ACQUISITION OF TONE AMONG BAMBARA SPEAKING CHILDREN

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INTRODUCTION

ACQUISITION OF AFRICAN LANGUAGES

Drastically understudied (Cissé 2014)

Especially dire for West African languages

- Bambara/Fulfulde (Cissé 2014)
- Yorùbá (Boysson-Bardies 1996, Harrison 2000)
- …?

More studies elsewhere on the continent

- Sotho (Demuth 1989, 1995)
- Swati (Kunene 1979)
- Xhosa (Mowrer and Burger 1991)
- Tswana (Tsonope 1987)
- Tashlhiyt Berber (Larouchi and Kern 2018)

ACQUISITION OF TONE

Also relatively understudied (Singh and Fu 2016)

Vast majority of studies focus on (South) East Asian tone systems

- Mandarin (Li and Thompson 1976)
- Cantonese (So and Dodd 1995)
- etc.
- Very typologically different from African languages (e.g. minimal grammatical tone)

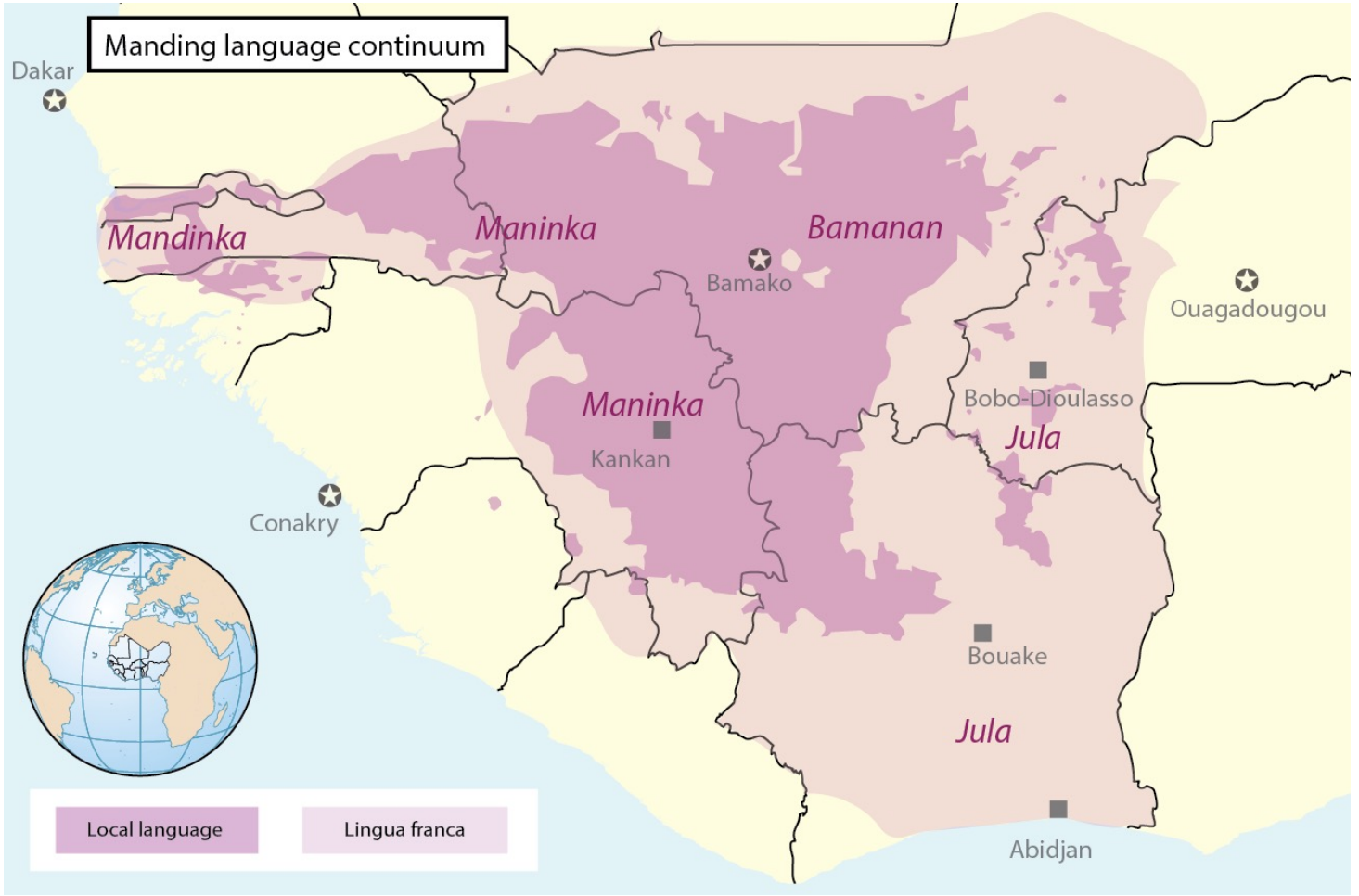
Among African tone languages, only very few studies

