Tone in Gadsup Noun Phrases

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What is tone?

‘A language with tone is one in which an indication of pitch enters into the lexical realization of at least some morphemes.’ (Yip 2002:4)

How common is tone?

60-70% of the world’s languages (Yip 2002)

Extremely common in PNG (Donohue 2003)
Introduction

- Tone is often analysed using Autosegmental Theory (Goldsmith 1976)
  - Tones float “above” segments on a separate tier
  - Tones associate to “tone bearing units” (TBU) in a 1-to-1 fashion
  - TBU is either the syllable or the mora
  - Directionality is a parameter (L-to-R or R-to-L), though this is debated (Zoll 2003)
Introduction

Contour tones:

- Contours are often analysable as combinations of level tones (Duanmu 1994)
- A level tone is one for which a level pitch is an acceptable variant (Maddieson 1978)
- Contours are more common in heavy syllables and at prosodic boundaries (Zhang 2001)

‘One doesn’t hear tones, one hears pitches!’ (Donohue; Hyman 2010)
Tone in PNG

- Surveys of tone in PNG: Donohue 1997, Cahill 2011

- **Syllable tone**
  - Rare in PNG, with only a few indisputable cases
  - Every syllable can be assigned a tone (e.g. H, L)
  - The logical possibility of tonal complexity rises with the increase in syllable count
  - Chuave (Donohue 1997), Iau (Edmondson 1992), Weri (Boxwell & Boxwell 1966), **Gadsup** (Frantz & Frantz 1973, Cahill 2011)
“Pitch-Accent” (i.e. Restricted tone system)

- Found in somewhat random parts of the country, generally bordering an area with word tone (Donohue 2005)
- These systems are analysed in disparate fashions according to theoretical underpinnings
- A restricted set of tonemes (e.g. privative H vs. ø) which are associated to words by lexical accent or general stress placement rules
- Kamoro (Donohue 1997), Marind (Donohue 1997)
Tone in PNG

Word tone

- Most common in PNG, especially across Trans-New Guinea
- Each word is assigned one from a set of underlying tonal melodies (e.g. L, H, LH, HL, LHL)
- The melody then spreads out or contracts to encompass all the syllables, including any affixes
- Some languages have words with lexical accents as well

Barupu (Corris 2005), Fore (Scott 1990), Kairi (Newman & Petterson 1989), Mian (Fedden 2012), Siane (James 1994), Skou (Donohue 2003)
Gadsup

Language family
- TNG, Kainantu-Goroka

Location
- EHP, Kainantu district

Population: 22000 +

Scope
- Analysis based on recordings of only one man, Timmy Kea (from Anamunampa village)
- Aseranka dialect

Previous analysis
- Frantz & Frantz 1973, Cahill 2011
- 4 tonemes: H, L, F, R
- Three long vowels /a/, /e/, /o/
- Three short vowels /a/, /i/, /u/
- 91% of contours occur on the ultima
Phonetics
Phonetics

- Vowel length
- Pitch delay
- Declination
- Tone contrast
- Pitch heights
- Falling low pitch
- Context
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- **Declination**
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![Graphs showing pitch and tone patterns with examples of words like "memanuc 'snakes'" and "mayau amankaci bekoko 'We're okay c are'" demonstrating phonetic features.]

*Note: The graph illustrates pitch levels and tone contrast with specific examples to demonstrate phonetic features such as glottal stop.*
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- Tone contrast

**Pitch heights**

- Falling low pitch
- Context

<table>
<thead>
<tr>
<th>Word</th>
<th>Gloss</th>
<th>Frequency</th>
<th>Chao</th>
</tr>
</thead>
<tbody>
<tr>
<td>uc</td>
<td>‘jungle’</td>
<td>180–200</td>
<td>5</td>
</tr>
<tr>
<td>orem</td>
<td>‘tree kangaroo sp.’</td>
<td>170</td>
<td>44</td>
</tr>
<tr>
<td>fom</td>
<td>‘pig’</td>
<td>150</td>
<td>3</td>
</tr>
<tr>
<td>faanem</td>
<td>‘flying fox’</td>
<td>140–130</td>
<td>21</td>
</tr>
</tbody>
</table>
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Phonetics

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- Contour tones
- Pitch heights
- Falling low pitch
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Nouns (monomorphemic)

- Plateaus occur at the left edge; contours at the right edge
  - sàfùràá ‘tree kangaroo sp.’
  - kánínòm ‘banana sp.’
  - ìsàyàác ‘snake sp.’

- The melody spreads right-to-left

- Long vowels attract contour tones; no concave or convex contours allowed
  - ìyàácé ‘long’
  - òòbá ‘yam’
  - ýùnááám ‘food’

- The TBU is the (vocalic) mora; nasals are non-moraic
Nouns (onomorphemic)

- The non-high vowels (a, e, o) may be long or short; the high vowels (i, u) are always short, never taking contour tones
- Codas do not effect tone; stops only prevent phonetic falls
- The available patterns match expectations:
  - 1µ: îm (L), úc (H)
  - 2µ: yààn (L), órém (H), bàî (LH), máà (HL)
  - 3µ: fàànèm (L), náândúm (H), îyàá (LH), fíndóòm (HL), yùnáàm (LHL)
  - 4µ: yààyùfàm (L), ánáánò (H), ànààyó (LH), kánínóòm (HL), âàfáyù (LHL)
Nouns (polymorphemic)

- The plural suffix and the phrasal marker surface as either H or L, almost always opposite of the final tone of the noun’s melody; *tonal dissimilation*
  - órénùc: ‘tree kangaroos’
  - faànènùc: ‘flying foxes’
  - nòmí: ‘water’
  - máácì: ‘house’

