



**HAL**  
open science

# PROSODIC VARIATION OF KIBUSHI DIALECTS (MAYOTTE, FRANCE) VIA THE READING OF THE LITTLE PRINCE: A PILOT STUDY

Ahamada Kassime, Fabrice Hirsch, Miki Mori

► **To cite this version:**

Ahamada Kassime, Fabrice Hirsch, Miki Mori. PROSODIC VARIATION OF KIBUSHI DIALECTS (MAYOTTE, FRANCE) VIA THE READING OF THE LITTLE PRINCE: A PILOT STUDY. 13th International Seminar on Speech Production, May 2024, Autrans, France. hal-04583373

**HAL Id: hal-04583373**

**<https://hal.science/hal-04583373>**

Submitted on 22 May 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# PROSODIC VARIATION OF KIBUSHI DIALECTS (MAYOTTE, FRANCE) VIA THE READING OF THE LITTLE PRINCE: A PILOT STUDY

Ahamada Kassime<sup>1</sup>, Fabrice Hirsch<sup>1</sup>, Miki Mori<sup>1,2</sup>

<sup>1</sup>Paul Valéry University Montpellier 3, UMR 5267 CNRS Praxiling, <sup>2</sup>CUFR de Mayotte  
ahamada.kassime@univ-montp3.fr, fabrice.hirsch@univ-montp3.fr, miki.mori@univ-mayotte.fr

## Introduction

The Kibushi language exhibits linguistic affinity with a Malagasy dialect from the northwest of Madagascar, the Sakalava Dialect. Within Mayotte, there are two Kibushi dialects spoken across 21 villages: Kisakalava and Kiantalautsi. A recent study on Kibushi stress variation revealed diatopic differences, within three prosodic parameters— duration, pitch, and intensity — used to compare syllable stress in words across villages and dialects (Kassime *et al.*, 2023). However, no research has been carried out to determine the prosody of Kibushi in utterances longer than the word. With this in mind, the aim of this study is to describe the rhythmic and melodic organization of the different varieties of kibushi, focusing on declarative sentences. It's also an opportunity to explore parameters and techniques useful for studying speech production in a context of inter- and intra- village/dialect/speaker variability.

## Methods

### Material

Data were acquired in three villages:

- Acoua and Chiconi (Kisakalava dialects), and Ouangani (Kiantalautsi dialect).

26 participants were recorded in a quiet room using a Zoom H1N recorder:

- 11 from Acoua (5 women), 7 from Chiconi (1 man), and 7 from Ouangani (1 woman)
- Due to the voluntary nature of the project, age and gender are not representative

### Task

- Reading passages from *The Little Prince* in Kibushi
- 4 groups of readers per village (between 1 and 3 people per group, 2 groups are mixed gender)
- 3,464 words

### Techniques

- Phonetic transcription: Praat
- Prosodic variation results: Prosogram and Polytonia
- Analyses and results: R

### Prosodic measures

- Fundamental frequency: F0\_mean / F0\_min / F0\_max.
- The highest point of the fundamental frequency.
- The lowest point of the fundamental frequency.
- Syllable duration (in ms).

