



# Revisiting Central Ngwi tones: a computational approach



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## 1. Background

- Bradley (1977) proposed a subgrouping of Northern, Central, and Southern Ngwi based on a series of tone changes and put forth reconstructions for **Proto-Ngwi (PN)** tones:
  - \*1 high, modal      \*H mid stopped
  - \*2 low, breathy    \*L low stopped
  - \*3 mid, creaky
- Little comparative work has been done on **Central Ngwi (CN)** and its proposed tone changes since Bradley (1977)
- Two** proposed tone changes for **CN**:
  - PN tone \*2 splits to higher pitched reflexes of \*glottal-prefixed initials and lower pitched reflexes of \*non-glottal-prefixed initials;
  - High/rising pitch reflexes of numerous PN tone \*L \*prefixed \*stop initials

## 2. Research Questions

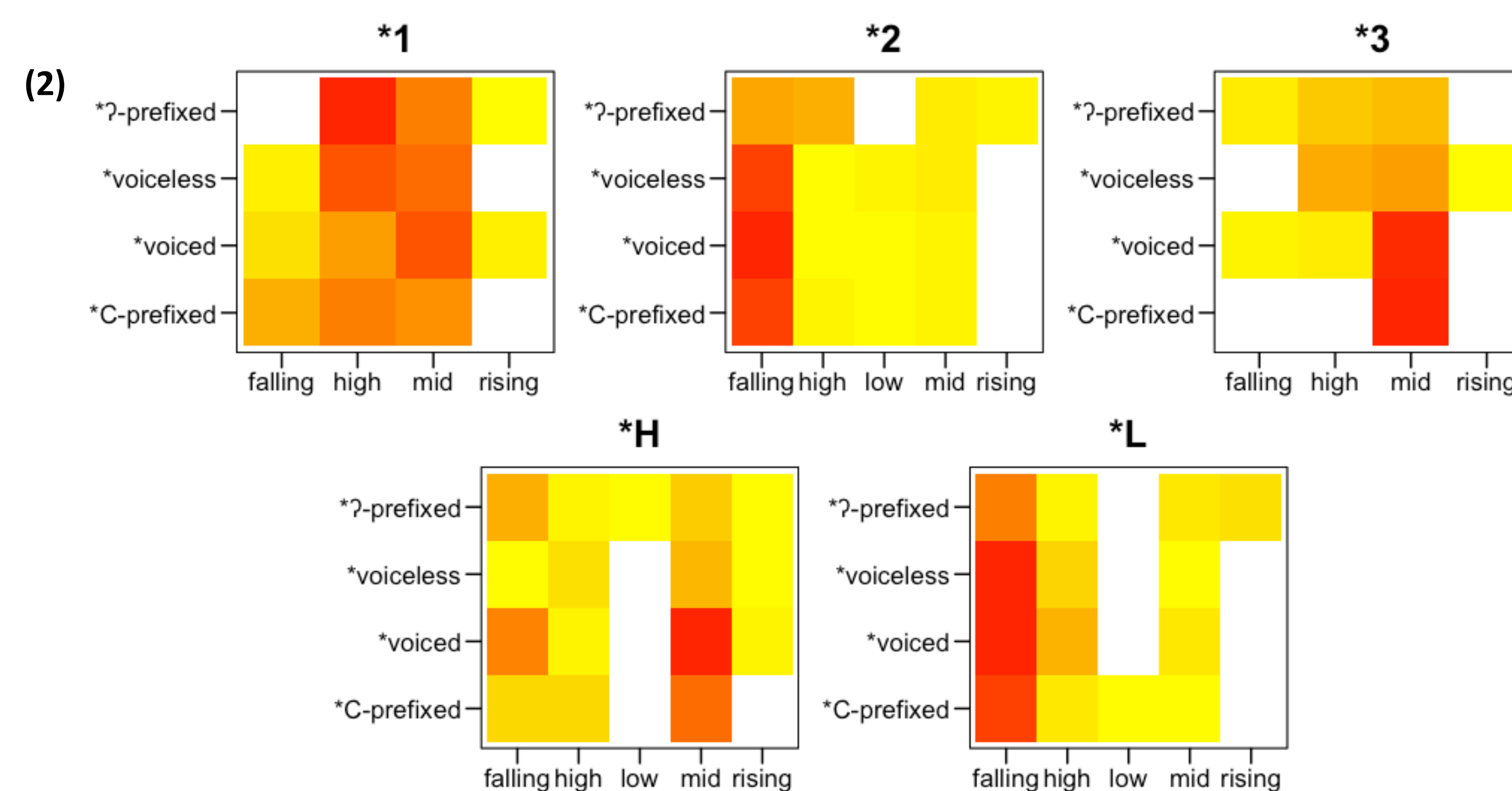
- Can shared tone changes be used to subgroup Ngwi languages into Central Ngwi?
- Can tones be reconstructed for **Proto-Central Ngwi (PCN)**?

