

Length-based allomorphy in Xhosa noun class prefixes

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Overview

- Certain noun class prefixes in Xhosa (Bantu, Nguni, South Africa) alternate based on the length of the following root
- **The Question:** are these alternations synchronically productive, or just the remnant of historical change?
- We argue that these alternations are part of speakers' synchronic grammars

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Length-based allomorphy in class 10

- Class 10:
 - izi(N)- before 1-syllable roots
 - ii(N)- elsewhere

Singular (9)	Plural (10)	Gloss
in- <u>to</u> [int'o]	iz <u>in</u> - <u>to</u>	'thing(s)'
in- <u>dlu</u> [indʒu]	iz <u>in</u> - <u>dlu</u>	'house(s)'
in- <u>dlela</u> [indʒela]	i <u>in</u> - <u>dlela</u>	'road(s)'
in- <u>tombi</u> [int'ombi]	i <u>in</u> - <u>tombi</u>	'girl(s)'

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Length-based allomorphy in class 5

- Class 5:
 - ili- before 1-syllable roots
 - i- elsewhere

Singular (5)	Plural (6)	Gloss
ili- <u>fu</u> [ilifu]	ama- <u>fu</u>	'cloud(s)'
ili- <u>tye</u> [ilice]	ama- <u>tye</u>	'stone(s)'
i- <u>cephe</u> [i ep ^h e]	ama-cephe	'spoon(s)'
i- <u>dada</u> [idada]	ama-dada	'duck(s)'

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Length-based allomorphy in class 11

- Class 11:
 - ulu- before 1-syllable roots
 - u- elsewhere

Singular (11)	Plural (10)	Gloss
ulu- <u>vo</u> [uluvo]	izim- <u>vo</u>	'opinion(s)'
ulu- <u>su</u> [ulusu]	izin- <u>tsu</u>	'skin(s)'
u- <u>phondo</u> [up ^h ondo]	iim-pondo	'horn(s)'
u- <u>cango</u> [u ango]	iin-gcango	'door(s)'

Theoretical import

- Other robust cases of length-based allomorphy are mostly metrical in nature
- Ex: Sharanawa (Gonzalez 2005; Faust & Loos 2002:132)
 - (ka-pa)-ni go-down-remote past 'Went down'
 - (ke.ne)-(pa.ke)-ni write-in order-remote past 'Wrote in order'
 - -pa- after odd
 - -pake- after even
- The Xhosa case isn't so obviously metrical
 - Not iterative; it's about minimality
 - Some alternations don't involve moras (iin-/izin-)

Possible representations

- Remnant of a historical process; only in the lexicon (learned for each word)
 - ↳ Speakers *shouldn't* apply the pattern to novel words or nonce items
- Synchronic phonological pattern; active in the grammar (learned as a rule)
 - ↳ Speakers *should* apply the pattern to novel words or nonce items

Experiment 1

Wug-testing length-based
allo-morphy

Experiment design

- Wug task (Berko 1958)
 - Singular ↔ Plural
- Block 1: ii(N)- vs. izi(N)- (9/sg → 10/pl)
- Block 2: i- vs. ili- (6/pl → 5/sg)

Participants

- 10 native speakers of isiXhosa
 - 5 male, 5 female
 - Age
 - Range: 21–42
 - Mean: 26
 - Other languages
 - English (≈all)
 - Afrikaans (2)
 - Zulu (2)
 - Sotho (2)



Data capture

- Stimuli presented on a laptop in random order
- Participants saw 3 real-noun sg/pl examples in the instructions, then did 14 practice items
- Audio recorded, responses coded for class prefix added

Block 1 (class 9/sg. → 10/pl.): Stimuli

- Singular class 9 → plural class 10
 - 10 monosyllabic roots
 - 10 disyllabic roots
 - 20 filler/distractor items (part of a separate experiment)
 - 10 monosyllabic, 10 disyllabic

Block 1: Task

- Block 1 (9/sg. → 10/pl.)
 - On each trial, speakers see a singular nonce noun with the class 9 prefix i(N)-
 - Speakers produce the plural of that nonce noun, with one of the two class 10 allomorphs, izi(N)- or ii(N)-

Block 1 (9/sg. → 10/pl.): Examples

- into → izinto or iinto
- indlu → izindlu or iindlu
- indlela → izindlela or iindlela
- intombi → izintombi or iintombi

Block 2 (class 6/pl. → 5/sg.): Stimuli

- Plural class 6 → singular class 5
 - 10 monosyllabic roots
 - 10 disyllabic roots
 - distinct from block 1
- 20 filler/distractor items (part of a separate experiment)
 - 10 monosyllabic, 10 disyllabic
 - distinct from block 1

Block 2: Task

- Block 2 (6/pl. → 5/sg.)
 - On each trial, speakers see a plural nonce noun with the class 6 prefix ama-
 - Speakers produce the singular of that nonce noun, with one of the two class 5 allomorphs, ili- or i-

Block 2 (6/pl. → 5/sg.): Examples

- amafu → ilifu or ifu
- amatye → ilitye or itye
- amacephe → ilicephe or icephe
- amadada → ilidada or idada

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Results

- In both blocks, speakers' knowledge of length-based prefix alternations extends to novel words

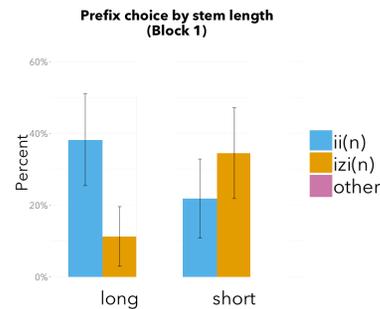
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Results: Block 1 (9/sg. → 10/pl.)