- Suzman (1991) on Zulu
- Demuth (1995) on Sotho, where grammatical tone complicated the acquisition of lexical tone in verbs

BAMBARA

Mande, part of the Manding language continuum

Focus on the Bamako dialect (Mali)



BAMBARA TONE

Two-way lexical tone contrast (Courtenay 1974, Dumestre 1984, Green 2010, etc.)

- H vs. L(H)

Grammatical tone

- Floating L definite marker (Bird 1966)
- *Compacité tonale* (see Green 2018 for a comprehensive overview)

➢How do children acquire this tone system?

ROAD MAP

1. Introduction
2. Methodology
    1. Data collection
    2. Tonal analysis
3. Results
4. Discussion

METHODOLOGY

DATA COLLECTION: SUBJECTS

Momo (MK)

MK was born in Bamako in a monolingual Bambara family. He spent most of his time with youngsters aged between 14 and 23 years. His main source of linguistic input came from these youngsters.

Hawa (HS)

HS was born in Bamako in a monolingual Bambara family. She spent most of her time with her mother who was her main source of linguistic input.

Sanata (SD)

SD was born in Bamako in a monolingual Bambara family. She grew up in a family with many children (some of whom are older than her by about 2 years) and women. Her main source of linguistic input were children and women.

DATA COLLECTION: METHODOLOGY

MK, HS and SD's spontaneous productions were collected over 7 months in 2010.

- MK: 1;6-2;1
- HS: 1;11-2;6
- SD: 2;10-3;5

They were recorded for an hour twice a month.

MK was recorded interacting with youngsters (boys and girls).

HS was recorded interacting with her mother.

SD was recorded interacting with peers and women.

