Phonology or Morphology:
Inter-speaker differences in
Xhosa Labial Palatalization
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Introduction to the pattern

• Labial palatalization in Xhosa (Bantu)
• Passivizing suffix: /-w/
• Root bilabials palatalize when preceding the passive suffix /-w/

Schematically:
\[ /B/ + /-w/ \rightarrow J-w \]
labial +labial \rightarrow palatal (!) + labial

Introduction to the pattern

• Normal structure for passive verbs:
  • uku-fu’d-a ‘to study, read’
  • i-ja-fu’d-w-a ‘it is being studied’ (passive = /-w/)
• Palatalization in passives containing bilabials:
  • uku-ɓam-b-a ‘to wash’
  • i-ja-ɬa’i-ɬ-d-w-a ‘it is being washed’ (%b \rightarrow \%d\z)
  \rightarrow NOT *ija’ɬa’iwa

It’s atypical for palatalization…

• Apparent universals of palatalization:
  (from Bateman 2007, Kochetov 2011)
  1. If labials palatalize, then coronals/dorsals do too
  2. If back vocoids cause palatalization, then front vocoids do too
• ...But in Xhosa:
  • In passive verbs, **only bilabials change**
    ija’vu’dwa \rightarrow *ija’vudwa
  • Only [w] causes palatalization (not [i] or [j])
    ijak’o’gisa \rightarrow *jak’o’gisa
    ijaɓu’ja \rightarrow *jaɓu’ja

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…It’s also phonetically “unnatural”

• [w] has no palatal constriction
  • Expectation: [w] should reinforce the labiality of labials rather than palatalize them (Ohala 1978)
• When the passive suffix surfaces as [-iw] (in monosyllabic roots), palatalization does not apply:
  • uku-ːm-a ‘dig’  i-jaːm-ːiw-a ‘it is being dug’

→ Why should palatalization occur (only) in the absence of anything like a palatal?

The puzzle

• How does the pattern in Xhosa really work?
  • One view: it’s a phonological process
    • [LAB] → [COR. -ant] / _w (in various formulations)
  • Alternative view: it’s really not phonology
    • It’s a historical relic, and/or morphological in nature

Structure of the talk

1. Background from the literature
2. Our experiment
3. Data and results
4. Analysis and discussion
5. Summary and conclusion

1. Background and context
About isiXhosa

- Xhosa; Southern Bantu language, Nguni group
- Prototypically spoken in Eastern Cape in South Africa (≈5m speakers, out of ≈8.2m speakers total)

Labial palatalization (1/2)

- Labials shift to the nearest palatal equivalent (other features mostly stay the same)
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  - $[p'] \rightarrow [tʃ']$
  - $[pʰ] \rightarrow [tʃh]$
  - $[b] \rightarrow [c']$
  - $[bʱ] \rightarrow [dʒh]$
  - $[m] \rightarrow [ɲ]$
  - $[mʱ] \rightarrow [ɲdʒ]$

Labial palatalization (2/2)

- Found in a few morphological contexts
  - Passive /-w/, locative suffix /-ini/, diminutive /-ana/
  - Passive /-w/, locative suffix /-ini/, diminutive /-ana/ (We’ll only talk about passives for now)
  - Also evident in historical changes:
    - Proto-Bantu mbwa > Xh. iɲdʒa ‘dog’
  - Sometimes long-distance
    - seʃenza ‘work’ → secɛnzw’a ‘be worked’
  - Why: previous literature is mixed

Explanation #1: phonology

- A synchronic phonological process turns labials into palatals
  - One version: Labial dissimilation
    - Avoidance of two Labials; supported by absence of Bw elsewhere
  - Another version: a floating palatal feature, or assimilation to a covert /i/ or /j/
Explanation #2: history

- A string of historical changes
  /p+jw/ → pʃw → pʃw → tʃw → /tʃ/  
  - Passive suffix /-w/ used to have a front glide [j]  
  - Voicelessness of [p] gets extended, devoices the [j]  
  - Voiceless glide [j] misperceived as a fricative [ʃ]  
  - Labial component of [pʃ] is reanalyzed as an coarticulatory effect of following [w]
- End result: active verb has /p/, passive has /tʃ/  
  (similar pathway for other bilabial sounds)

History → ¬Phonology

- For the historical account, palatalization is NOT necessarily an active part of phonology
  - Speakers learn active forms with labials, learn passive forms with palatals, switch them as needed  
- Both good and bad sides to this story:
  - Phonological changes involved are weird; but the historical steps are very reasonable, and some intermediate steps are attested in dialect variation  
  - Doesn’t clearly explain forms where palatalization is long-distance, e.g. sebenza ~ sec enzwa

Recap: two competing hypotheses

- **Phonological hypothesis**: Palatalization is part of the phonology of the language; learned as a rule
- **Lexical hypothesis**: Palatalization is in the lexicon, not phonology; no rule for the change

Recap: two competing hypotheses

- If palatalization is **phonological**, then speakers will apply the change in novel words
- If palatalization is just in the **lexicon**, speakers will NOT apply the change in novel words
- A wug test (Berko 1958) should tease them apart
2. Our Experiment