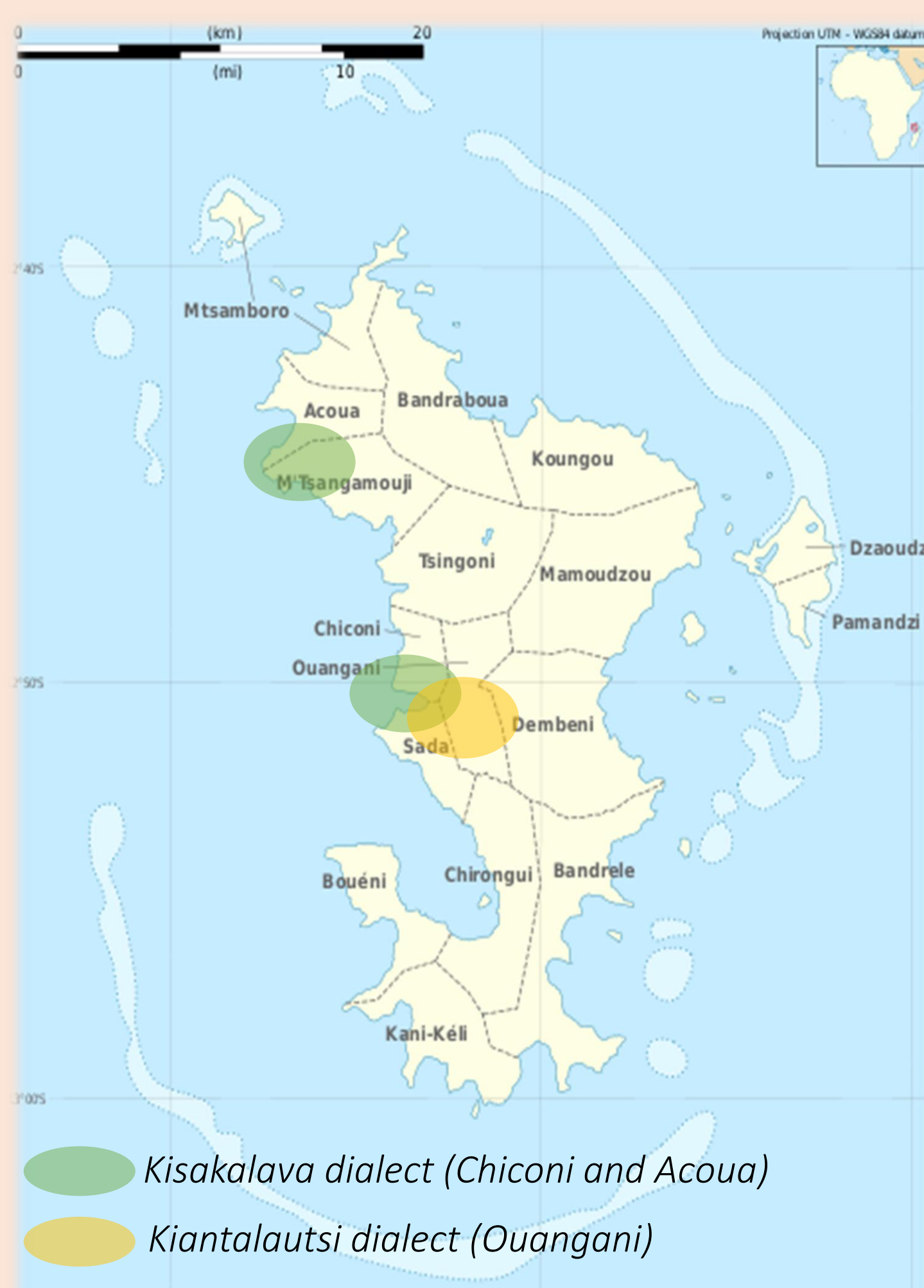


Figure 1: Location of the two dialects and villages in Mayotte.

## Results

### 1. Pitch variations in speech

	Gender	Average f0 (Hz)	f0 min (Hz)	f0 max (Hz)
Acoua	Man	135.5	130.1	140.2
	Woman	249.7	235.2	261.5
Chiconi	Man	225.6	213.2	235
	Woman	253.9	240.8	264.9
Ouangani	Man	217.8	210.2	224.4
	Woman	231.6	224.6	237.7

Table 1: F0 variation (Hz) in a reading context (*The Petit Prince*) by village and gender.

The results reveal no significant difference between f0\_min and f0\_max for each village, gender and dialect.

Acoua: pitch variations shows a slight difference between men and women.

### 2. High pitch in declarative sentences

Statements: the subject-predicate order.

Results indicate that the high pitch (H) is generally situated on the predicate across all villages.

H pitch on the predicate:

- Chiconi: 77% (n=27)
- Acoua: 79% (n=33)
- Ouangani: 63% (n=35).

These high pitches are predominantly located on penultimate and ultimate syllables.