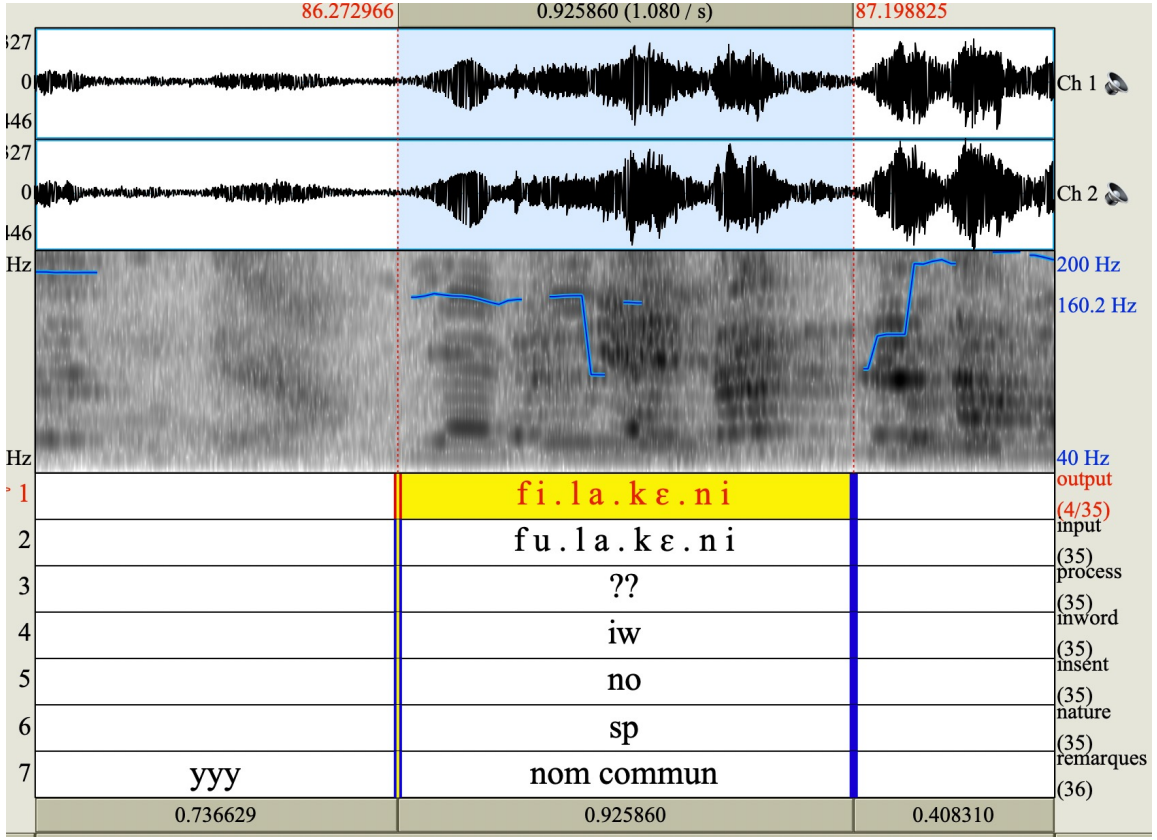
Audiovisual recordings were made using a Tascam RD100 and a Sony Handycam.

ORIGINAL DATA ANNOTATION

Identified target words

Annotated for child's phonetic pronunciation and adult target
- Only segmental information

Informed a study of babbling and acquisition of segmental contrasts (Cissé 2014)



TONAL ANNOTATION

For each word, both McPherson and Zheng listened independently and annotated for tone

- Results of two annotators compared
- Any discrepancies led to a second listen and discussion to reach consensus

Child's pronunciation compared to adult tone classification

- Bambara dictionary (Bambadaba, Bailleul et al. 2020)
- Adult data in the recordings
  - Also annotated independently by McPherson and Zheng
- Remaining tonally unknown words checked by Cissé with Bamako Bambara speaker

Focus on lexical tone (H vs. L-toned words)

TONAL ANALYSIS

Results collated on a month-by-month basis

Measures:

- Percentage correct (token) for L-toned and H-toned vocabulary
- Also kept track of type count

Correct defined as reaching or sustaining appropriate tonal target on first syllable

- e.g. /básá/ 'agama lizard' would be correct with:
  - [mbaˇsà]
  - [mbaˊsà]

