er-ek-a	'join, intrude'	-juuk-or-a	'undo act of slandering'
-yer-er-ek-a	'have fetched for'	-et-or-a	'undo act of calling'
-hoð-er-ek-a	'be used'	-tom-or-a	'undo act of sending'
-tem-er-ek-a	'cut into shapes'	-yet-or-a	'undo act of tightening'
-βaj-er-ek-a	'cut for/at'	-βak-ɔr-a	'undo act of restraining'
-βað-er-ek-a	'become rich'	-tah-or-a	'undo act of scooping'

**Koyo (C.24; Congo) (Gazania 1972 in Hyman 1999: 244)**

e-símu	'scream'	i-yis-a	'to hide'
e-túsi	'shoulder'	i-kund-a	'to plant'
e-bémbo	'debt'	i-yeg-a	'to learn'
e-kóró	'skin'	i-wog-a	'to hear'
e-sege	'hoe'	i-dzeg-ε	'to laugh'
e-bɔɔ	'arm'	i-lag-ɔ	'to bewitch'
e-lagá	'promise'	i-lamb-a	'to cook'

## 3. IHANZU: INTRO AND PREVIOUS WORK

Ihanzu is a Bantu language (F.31B) spoken by ~26,000 people in Mkalama District, Tanzania (Harvey 2021)