- Case suffixes surface as either H or L, though seemingly unrelated to the final tone of the noun’s melody
  - ànùfàc: ‘to the mountain’
  - úcpác: ‘to the jungle’
  - sàfùràànàmmáç: ‘with the cuscus’
  - àctàyànàmmáç: ‘with grass’
When the phrasal marker follows a case suffix, it is always H

- ànù̀fàcì ‘to the mountain’
- káá̀rì kí̀mí ‘in the car’
- màkù̀fàcì ‘to the village’
- hámàà̀fò̀nì ‘with the hammer’

When a case suffix follows the plural suffix, the case suffix is always L

- nù̀ncnà̀nì̀màcì ‘with the birds’
- màákù̀ncnà̀nì̀màcì ‘with the houses’

Possessive prefixes surface as either H or L depending on the noun’s tonal melody

- ̀ábàm ‘his mouth’
- sèn = tìbàm ‘my mouth’
- ̀ànàà̀fú ‘his grandparent’
- sèn = tìnàà̀fú ‘my grandparent’
What do we know so far?

- Floating tones dock onto monomorphemic nouns only if their final vowel is phonemically long, and no other tone has filled the mora:

  - `safuraa`
  - `abaan`
  - `maaan`

- Case suffixes have underlying L tone, but this is replaced by a noun’s floating tone:

  - `nunnucnammac`
  - `safuraaanammac`
  - `maaanammac`

- Tonal melody spreads onto possessive prefix:

  - `abam`
  - `sen=tinaafu`
Nouns (polymorphemic)

What do we know so far?

- The plural *uc* suffix and the phrasal *i* marker are underlyingly H, but this is replaced by a noun’s floating tone

```
L H    L H    L H L H    H L H H H

anufaci  actayauc  abaauc  maai
```

- Also, Meussen’s Rule (HH → HL) is in effect:

```
H    H H→L

ucpac  ukuc
```
Nouns (polymorphemic)

- Gadsup has 7 *bona fide* tonal melodies based on this analysis
  - L, H, LH, HL, LHL, HLH, LHLH

- The “last but one” tone of complex melodies usually associates to the final syllable, and then the melody spreads outward to encompass the root, prefixes, and suffixes
  - Precedent: Kairi (Newman & Petterson 1990), Mian (Fedden 2012)
  - Occasionally the entire melody surfaces on the noun, leaving no floating tones; this means such words have underlying accents which override default association rules
‘[T]here seems to be a direct correspondence between the major stress of English (or French) and a high tone in the borrowing language’ (Kenstowicz 2006:136; regarding the African context)

- Bisyllabic words with initial stress correlate with HLH melodies
  - [káápi] ‘cup’
  - [káárìnámmáč] ‘with the car’
  - [hámààfóní] ‘with a hammer’

- Others have L or LH melodies
  - [kòmpyùtàá] → [kòmpyùtààkí mí] ‘inside the computer’
  - [trààktàá] ~ [trààká] ‘tractor’
  - [mòbàìl] ‘mobile phone’
Floating tone analysis is supported by tonal perturbation in noun phrases

Many adjectives have a floating tone which replaces a following noun’s tonal melody

\[
\text{\textit{sicto}} + \text{\textit{fakoo}} \rightarrow \text{\textit{sicto fakoo}} \quad \text{‘small spear’}
\]

\[
\text{\textit{baakac}} + \text{\textit{orem}} \rightarrow \text{\textit{baakac orem}} \quad \text{‘short treee kangaroo’}
\]
What does this mean?

- Tonal melodies are a property of morphemes, but a NP may only have one melody
- The melody of the first word spreads throughout the NP
- Conjoined NPs, however, allow multiple melodies
Further support for sparsely attested melodies:

- *sicto* HLH, *amucna* LHLH

However, the melody does not spread onto intensifiers:

- *amucna* ukam + *baakac* ukam

\textit{amucna} + *num* → \textit{amucna num} \textit{‘many birds’}
Every word has one of 7 tonal melodies
- L, H, LH, HL, LHL, HLH, LHLH
- However, these melodies are often only discoverable in polymorphemic forms or across word boundaries in the noun phrase
- The final vowel of each noun is ‘the locus of the pitch change’ (Newman & Petterson 1990)
- The default is for the “last but one” tone to associate to a noun’s final syllable
- This produces what one might call an “offset tone system”
Summary

- The tonal melody spreads leftward to cover the root and any prefixes, and then it spreads rightward onto suffixes.
- Some words have lexical accents which pull the tonal melody inward, removing a floating tone.
- The tonal melody of the first word of each noun phrase spreads throughout the NP.
- Suffixes and clitics have their own tonal melodies. 
  - L, H, LH
Summary

- Three of the five vowels have phonemically long counterparts which can attract contour tones.
- Floating tones displace underlying tones of suffixes.
- Successive H tonemes are disallowed (HH→HL).
- Mid-level pitches occur in three contexts:
  - a L tone raises next to a H.
  - a H tone lowers next to a L.
  - an all-L or all-H word in isolation.
Conclusion

- Orthographical considerations
  - Words should have an ideographic value (Saussure 1916)
  - Tone should not be written in Gadsup NPs, since each word can surface with multiple tonal melodies depending on the context
  - It appears to be more important that vowel length is represented accurately
  - However, tone could be minimally represented by marking minimal pairs and verbal morphemes
Conclusion

- It is important to understand the tone!
  - Discover prosodic boundaries (words, phrases)
  - Distinguish between clitics and affixes
  - Clarify whether vowel length is phonemic
  - Discover minimal pairs
  - Unravel verbal morphemes such as person, tense, aspect & mood
  - Peak into history: compounds, borrowed words, etc.
  - Produce effective orthographies
  - Learn to speak accurately
References