Examine the trajectory of correct categorization as the children age

RESULTS

CHILDREN'S UTTERANCES

HS: n = 240

- L – 89
- H – 151

MK: n = 193

- L – 92
- H – 101

SD: n = 124

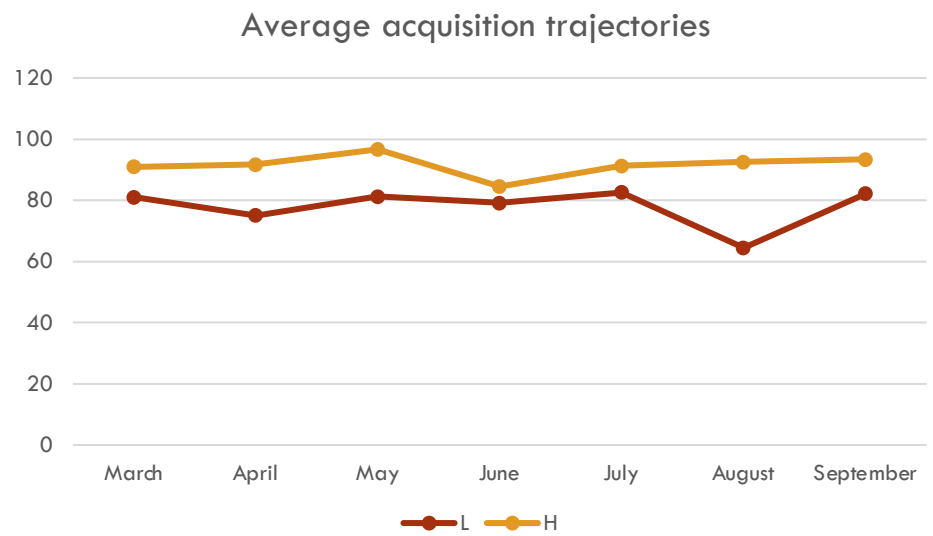
- L – 77
- H – 47

GENERAL OVERVIEW

Data is rather sparse, so all results are preliminary

Overall, better accuracy for H-toned vocabulary

- But not by much



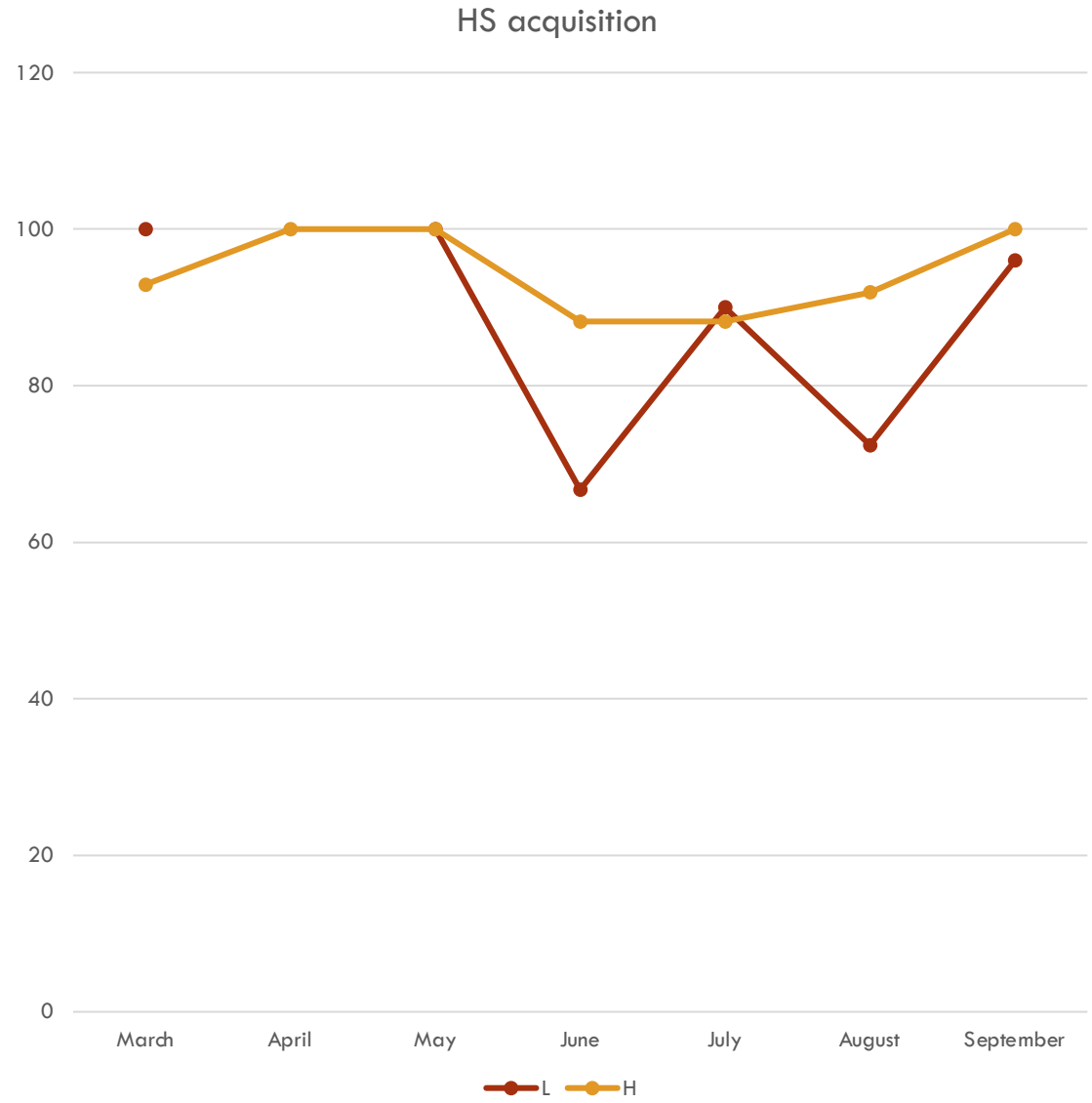
HS

March: 5 L-toned words

April: 0 L-toned words, 1 H-toned word

May: 6 L-toned words

Many early H tones reach the target but “ramp up”