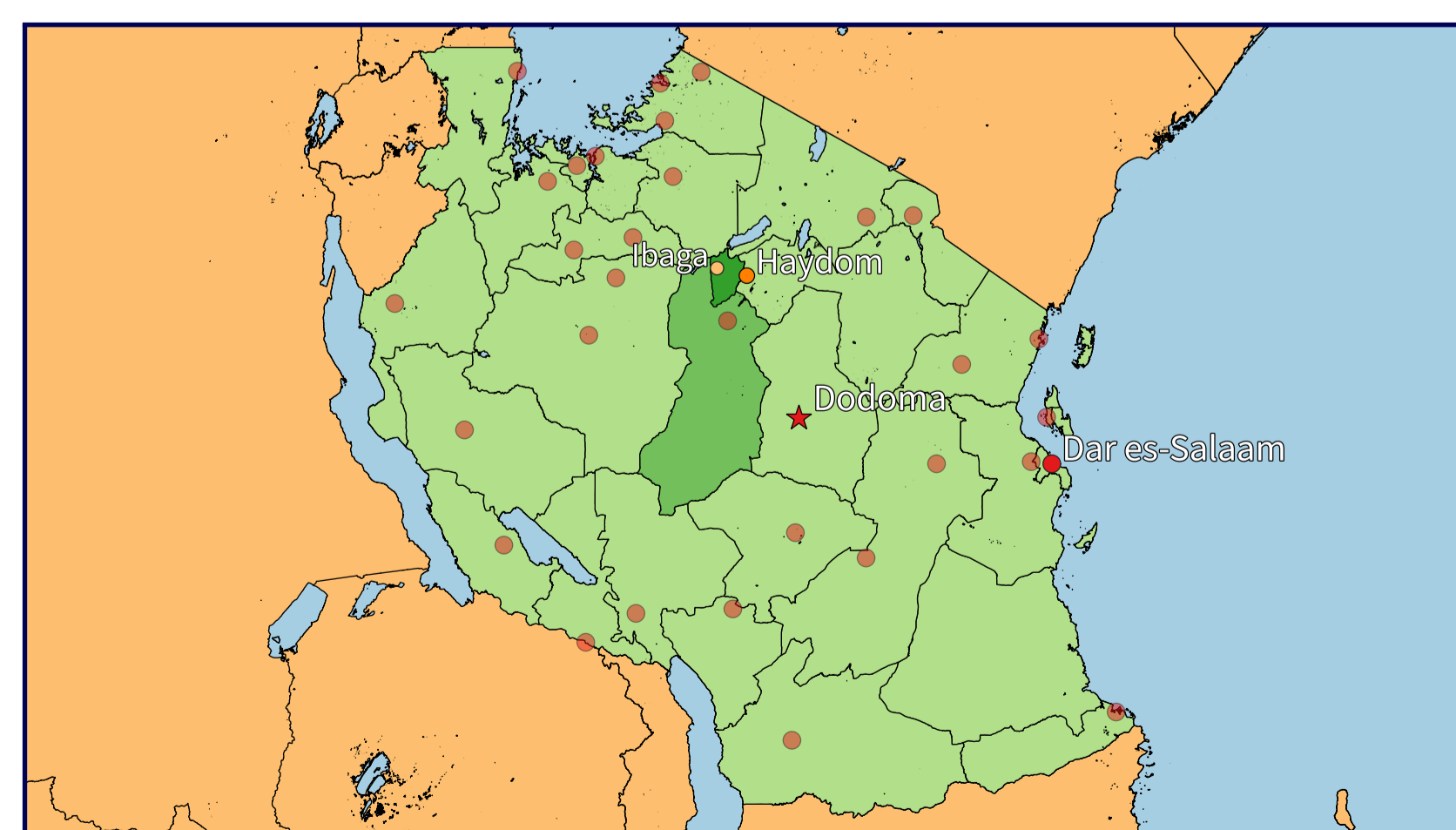


FIG. 1: Mkalama District within Singida Region within Tanzania

A large amount of material is available from the Endangered Languages Archive (Harvey 2019)

Despite this, the language remains under-researched

Ihanzu possesses seven phonemic vowel qualities: <i, u, ɨ, ɛ, e, o, a> (Beletskiy & Diyammi 2019, Harvey 2021)

<i, u, e, o, a> are agreed to be [i, u, ε, ɔ, a]; the qualities of <ɨ, ɛ> on the other hand are not so clear

Harvey (2021) transcribes these as [ɪ, ʊ] whereas Beletskiy & Diyammi (2019) favour [e, o]

Unsurprising given that distinguishing [ɪ, ʊ] and [e, o] is often fraught with difficulty (e.g. Casali 2008: 507–11)

Regarding harmony, however, there are no firm, explicit statements in the literature, let alone targeted studies

## 4. METHODOLOGY

Remote data collection “in” Ibagá and Haydom

Recorded locally with a Zoom H5 device

3 hours of elicitation across 5 sessions with a 72yo male

Clear tokens force-aligned/segmented with SPAS

Subsequent manual correction of each vowel and coding for morphological environment