H pitch on ultimate syllables:

- Ouangani: 51% (n=47)
- Chiconi 34% (n=32)
- Acoua 34% (n=41)

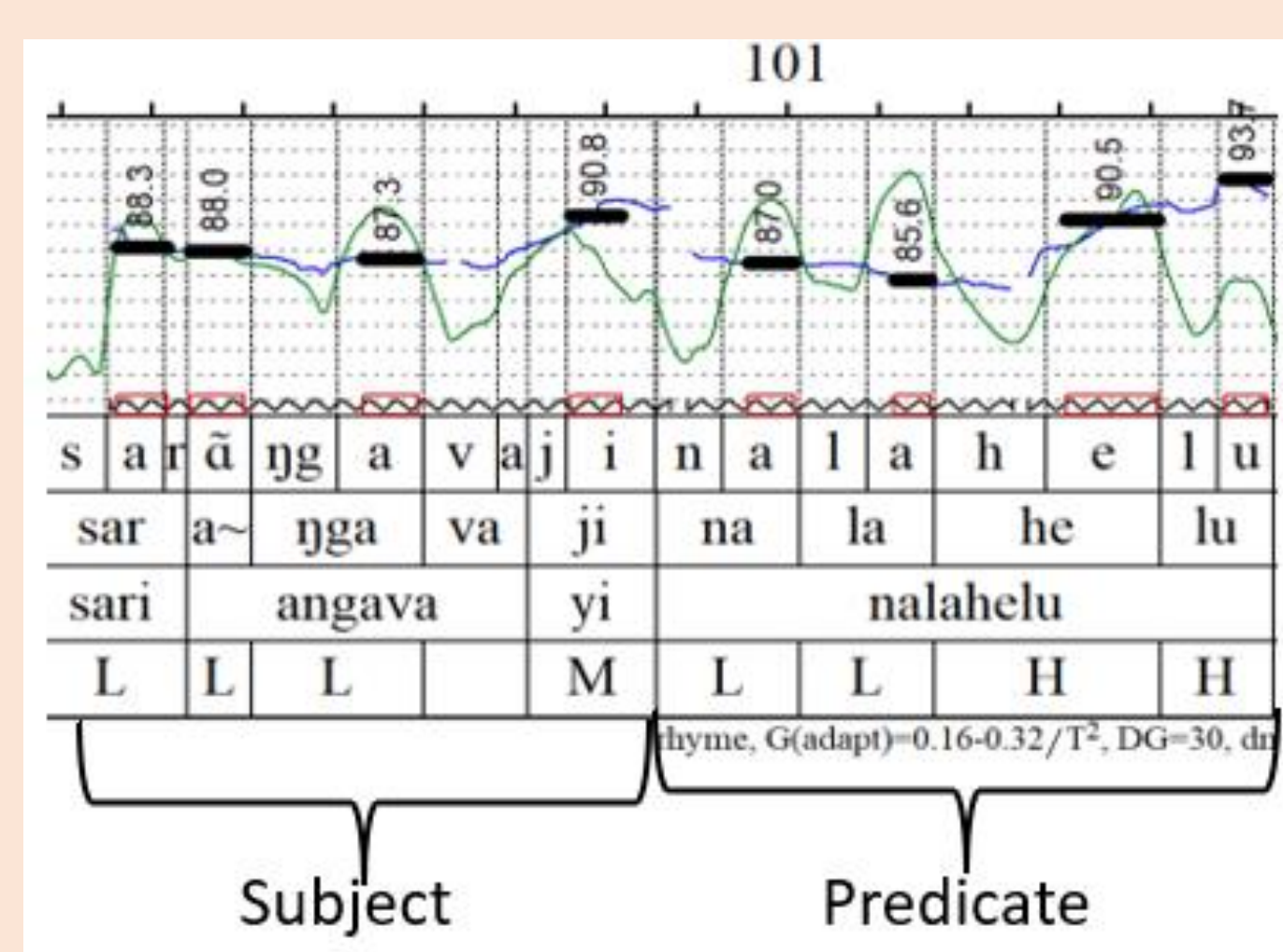


Figure 2: Example of statement with H pitch on the predicate : "the fox was sad"(Acoua) (Polytonia).