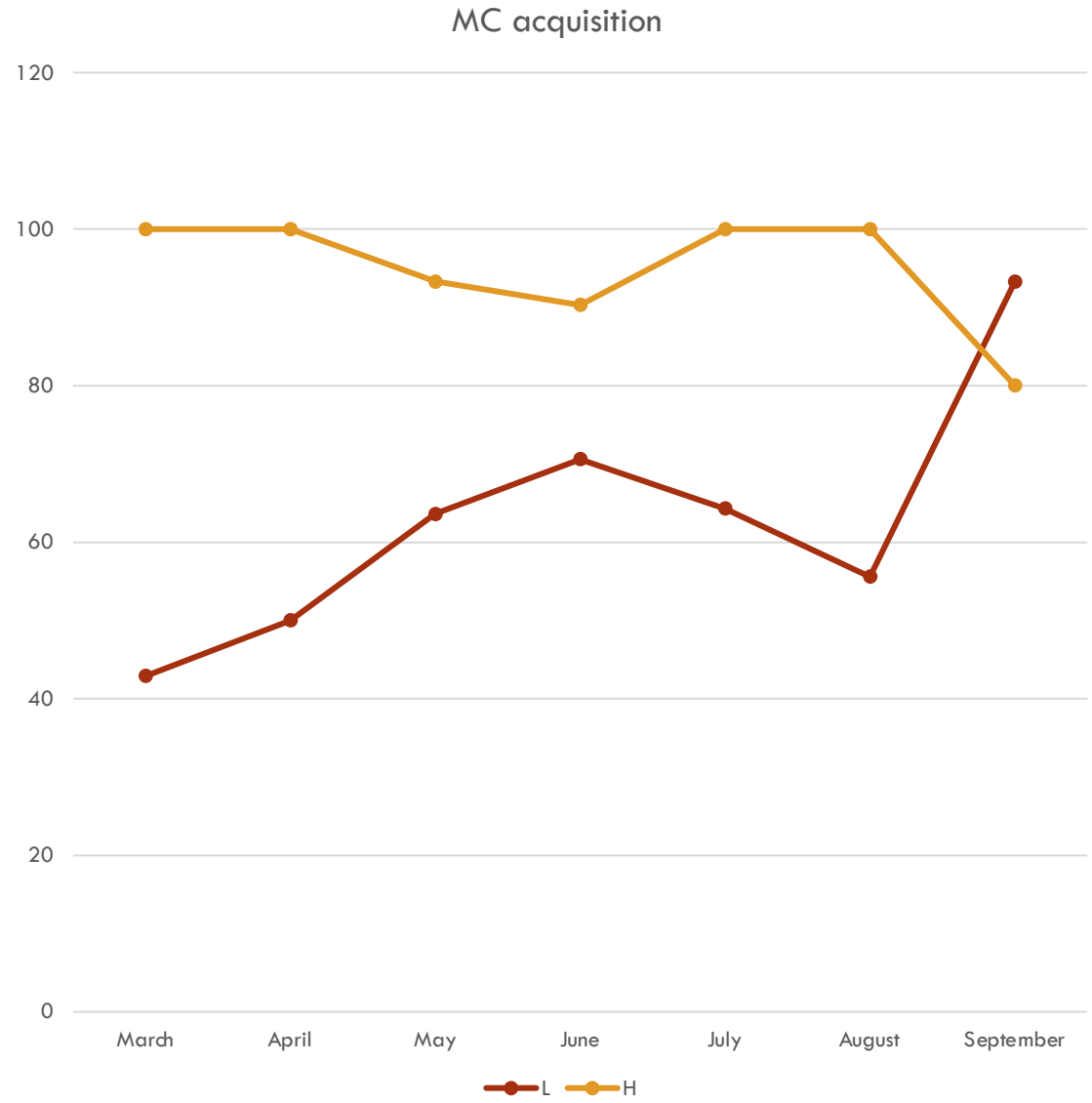


MK

Steady improvement in L-toned vocabulary

Sparse data for March and August

A little ramping up of H tones in proper names, but less than HS



SD

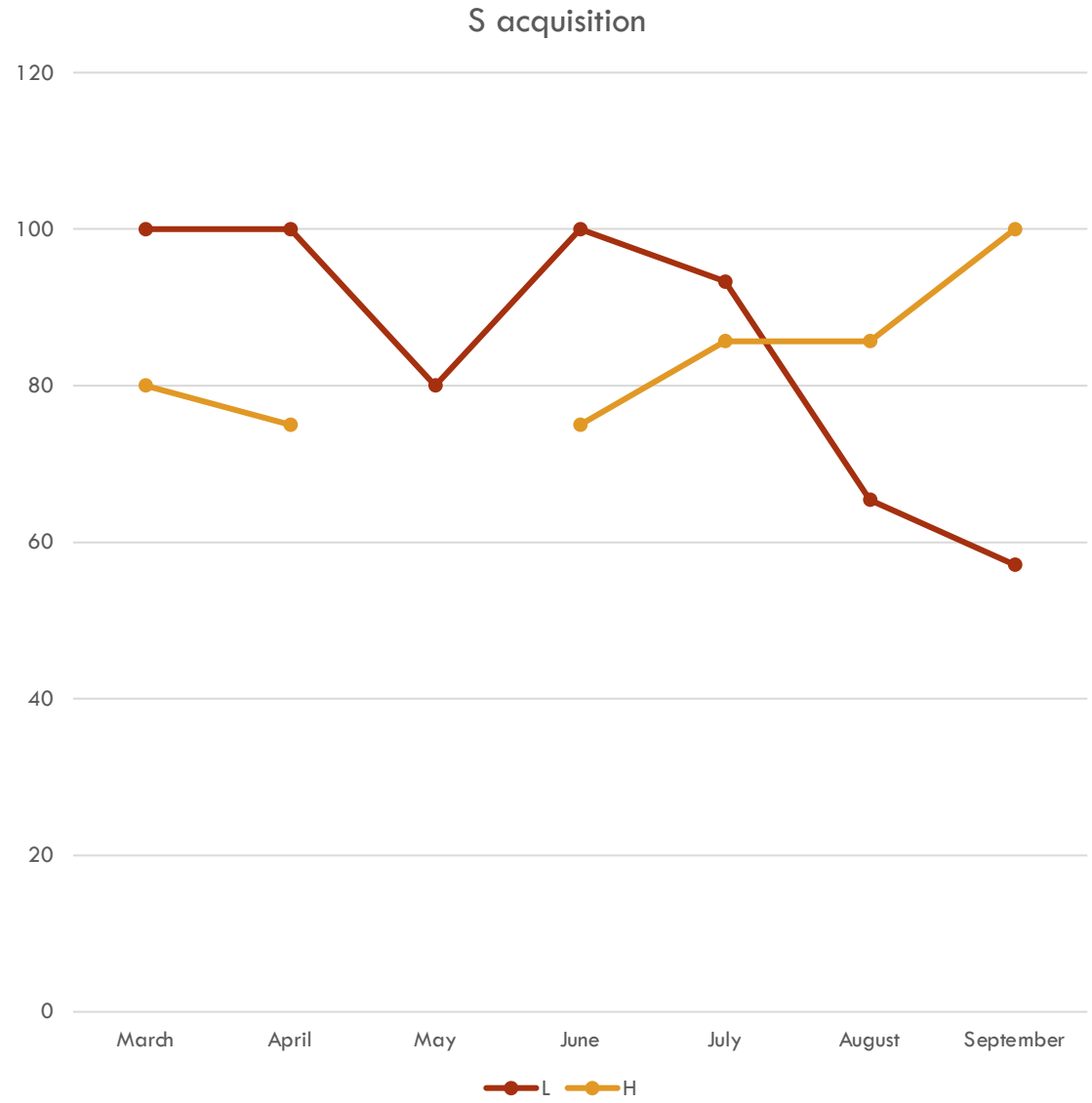
The most mysterious child

Oldest of the children (but spoke the least?)

Actually appears better with L-toned vocabulary

But overall lowest amount of data of any child (n = 124)

- HS, n = 240
- MK, n = 193



DISCUSSION

CHALLENGES

Small sample size

- Both in terms of number of children and number of utterances
- Distribution of L and H differs between the children

Naturalistic data collection

- Data set differed from child to child

Categorizing children's utterances

- Should a LH rise on a first syllable be taken as evidence of a L-toned categorization or a production issue?
- How to characterize level-pitched single word utterances
- etc.

CATEGORIES VS. PRODUCTION