Final total of 745 utterances and 3,933 vowel tokens

F1, F2, F3 and duration extracted with a Praat script

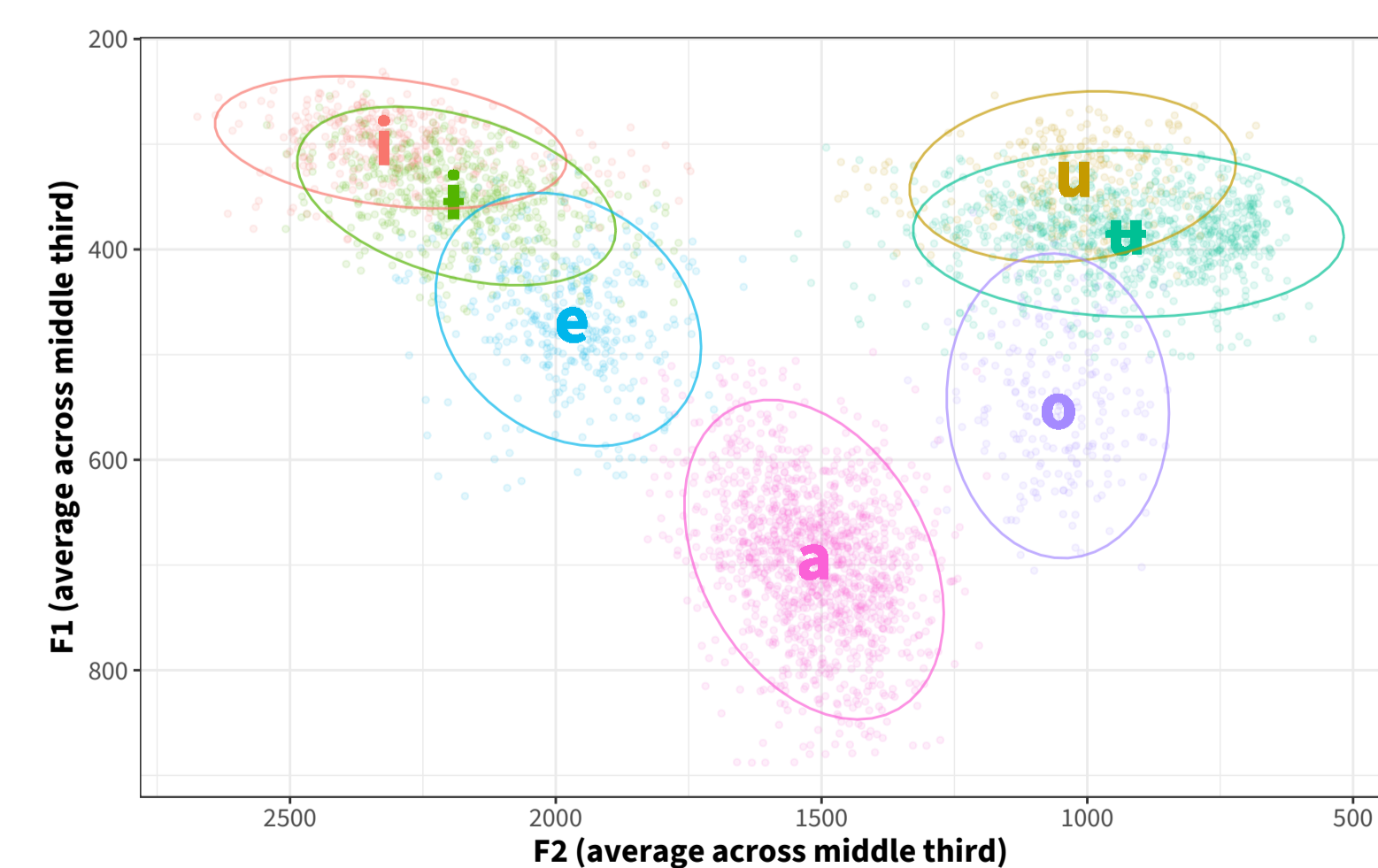
Further data processing and visualisation with R

The analysis involves both impressionistic judgements and empirical measurements

## 5. RESULTS

Firstly, Fig. 2 shows our speaker’s full vowel space

FIG. 2: F1×F2 space for all vowels



My impression is that [ɪ, ʊ] are the more accurate transcriptions but [e, o]-like tokens do nevertheless occur

Elicitation found canonical-like progressive alternations between <i~e> and <ɨ~o> in verbal extensions

ku-pih-ish-a	'to hide sth well'	ku-ki-ul-a	'to hide sth well'
ku-lug-il-a	'to cook for'	ku-tug-ul-a	'to take clothes off'
ku-dim-ish-a	'to herd for a long time'	ku-pi-ul-a	'to turn sth around'
ku-ug-ily-a	'to winnow for'	ku-hind-ugul-a	'to turn sth upside down'
ku-zeng-esh-a	'to build a lot'	ku-tyem-ul-a	'to sneeze'
ku-hom-el-a	'to stab for'	ku-kond-ogol-a	'to remove corn from cob'
ku-lah-il-a	'to hunt with'	ku-tam-ul-a	'to tear sth'