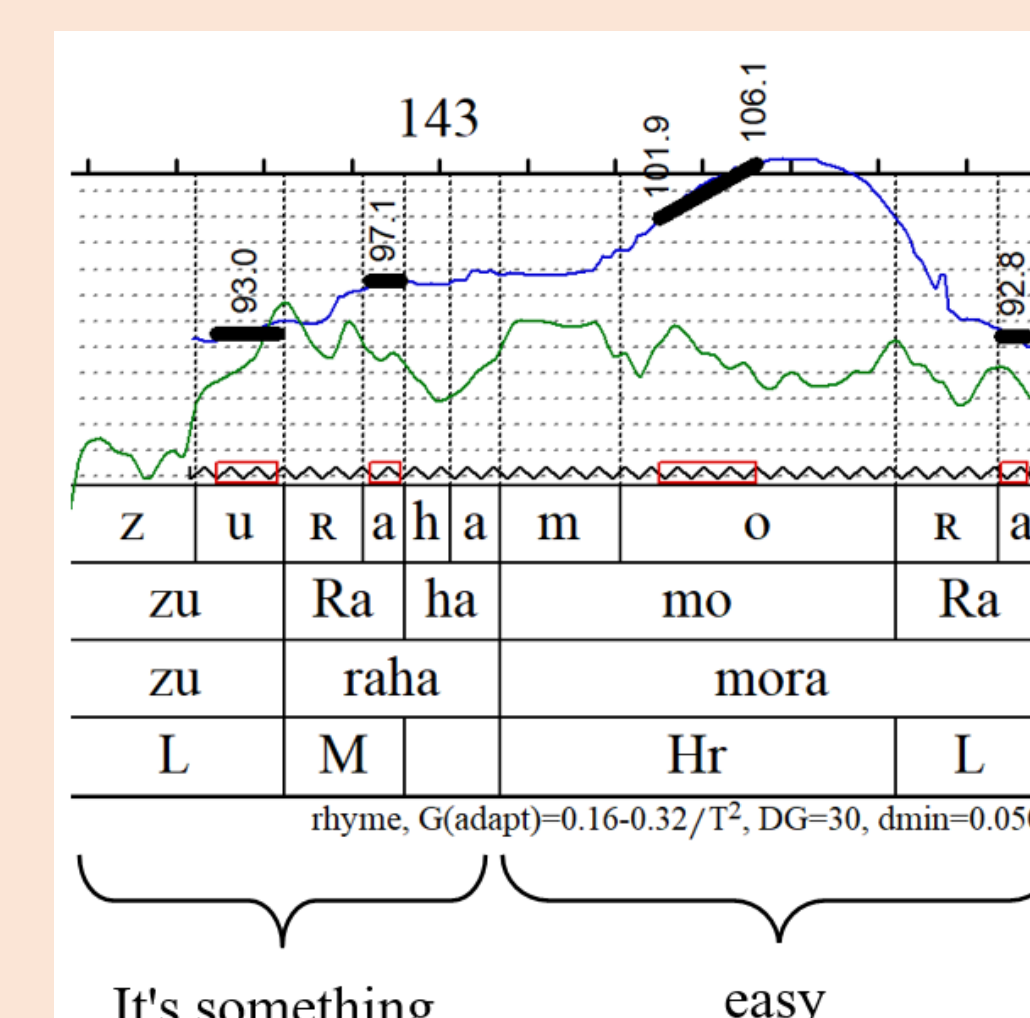


Figure 3: Example of H pitch on a penultimate syllable (Chiconi) (Polytonia).

