Trigger-target asymmetries in concatenative vs. replacive tone

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Big picture

• Many phonological operations necessarily refer to morphological and morphosyntactic information

• What are the properties of and in particular restrictions on morpho-phonological operations?

• Stress assignment
  ◦ [Hayes 1995; Alderete 1999, 2001a, 2001b; a.o.]

• Vowel/consonant/nasal harmony
  ◦ [Hansson 2007; Green & Hantgan-Sonko 2018; a.o.]

• Grammatical tone
  ◦ [McPherson 2014; McPherson & Heath 2016; Hyman 2016; Palancar & Leonard 2016; Rolle 2018; a.o.]
Theoretical import

• **Locality** restrictions on triggers and targets (defined structurally or linearly)
  ◦ Globalism vs. localism [Bobaljik 2000, Embick 2010]
  ◦ Long distance effects and conditioning [Hyman 2011]

• **Directionality** restrictions on triggers and targets, e.g. inward towards stem vs. outwards away from stem
  ◦ [Bobaljik 2000, among others]
Focus on grammatical tone

• Focus for this talk: two types of grammatical tone (GT)

• Concatenative ~ Non-dominant
  \[ T + T \rightarrow \tau \]

• Replacive ~ Dominant
  \[ T + T \rightarrow \tau \]
Typological claims (the old and the new)

1) Dominant tone asymmetry

<table>
<thead>
<tr>
<th>Trigger → Target</th>
<th>GT type</th>
<th>Non-dominant (e.g. simple docking)</th>
<th>Dominant (e.g. replacive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical/Dependent → Lexical head</td>
<td>Lexical head</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td>Lexical head → Grammatical/Dependent</td>
<td></td>
<td>✓ Yes</td>
<td>* No</td>
</tr>
</tbody>
</table>

Comparing dominant vs. non-dominant GT

2) Supports *Strict Base Mutation* - A central thesis of Alderete’s (2001a, 2001b) study of stress/accentual systems
   - Affixes can be dominant over roots but roots cannot be dominant over affixes (also supported by Inkelas 1998)
Discussion points

• [1] The **scope** of morpho-phonological operations is determined based on morphological position

• [2] Dominant GT is a **paradigmatic uniformity** effect

• [3] Dominant GT contradicts the oft-cited generalization that **root faithfulness** should win over affix faithfulness
What is grammatical tone (GT) (and what is it not)?
## Tonological processes

<table>
<thead>
<tr>
<th>/ $m_1$</th>
<th>$+$</th>
<th>$m_2$</th>
<th>$\Rightarrow$</th>
<th>$\backslash$ $m_1$ $m_2$ $\backslash$</th>
<th>Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>L</td>
<td>H</td>
<td>$\Rightarrow$</td>
<td>L H $\tau$ $\tau$</td>
<td>[L H]</td>
</tr>
<tr>
<td>b.</td>
<td>L</td>
<td>H</td>
<td>$\Rightarrow$</td>
<td>L H $\tau$ $\tau$</td>
<td>[L [H]]</td>
</tr>
<tr>
<td>c.</td>
<td>H</td>
<td>$\Rightarrow$</td>
<td>[H] $\tau$</td>
<td>Floating tone docking</td>
<td></td>
</tr>
</tbody>
</table>

- Tone addition, deletion, replacement, shifting/displacement, assimilation, dissimilation/polarization, docking, spreading, absorption/simplification, etc.)
Tonological processes

/ máyòmí rà wé /

má yò mí rà wé → [máyòmǐ râ wě]

H L H L H

‘Mayomi bought books’

Grammatical tone definition

**Grammatical tone (GT):** a tonological operation which is (1) not general across the phonological (i.e. tonological) grammar, and (2a) is restricted to the context of a specific morpheme or construction, or (2b) a natural class of morphemes or constructions

- (i.e. *grammatically conditioned* tone addition, deletion, replacement, shifting, assimilation, dissimilation, etc.)

- [See also Hyman 2016]
Grammatical tone in Igbo

• Consider the Igbo (Niger-Congo; Nigeria) dialectal data (Hyman & Schuh 1974:98-99)
  ◦ /LL/ /àgbà/~/ègbà/ ‘jaw’
  ◦ /LL/ /èŋwè/ ‘monkey’

• Here, two nouns in an associative construction appear with a high tone on either N1 or N2

a. Central Igbo: /àgbà + ᵀ + èŋwè / → /àgbà̀èŋwè \ ‘jaw of monkey’

b. Aboh Igbo: /ègbà + ᵀ + èŋwè / → /ègbà̀èŋwè \ ‘jaw of monkey’
Grammatical tone in Igbo

1) This is not phonologically general
   - i.e. / LL # LL / -/-> \ LH LL \ ~ \ LL HL \\

2) This is licensed by the associative construction (and not other constructions)