Method: stimuli

- 40 nonce verb roots, all with CVC structure
- Vowels were all either /a/ or /o/
- Last consonant {mb, m, nj, ny} = [mb, m, ɲdʒ, ɲ]
- Ex: hlama, famba, foma, komba
- 40 real verbs, used as fillers
- Stimuli shown to speakers on a laptop, in randomized order
- Participants saw 3 real verb examples in the instructions, and did 9 practice items first

Method: task

iya-famba → iya___wa

- Task: fill in the blank
- Stimuli presented in a frame typical of active verbs (in Xhosa orthography)
- Speakers read the active form, then made a passive form of the verb
- Participants were instructed that some words might be unfamiliar, and that they should take their best guess at what sounds most natural

Method: participants

- 10 native speakers of isiXhosa
- 5 male, 5 female; Age range 21–42 (mean =26)
- 9 from Eastern Cape; 8 grew up at least partly in Grahamstown
- All 10 identified Xhosa as the language they spoke the most at home
- Other lgs: English (everyone), Afrikaans, Zulu
- Participants also did 2 other experiments in the same session (order of tasks was counterbalanced)
Method: recordings and coding

- Speakers were recorded using a 'head'-mounted microphone, in the sound laboratory of the Rhodes University linguistics department
- Responses were coded for:
  - target consonant palatal?
  - appropriate application of passive /-w/
- Analysis excluded forms with reading errors, and those that didn’t add [-w] in the passive form

3. Data and results

Q1: Do speakers ever palatalize in nonce words?

- Average over all speakers: palatalize in ~60% of trials
- Answer: Yes!

Binomial test: proportion of palatalized tokens (.575) is greater than expected (.5), p < .05 (1-sided)

Effect of final consonant

- /mb/ vs. /m/: no significant effect
- Speakers didn’t treat the different labial consonants differently

Two-sample proportions test: proportion of /mb/ tokens palatalized (.793) is not significantly different from proportion of /mb/ tokens palatalized (.793)
Cross speaker differences

- Differences between speakers are extreme
- Rate of palatalization ranges from 100%...
  ...to 0%

Long-distance productivity?

- Is palatalization also productive in long-distance cases?
- Some speakers added the suffix /-is/ into passive forms; this separates the [-w] from the root
  iyakhoma → iya___wa  ‘iyakoniswa’
- Speaker 4 palatalized ~50% of time overall
  - 14/20 labial forms had something added before /-w/
  - 7 of those had palatalization, 7 did not
  - ~50% palatalization rate in long-distance cases
- Tentative answer: yes?

Which hypothesis is right?

- The phonological hypothesis predicts speakers WILL apply palatalization to nonce words
  - Speakers 1, 2, 3 bear this out: 100% palatalization
  - Speakers 6 & 8 are close too: ~70% palatalization
- The lexical hypothesis predicts that speakers will NOT apply palatalization to nonce words
  - Speaker 7 bears this out: 0% palatalization of labials
  - Speakers 9 & 10 are similar: < 30% palatalization

4. Interpretation and discussion
What does it mean?

- For some speakers, palatalization is phonological
  - Speakers couldn’t have memorized palatalized forms for nonce words they’d never heard
  - Speakers who systematically palatalize nonce words must be applying a general phonological rule

- For other speakers, palatalization is lexical
  - ‘Non-palatalizing’ speakers DID still palatalize in at least some of the real-word practice and filler items
  - They DO use palatalization sometimes, but apparently only in words that they already know
  - Palatalized forms are lexically stored

Analogy?

- Speakers who palatalize ~100% → phonological
- Speakers who palatalize ~0% → lexical

- Speakers in the middle → analogy strategy?
  - Don’t have a clear phonological rule
  - Don’t just have palatalization lexically stored
  - They palatalize nonce words by analogy with words they already know

Speaker 5 (~30%) by ending

<table>
<thead>
<tr>
<th>Trials palatalized/not palatalized</th>
<th>Percent of Trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>ama</td>
<td>10%</td>
</tr>
<tr>
<td>amba</td>
<td>75%</td>
</tr>
<tr>
<td>oma</td>
<td>25%</td>
</tr>
<tr>
<td>omba</td>
<td>10%</td>
</tr>
</tbody>
</table>

5. Summary and conclusions
Summary

- We’ve wug-tested labial palatalization
  - It’s productive for some speakers, not others
  - This suggests that it’s a genuine phonological pattern for some speakers, but not for others
- The different accounts of palatalization proposed in previous work are both right for some speakers, but not for all of them
- This variation does not appear to correlate with any of the sociolinguistic factors we asked about

Broader implications

- A single linguistic pattern can be learned/analyzed very differently by different speakers
- Xhosa labial palatalization is typologically unusual. But the reason for this weirdness ISN’T that it’s really a morphological pattern.
  - It’s genuinely phonological for at least some speakers
  - This means that even ‘phonetically unnatural’ patterns can be learned as real phonology

Siyabulela!

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References

References (cont.)