Studies on Cantonese and Mandarin found tone categories were acquired early relatively to segmental contrasts (Li and Thompson 1977, So and Dodd 1995, Hua and Dodd 2000)

- Lexical tone contrasts in place by around 2-2.5 years of age

While tone contrasts are acquired early, accurate (adult-like) production can take years (Wong et al. 2005, Wong 2012)

Our results suggest a similar situation in Bambara

- Few mistakes in the last months of data gathering **-but-**
- Variability in pitch timing
- "Ramping up" to H tones, etc.

H TONES VS. L TONES

Previous studies show H tones are learned earlier cross-linguistically than L tones

- In Mandarin, more confusion between L-toned categories (35 and 214) than H categories (Li and Thompson 1977)
- In Sotho, L/Ø verbs take longer to learn than H verbs (Demuth 1995)
- In Zulu, children overgeneralize H tone on verbs around 2 years of age, before improving in accuracy around 4 (Suzman 1991)

Our results suggest a similar trend in Bambara

- H-toned vocabulary more stable than L-toned
- But SD doesn't fit the trend as well, though her data collection started later than the others

FUTURE WORK

More data from more kids

- *n* too small for significance in the current study

Expanded age range

- Younger to capture the beginning of tonal differentiation, older to capture grammatical tone and multi-word utterances

FUTURE WORK: GRAMMATICAL TONE

Current study only looked broadly at lexical tone

Future should encompass grammatical tone

- When does the floating L definite emerge?
- When does the rule of tonal compactness get learned?
- What kinds of mistakes are made along the way?

Comparative acquisition study in Seenku (Mande, Burkina Faso)

- More complex tonal system (four contrastive levels + many contour tones)
- Extensive grammatical tone, including complex sandhi (McPherson 2019)

Thank you!

Merci!

A ni ce!

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