Wug-testing bilabial palatalisation in isiXhosa passivized verbs

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Introduction

- The phenomenon: Xhosa bilabial palatalization
  - uku-fund-a ‘to study, read’
  - i-ya-fund-a ‘it is studying’
  - i-ya-fund-w-a ‘it is being studied’ (passive = /-w/)
  - uku-hlamb-a ‘to wash’
  - i-ya-hlanj-w-a ‘it is being washed’ (mb → nj)

- /B/ + /-w/ → /J-w/ labial + labial → palatal + labial

As palatalization, it’s unusual

- Two apparent universals of palatalization:
  (based on surveys by Bateman 2007, Kochetov 2011)
  1. If labials palatalize, alveolars and/or velars do too
  2. If [w] causes palatalization, so does [j] (or [i])

- But that’s not what we see with isiXhosa passives
  - In passive verbs, only bilabials change
    iyafundwa → *iyafunjwa
  - Only [w] causes palatalization (not [i] or [j])
    iyakroisa → *iyakrotisja

The puzzle

- How does the pattern we find in Xhosa work?
  - One view: it’s a phonological process
    - /mb/ → [ndʃ] before [w] (in various formulations)
  - An alternative view: it’s not really phonology
    - /B/ + /-w/ labial + labial → /J-w/ labial + labial
  - This talk presents some results from a new experimental study on this issue

- /B/ + /-w/ labial + labial → /J-w/ labial + labial
  - NOT *iyahlmbwa

- /B/ + /-w/ labial + labial → /J-w/ labial + labial
  - Palatal, not labial!
9/3/15

Structure of the talk

1. Background from the literature
2. About our study: aims and methodology
3. Data and results
4. Analysis and discussion
5. Conclusions and ramifications for future work

1. Background and context

Labio-pal: some more details (1/2)

- The what: a constellation of changes
  - \([p'] \rightarrow \{t\}'\)
  - \([p^h] \rightarrow \{t\}'\)
  - \([b] \rightarrow \{t\}'\)
  - \([b^h] \rightarrow \{d\}'\)
  - \([m] \rightarrow \{n\}\)
  - \([=b] \rightarrow \{d/\}'\)
  - \([m^b] \rightarrow \{n/\}'\)

- Related things happen in related lgs, with some slight differences in what changes to what
  - Ex: \([b] \rightarrow \{c\}'\) in Xhosa, vs. \(\rightarrow \{t\}'\) in Zulu

Labio-pal: some more details (2/2)

- The where: found in a few morphological contexts
  - Passive /-w/, locative suffix /-ini/, diminutive /-ana/
  - Passive /-w/, locative suffix /-ini/, diminutive /-ana/
  - Today I’m only going to talk about passive verbs
  - Also evident in historical changes
    - Proto-Bantu \(mbwa \rightarrow Xh. \inj'a\) ‘dog’
    - Sometimes long-distance
      - sehenza ‘work’ \(~ setyenzwa ‘be worked’\)
    - The why: previous literature gives a few different explanations
One explanation: phonology

- Doke (1954:39): "Palatalization is a phonological process" 
  "...palatalization is generally due to the incompatibility of bilabial consonants with the semi-vowel w."
- Key points:
  - It’s a process (implies systematicity; part of the regular rules of the language)
  - Due to 'incompatibility of bilabials with [w]' implies dissimilation; problem is two bilabials together
  - Other phonological analyses take other approaches, e.g. assimilation (Khumalo 1987, Naidoo 2002)

Another account: history (1/2)

  \[pjw \rightarrow pjw \rightarrow pjw \rightarrow tfw \rightarrow /tf/\]
- Starting point: /-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 [pj] is reanalyzed as an accidental effect of the following [w]
- End result: active verb has [p], passive has [tf]
  (similar pathway for other bilabial sounds)

Another account: history (2/2)