The attenuative suffix, however, is invariably -is-

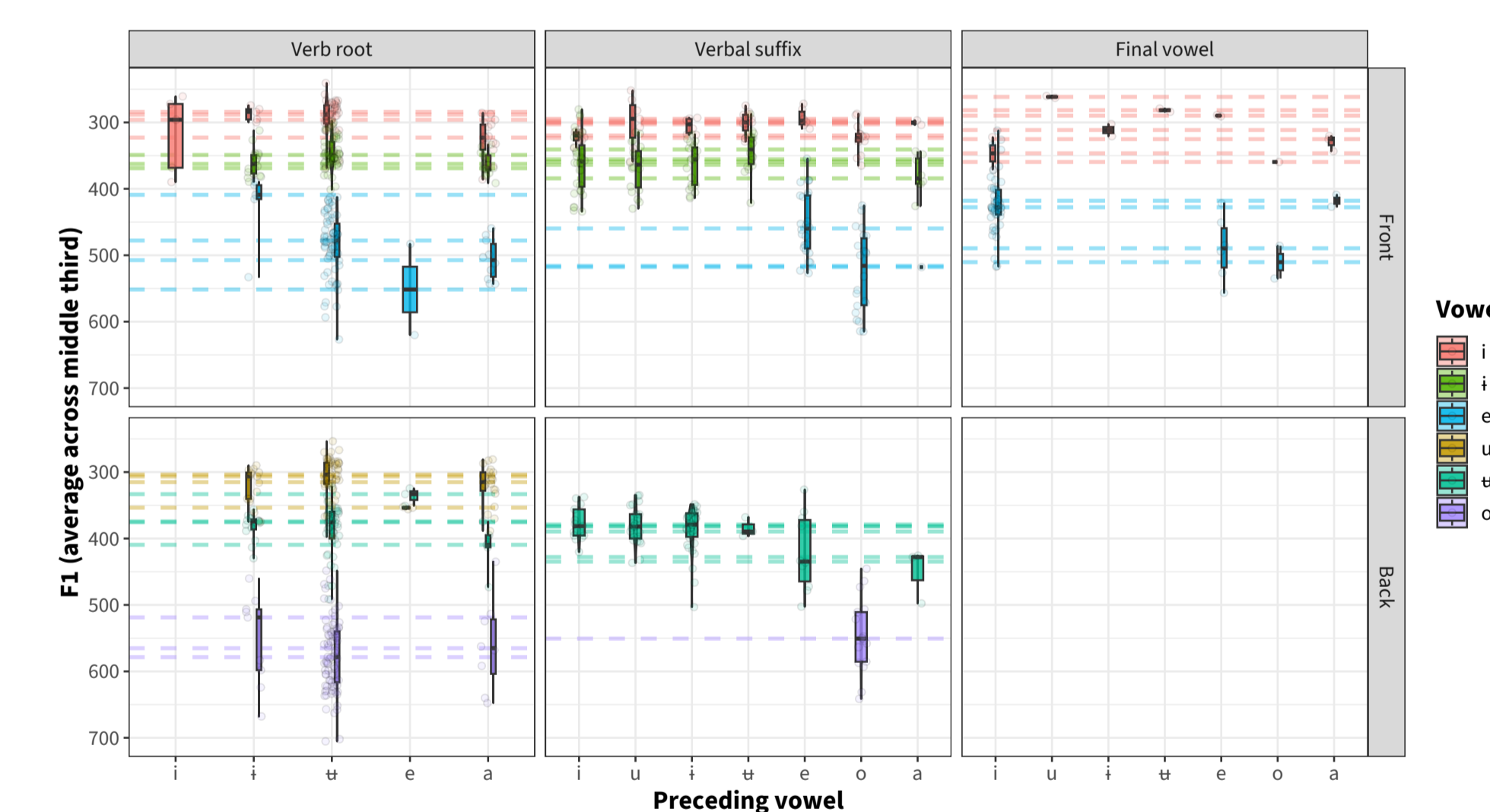
ki-pih-is-a	'to hide sth badly'	ki-zeng-is-a	'to build little/badly'
ki-lug-is-a	'to cook slowly/not enough'	ki-hom-is-a	'to stab slowly/barely piercing'
ki-dim-is-a	'to herd for a short time'	ki-lah-is-a	'to hunt badly'
ki-ug-is-a	'to winnow slowly/little'		

The perfective suffix and final inflectional vowels also show no alternations due to vowel harmony

-pih-ile	'hid (it)'	kiny-i	'stab! (pl.)'
-dug-ile	'cooked'	lug-i	'cook! (pl.)'
-dim-ile	'herded, tended'	dim-i	'herd! (pl.)'
-ug-ile	'winnowed'	ug-i	'winnow! (pl.)'
-zeng-ile	'built'	zeng-i	'build! (pl.)'
-ho-ile	'took'	hom-i	'stab! (pl.)'
-dah-ile	'hunted'	lah-i	'hunt! (pl.)'