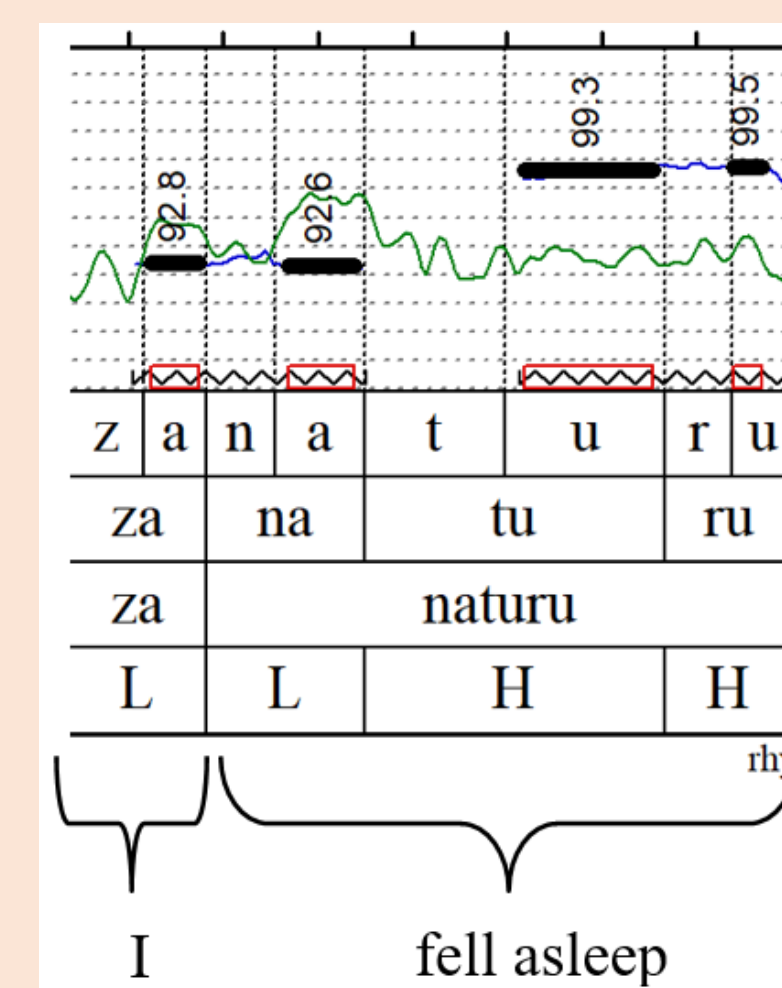


Figure 3: Example of H pitch on the last syllable: (Ouangani) (Polytonia).