- Speakers were more likely to use izi(N)- with short roots and ii(N)- with long roots



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The “other” category

- Real class prefixes, but not izi(n)- or ii(n)-
- Most common: ama- (class 6 pl.)
- Two likely reasons for ama- responses
 - i-CVCV forms may be ambiguous between class 5 i(li)- and class 9 i(n)-
 - Some frequent nouns in class 9 have class 6 plurals (a 9/sg.~6/pl. paradigm exists)
ex: in-doda → ama-doda ‘man’ / ‘men’

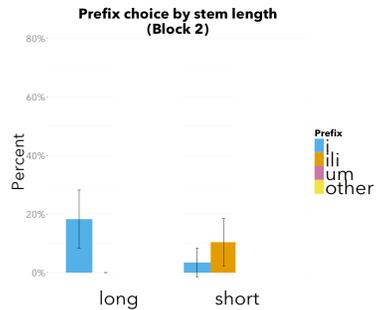
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Results: Block 2 (6/pl. → 5/sg.)

- Speakers were more likely to use ili- with short roots and i- with long roots



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um-

- “Other”: responses other than i- and ili-
- Most common responses:
 - um- (class 1 or 3)
 - u- (class 1a or 11)
- A likely explanation for um-s:
 - Most clan names and other ethnonyms follow an irregular 1/sg. → 6/pl. paradigm
 - ex: um-Xhosa → ama-Xhosa
'Xhosa person/people'

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Statistics

- Linear mixed model regressing prefix choice against root length with participant and item as random effects
- Combined Block 1 and Block 2
 - With “other” responses: $t = 0.915$, *ns.*
 - Without “other” responses: $t = 4.841$, $p < 0.001$

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Experiment 2

Forced-choice follow-up

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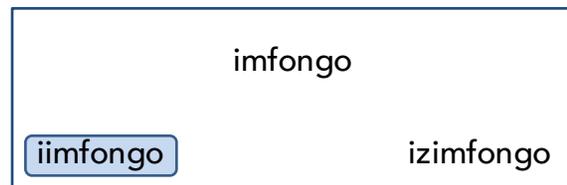
Why forced choice?

- “Other” responses cloud interpretation
- Participants must decide between two given forms, with no “other” options

Experiment design

- Given a singular form, select one of two possible plural forms
- Just one block (all 9/sg. → 10/pl.)
- 60 trials
 - 30 long roots
 - 30 short roots

Experiment 2: Examples



Participants

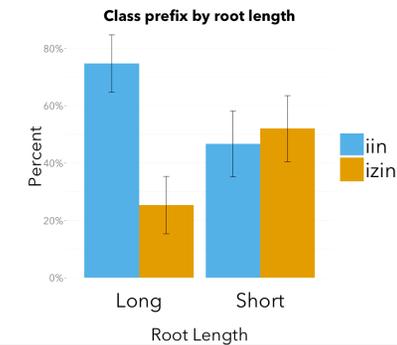
- Native speakers of Xhosa in South Africa
- 8 in-person via Superlab (3 thrown out due to interference during testing)
- 9 online via Moodle online survey
 - 34 logins, 9 complete responses

Results

- Both online and in-person, participants showed knowledge of the length-based alternation
- The effect is more pronounced online than in-person
- Linear mixed model regressing prefix choice against root length with participant and item as random effects:
 - In-person: $t = 3.212$, $p < 0.01$
 - Web: $t = 6.561$, $p < 0.001$

Results: In-person

- Speakers were more likely to use izi(N)- with short roots and ii(N)- with long roots



Results: Web

- Speakers were more likely to use izi(N)- with short roots and ii(N)- with long roots



Web vs. In-person

- Self-selection:
 - All in-person participants completed the task
 - Many web participants stopped part way through
 - Because they lacked clear intuitions?

Summary and Conclusion

Summary

- Xhosa speakers use root length to decide between class prefix allomorphs
- This alternation is represented in speakers' synchronic grammars

Conclusion

- The length-based alternations are not just a historical vestige
 - Speakers have some linguistic awareness of length as the basis for the allomorphy
 - They can extend that knowledge to the treatment of novel words; it's not lexicalized

Conclusion

- Length-based allomorphy can be synchronically active even when its motivation is historical, rather than phonologically/phonetically motivated
 - Bisyllabic minimality as driving factor?
 - *iin-* ~ *izin-*: no difference in mora count
 - Prefix usually doesn't count for minimality of stem, but seems to do so here.

Thanks!

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