## 3. Method

- Lexical data collected from **23** Ngwi languages, **21** grouped into CN and one language from Southern and Northern Ngwi for comparison (**1**)
- Basic vocabulary of **~200 words** comprised of mostly terms for body parts, animals, and verbs, based on the assumption that such words are less susceptible to borrowing (Tadmor et al. 2010, Lama 2012)
- ~130 cognate sets** extracted from which tone-onset correspondences were established
- Applying the **Tonal Comparative Method (TCM)** (Dockum 2019), tone-onset correspondences used to establish any shared tone changes
- Python** used to sort through tone-onset correspondences to ascertain shared tone changes across the 21 CN languages

| (1)      | Sub-branch | Cluster               | Languages and References   |
|----------|------------|-----------------------|--|
| Central  |            | Lisoid                | Yongsheng Lisu (Mu & Sun 2012); Lisu (Sun, et al. 1991)  |
|          |            | Lahoid                | Yellow Lahu (Chang 1986); Black Lahu (Sun, et al. 1991); Kucong (Dai & Chang 2009)                           |
|          |            | Laloid                | C-Qingyun Lalo (Yang 2015); Lalo (Sun, et al. 1991)  |
|          |            | Loloid                | Limi (Yang 2017); Lolopo (Lama 2012); Lipo (Lama 2012)   |
|          |            | Taloid                | Talu, Lavu (Chen 2010); Kuansi (Castro, Flaming & Crook 2010); Naruo (Foley 2020); Tagu (Yang, et al. 2017); |
|          |            | Sanoid                | Sani (Huang & Dai 1992); Azha (Pelkey 2011b); Azhe (Chen 2010); Axi (TBPL 1991)                              |
|          |            | Unclassified          | Khatso (Huang & Dai 1992); Zaozou (Sun, et al. 2002); Jinuo (Sun, et al. 1991); Lawu (Yang 2012)             |
| Northern | Nisoid     | Nuosu (Lama 2012)     |  |
| Southern | Hanoid     | Hani (Li & Wang 1986) |  |

## 4. Results



(2) Reflexes of PN tones by PN onset/prefix across languages in the sample

### Patterns evident from the data:

- Original PN tone values most prevalent across reflexes of all five tones
- Not all of the languages share the proposed tone changes for CN
- No consistent tone changes shared among all of the proposed CN languages

| (3) | PN | PCN          | Lisoid   | Loloid | Laloid | Taloid | Lahoid   | Sanoid   |
|-----|----|--------------|----------|--------|--------|--------|----------|----------|
|     | *1 | high, modal  | 33/44    | 33     | 55     | 55     | 33/21    | 33~44/21 |
|     | *2 | low, breathy | 55/21    | 55/21  | 55/21  | 21~31  | 53/31~21 | 33~55/21 |
|     | *3 | mid, creaky  | 33~44    | 33     | 33     | 33     | 33       | 33       |
|     | *H | mid, tense   | 33~44/35 | 33     | 33     | 33~44  | 54~33/35 | 33~44    |
|     | *L | low, tense   | 55/21    | 55/21  | 21     | 21~31  | 21~31/35 | 55/21    |

(3) PN tone correspondences in six proposed clusters of CN. / = split; ~ = within-cluster variation

| (4) | PN | Khatso   | Zaozou | Jinuo | Lawu  |
|-----|----|----------|--------|-------|-------|
|     | *1 | 33/35    | 33/55  | 44/42 | 33/55 |
|     | *2 | 55/31    | 55/33  | 44/33 | 33/21 |
|     | *3 | 33       | 33     | 44    | 33    |
|     | *H | 53/55/35 | 53     | 42    | 55/33 |
|     | *L | 53/55/35 | 53/13  | 55    | 31/33 |

(4) PN tone correspondences for unclassified languages. / = split

## 5. Discussion

- Proposed shared tonal innovations for CN are **not** shared among all of the proposed members of the sub-branch
- Implication: either (a)** the languages that lack said tone changes are in fact not members of CN **or (b)** the proposed tone changes can only be traced to lower-level clusters and would not have occurred with PCN
- Conclusion:** evidence supports **(b)** and PCN would have retained PN tone values **(3)**
- Many of the proposed CN members share the agentive nominalizer-prefixed lexical innovations for 'dog' and 'fire', e.g. Lisu *a<sup>55</sup>to<sup>21</sup>* 'fire', among other lexical innovations
- Lexical innovations** suggest an earlier relationship between these languages and the tone changes would have occurred after CN split up
- Results act as evidence **against** using tone changes to group languages into CN, as PCN tones likely would have conserved the relative tone values of PN
- Consistent tone changes within the clusters supports more recent proposals to break up Ngwi into numerous **clusters** consisting of 2 – 3 languages rather than larger sub-branches (Lama 2012)

## 6. Limitations & Future Directions

- Complexity** of the tone changes in Ngwi languages is difficult to account for using the current method
- Vowel-conditioned** tone changes, e.g. Laloid split in \*2 conditioned by /a/, and contrastive **phonation** difficult to incorporate
- More in-depth phonological analyses needed of Ngwi languages to better understand **source of tone splits**
- More consistent **shared innovations** needed to better affirm CN as a subgroup of Ngwi
- Difficult to account for tonal variation of languages in the sample using a wordlist of ~200 words
- Future studies should use **longer word lists** to better encapsulate this tonal variation

### References

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