- For the historical account, palatalization is NOT necessarily an active part of phonology
  - Speakers learn active forms with labials, and passive forms with palatals
  - They switch out one for the other as needed
- Both good and bad sides to this story:
  - Phonological changes involved are weird; but the historical steps are attested in dialect variation
  - Doesn’t clearly work for words where palatalization happens across other sounds (e.g. sebenza ~ setyenzwa)

Recap: two competing hypotheses

- Phonological hypothesis: Palatalization is part of the phonology of the language
  - Speakers learn it as a rule that changes labial consonants into palatal ones
- Morphological hypothesis: Palatalization is in the lexicon, not phonology
  - There is no change in the synchronic phonology
  - Speakers memorize palatalized verb forms (like suppletive forms, e.g. go/went, swim/swam)
2. Our Experiment

Our experiment: overall design

- The two hypotheses make different predictions about how speakers will treat unfamiliar words
- If palatalization is part of phonology, then speakers will apply the change in new words
- If palatalization is just a trend in the lexicon, speakers will NOT apply the change in new words
- A ‘wug test’ should tease them apart

Method: stimuli

- 40 nonce verb roots, all with CVC structure
  - Vowels were all either /a/ or /o/
  - Last consonant {mb, m, nj, ny}
- 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 and presentation

iyafamba → iya____wa

- Task: fill in the blank
  - Stimuli were presented in a morphological frame typical of active verbs (in Xhosa orthography)
  - Speakers asked to read the active form, and then to make 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, 1 from Gauteng (but with family in Eastern Cape)
  - All 10 identified Xhosa as the language they spoke the most at home
  - None reported medical issues related to speech or hearing
  - Participants also did 2 other experiments in the same session (order of tasks was counterbalanced)

Method: data handling

- Speakers were recorded using a ‘head'-mounted microphone, in the sound laboratory of the Rhodes University linguistics department
- Responses were coded for:
  - whether the target consonant was palatal
  - Morphology added to the verb (usually -w)
- Statistical analysis excluded forms with reading errors, and those that didn’t have the suffix [-w]

Q1: Do speakers ever palatalize?

- Key:
  - Dark = palatal
  - Light = not
- Average over all speakers: palatalize in ~60% of cases
- Answer: Yes!
Rate of palatalization (1/2)

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

Q2: Long-distance palatalization

- Some speakers added the suffix /-is/ into passive forms; this separates the [-w] from the root iyakoma → iya____wa ‘iyakonyiswa’
- Q2: is palatalization also productive in these long-distance cases?
- Speaker 4 palatalized ~50% of time overall
- 14 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?

Rate of palatalization (2/2)

- Big differences between speakers!
- Some palatalized 100% of the time
- Some speakers palatalized never
- Some speakers fall in between

4. Interpretation and discussion
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

What’s it mean?

- For some speakers, palatalization is phonological
  - Nonce words are unfamiliar: speakers couldn’t have memorized palatalized forms for them
  - So, speakers who 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
  - So, they DO use palatalization (to at least some extent); but apparently only in words that they know
  - This fits with palatalized forms being lexically stored

5. Summary and conclusions

- We’ve wug-tested labial palatalization
  - It’s productive for some speakers, not for 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
Broader implications

• A single linguistic pattern can be learned/analyzed very differently by different speakers
• ...even speakers from the same speech community!
• This suggests that experiments of this sort should avoid pooling data across speakers
• Xhosa labial palatalization is typologically unusual ...but this ISN’T because it’s non-phonological
• It’s genuinely phonological for at least some speakers
• This means that even ‘phonetically unnatural’ patterns can be learned as real phonology

Plans for future work

• ’Q3’: When labials get palatalized, do they end up exactly like underlying palatal consonants?
• ’Q4’: are there phonetic differences between the two groups of speakers?
• We’re working on these in our data right now
• More future plans: (tentative)
• Repeat the experiment in other dialect areas
• Other tasks: forced choice, and rating
• Test L2 speakers, see if they pattern like L1s
• Test palatalization in other contexts (loc, dim)

References

Preliminary acoustic data (1/2)

Preliminary acoustic data (2/2)