This is borne out by the F1 measurements

FIG. 3: F1 by preceding vowel and morphological category



With respect to regressive harmony, the data here were less targeted and coverage was poorer

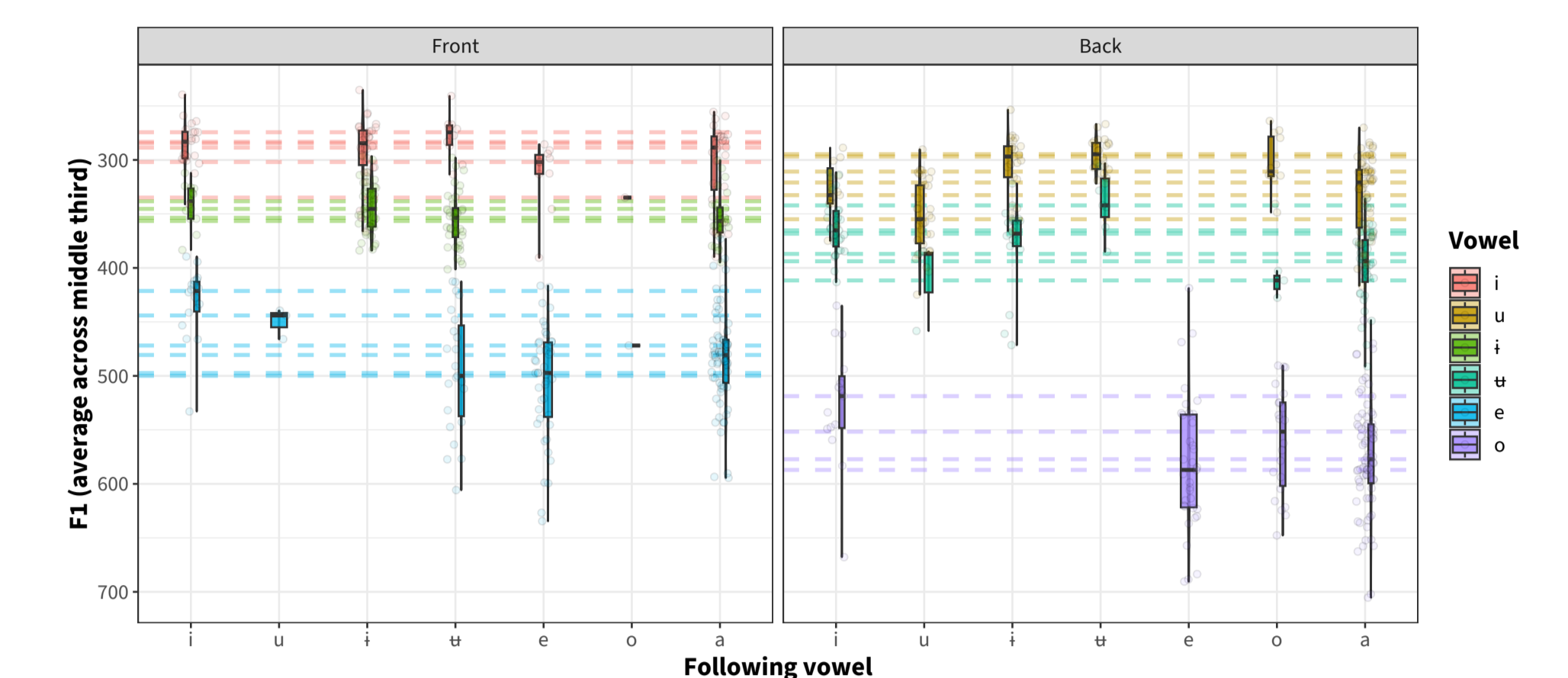
Nevertheless, there appears to be no regressive harmony between prefixes and following roots/stems

ki-tinde (\*ki-tinde) but i-tinde 'piece(s) of firewood which has already burnt'  
ku-luga (\*ku-luga) 'to cook' and ki-phisa (\*ki-phisa) 'to hide sth well'

However, the F1 measurements in Fig. 4 reveal very tentative evidence of (partial) raising of <e, o> by following <i, u> outside the prefixal domain

E.g. zeng-i 'build! (pl.)', n-dek-ile 'I left sth sw' or ku-pol-is-a 'to cool sth'

FIG. 4: F1 in root-initial syllables by following vowel



Cf. raising of /ε, ɔ/ to [e, o] before /i, u/ in e.g. Venda (S.21), Zulu (S.42) and Xhosa (S.41) (Kula 1997, Poulos & Msimang 1998, Jokweni & Thipa 1996)