### 3. Syllable stress duration

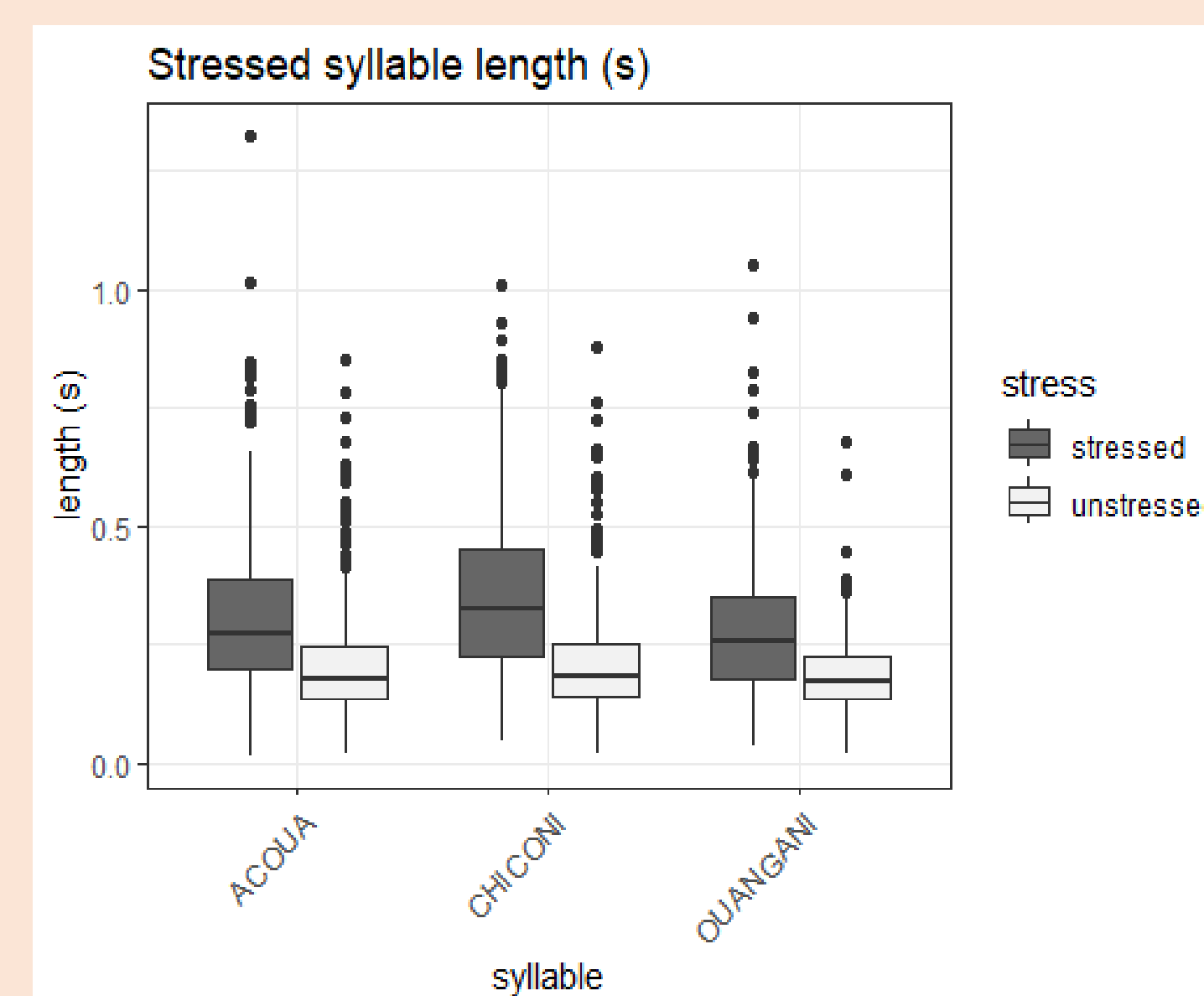


Figure 4: Syllable duration in ms by village.

Stressed syllables exhibit longer durations than unstressed ones across all three villages.

The median duration of unstressed syllables does not significantly differ between the two dialects.

In stressed syllables:

- Chiconi stands out with a notably longer duration (median=324 ms).
- Acoua and Ouangani have slightly shorter median durations (Acoua = 274 ms; Ouangani=256 ms).

## Discussion

Results obtained from the two prosodic parameters, pitch and duration, suggest that Kibushi variation depends on villages and dialects :

- In a reading context, pitch exhibits slight variations. Differences between f0\_min and f0\_max are not significant, and this for all villages and genders.
- The Kiantalautsi dialect (Ouangani) differs slightly from the two Kisakalava dialects (Acoua and Chiconi) in terms of high (H) vs low (L) pitch and the location of H pitch in declarative sentences.

- Syllable stress duration: readers from Chiconi produced longer durations on stressed syllables than those from the other villages. This phenomenon may contribute to the perception by some Kibushi speakers that individuals from Chiconi speak slowly.
- To further enhance our understanding of prosodic variation in Kibushi, future research is essential. Expanding the dataset to include a wider range of declaratives and wh-questions will contribute to a more comprehensive exploration of these findings.

## References

- Bare-Thomas D. (1976). *Le dialecte sakalava du nord-ouest de Madagascar : phonologie, grammaire, lexique*. Linguistic dissertation, Université de Paris V.
- Boersma, P., & Weenink, D. (2019). Praat: Doing phonetics by computer (version 6.1.01). <http://www.praat.org>
- Gueunier, N. (2004). Le dialecte malgache de Mayotte (Comores) : une discussion dialectologique et sociolinguistique. *Faits de Langues*, 23-24, 397-420.
- Insee (2022). Mayotte, un territoire riche de ses langues et de ses traditions. Insee Analyses Mayotte, 33. <https://www.insee.fr/fr/statistiques/6467148>
- Jamet, R. (2016). Dictionnaire kibushi-français, Dzoumogné, Association SHIME.
- Kassime, A. (2021). *Représentations et attitudes autour des variables du kibushi kisakalava et leur place dans un territoire pluri-lingue (Mayotte)*. Mémoire de Master 2, Sciences du langage, Université Rennes 2.
- Kassime, A., Hirsch, F., & Mori, M. (2023). Vowel space and acoustic characteristics of stressed syllables in two kibushi dialects spoken in Mayotte, France: a pilot study. *20th International Congress of Phonetic Sciences (ICPhS 2023)*, Aug 2023, Prague, Czech Republic. pp.3321-3324. (hal-04198178).
- Laroussi, F. (2010). *Langues, identités et insularité. Regards sur Mayotte*. Université de Rouen et du Havre.
- Mertens P. (2014). Polytonia: a system for the automatic transcription of tonal aspects in speech corpora. *Journal of Speech Sciences*, 4(2), 17-57.
- Mertens, P. (2022). The Prosogram model for pitch stylization and its applications in intonation transcription. in Barnes, J.A. and Shattuck-Hufnagel, S. (eds) (2022) *Prosodic Theory and Practice*. Cambridge, MA: MIT Press 259-286. ISBN 978-0-262-54317-0.