Also reported by Stegen (2000) to occur before, for example, the causative suffix /-i-/ in nearby Rangi

## 6. SUMMARY AND FUTURE WORK

Ihanzu exhibits a form of progressive vowel harmony typical of 7V Bantu languages

In verbal extensions, <ɨ> is lowered to <e> after <e, o> and <ɛ> is lowered to <o> after <o> only

Suffixes containing <i> and final vowels, however, show no categorical alternations

There is little evidence of regressive harmony, with the possible exception of partial raising <e, o> before <i, u>

The recordings analysed so far are enough for a first attempt at a description of vowel harmony in Ihanzu

However, the data are from a single older male speaker

They are also somewhat limited in scope, especially for a thorough consideration of potential regressive effects

Future work will examine a wider and more balanced data set from both the present and additional speakers

It will also more carefully consider potential effects of prosody (duration, stress) on F1

**ACKNOWLEDGEMENTS** A heartfelt *sóngela* to Nicholas Nalingigwa Gideon for sharing his language with me in such a generous and thoughtful manner. Thank you also to Andrew Harvey for his guidance and for making remote data collection possible.

**REFERENCES** Awde, N. 2002. *Swahili-English English-Swahili dictionary*. New York, NY: Hippocrene. Beletskiy, S. & M. P. Diyammi. 2019. A Phonological and Morphological Sketch of Ihanzu (Bantu, Tanzania). *Journal of Siberian Federal University. Humanities & Social Sciences* 11(2), 4–19. Casali, R. F. 2008. ATR harmony in African languages. *Language and Linguistic Compass* 2, 496–549. Clements, G. N. 1991. Vowel Height Assimilation in Bantu Languages. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society: Special Session on African Language Structures* 17, 25–64. Dunham, M. 2005. *Éléments de description du langi, langue bantou F.33 de Tanzanie*. Leuven: Peeters. Gazania, R. 1972. Aspects phonologiques et morphologiques du koyo. Thèse de 3<sup>ème</sup> cycle, Université de Grenoble. Harvey, A. 2019. Ihanzu: an archive of language and cultural material from the Ihanzu people of Mkalama (Singida region, Tanzania). Endangered Languages Archive. URL: <http://hdl.handle.net/2196/00-0000-0000-0014-1365-F>. Harvey, A. 2021. Introducing Ihanzu: Contexts, Basics, and Puzzles. Talk given as part of the course 'Introduction to Field Methods', Bielefeld University, Germany, 28 May. DOI: <https://doi.org/10.5281/zenodo.4899358>. Watch: <https://youtu.be/s1jdlhb3z2o>. Hyman, L. M. 1999. The Historical Interpretation of Vowel Harmony in Bantu. In J.-M. Hombert & L. M. Hyman (eds.), *Bantu Historical Linguistics: Theoretical and Empirical Perspectives*, 235–95. Stanford, CA: CSLI Publications. Jokweni, M. W. & H. M. Thipa. 1996. ATR harmony in Xhosa. *South African Journal of African Languages* 16(4), 119–23. Kirkeby, W. A. 2000. *English Swahili Dictionary*. Dar es Salaam: Kakepala. Kula, N. C. 1997. H-Licensing and Vowel Harmony in Venda. MA dissertation, SOAS. Kula, N. C. in press. Vowel Harmony. In L. Marten, N. C. Kula, E. Hurler & J. Zeller (eds.), *The Oxford Guide to the Bantu Languages*. Oxford: Oxford University Press. DOI: <https://doi.org/10.1093/oxfordhb/9780199393345.013.53>. Peng, L. 2000. Kikuyu vowel harmony. *South African Journal of African Languages* 20(4), 370–84. Poulos, G. & C. T. Msimang. 1998. *A Linguistic Analysis of Zulu*. Pretoria: Via Afrika. Stegen, I. 2000. Rangi Vowel System: Five or Seven? Talk given at the 30<sup>th</sup> Colloquium of ACAL, Leiden, Netherlands, 28–30 August. Stegen, O. 2002. Derivational process in Rangi. *Studies in African Linguistics* 31(1/2), 129–53.