3) Analysis is floating high tone $\mathbb{H}$

a. Central Igbo: / àgbà + $\mathbb{H}$ + ènjwè / → \ àgbàènjwè \ ‘jaw of monkey’

b. Aboh Igbo: / ègbà + $\mathbb{H}$ + ènjwè / → \ ègbàènjwè \ ‘jaw of monkey’
Grammatical tone in Jumjum (Nilotic: Sudan)

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Absolutive</th>
<th>Modified</th>
<th>Surface</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>/H/</td>
<td>ḍéːŋ</td>
<td>ḍéːŋ</td>
<td>[L]</td>
<td>‘cow’</td>
</tr>
<tr>
<td>/L/</td>
<td>kùːn</td>
<td>kùːn</td>
<td>[L]</td>
<td>‘thorn.sg’</td>
</tr>
<tr>
<td>/HL/</td>
<td>cícàm</td>
<td>cícàm</td>
<td>[LL]</td>
<td>‘knife’</td>
</tr>
<tr>
<td>/LH/</td>
<td>cèw-ná</td>
<td>cèw-ná</td>
<td>[LL]</td>
<td>‘arrow-sg’</td>
</tr>
<tr>
<td>/bòrùŋ-gû/</td>
<td>?ʊŋ /</td>
<td></td>
<td>[bòrùŋ-gû ?ʊŋ ]</td>
<td>‘the man’s clothes’</td>
</tr>
<tr>
<td>cloth-PL</td>
<td>man.SG</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

• Not easily amenable to a ‘floating tone’ analysis (at least on the surface)
The empirical foundation towards a typology of GT

- Recent years have seen a surge of individual in-depth descriptive works on GT, e.g.:
  - Dogon family
  - Gur family
    - [Hyman & Olawsky 2004, Roberts 2016]
  - Bantu family
    - [Odden & Bickmore 2014, Marlo et al. 2015]
  - Ijoid family

- Chadic family
  - [Schuh 2017, a.o.; numerous Hausa]
- Nilotic family
  - [Andersen 1995, Trommer 2011]
- Oto-Manguean family
- Urarina language of South America
  - [Olawsky 2006]
- Japonic lects
  - [Kubozono 2016, Kubozono & Giriko 2018]
- ...among many others
Map of tonal languages (WALS – Maddieson 2013)
Map of tonal languages (WALS – Maddieson 2013)
Need for a larger typology of GT

• Contributions of (grammatical) tone to linguistic inquiry outside of phonology are less apparent, e.g. across morphological theories of different stripes
  ◦ [Paradigm Function Morphology - Stump 2001; Distributed Morphology - Halle & Marantz 1993; Construction Morphology - Booij 2010a,b]

• GT has long been ignored in morphology textbooks

• GT only marginally discussed in morphology handbooks and overviews
  ◦ [Spencer & Zwicky 1998, Hippisley & Stump 2017]

• Limited discussion even in books dedicated to tone
Need for a larger typology of GT

• tonal morpheme

• tonal affix/affixal tone
  - [Yip 2002:115]

• tonal particle
  - [Yip 2002:114]

• tonal suprafixed
  - [Remijsen 2010: 289-290]

• tonal overlay
  - [McPherson & Heath 2016]

• inflectional tone
  - [Palancar & Léonard 2016]

• replacive tone
  - [Welmers 1973:132-133]

• meaningful tone
  - [Ratliff 2010]

• morphological tone
  - [Palancar 2016; Zimmermann 2016]

• morphosyntactic tone
  - [Palancar 2016:113]

• melodic tone
  - [Odden & Bickmore 2014]

• floating tone
  - [Voorhoeve 1971; Hyman & Tadadjeu 1976]

• phrasal grammatical tone
  - [McPherson & Heath 2016]

• grammatical use of tone
  - [Ladefoged & Johnson 2011]

• morphological use of tone
  - [Gussenhoven 2004:46]

• syntactic use of tone
  - [Gussenhoven 2004:46]

• tonosyntax
  - [Heath & McPherson 2013]

• construction tonology
  - [Harry & Hyman 2014]

• melody replacement
  - [Rodewald 1989]

• construction-specific tonology
  - [Yip 2002:107]

• compacité tonale
  - [Green 2018]

• tone perturbation
  - [Pike 1948:25; Mak 1950]

• tone change (Chinese: bianyin; cf. biandiao ‘tone sandhi’)
  - [Chen 2000:30-31]

• semantic-tonal process
  - [Kam 1980]
Need for a larger typology of GT

• No comprehensive typology of GT has been worked out which delimits the exact axes along which GT varies, nor one that typologically/formally distinguishes it from tonal allomorphy, tone sandhi, intonation/demarcative boundary tones, to name major ‘landmarks’ in the tonal literature.

• Towards this end let’s delimit the scope of phenomena we’ll look at today which I classify as GT.
What grammatical tone is *not*

• Not merely the presence of contrastive tone on grammatical elements

• Tone /H/
  
  \( \text{dá}=\text{tsot’e} \)  
  \( \text{1.cpl}=\text{arrive.there} \)
  
  ‘I arrived there.’

• Tone /L/
  
  \( \text{da}=\text{zot’e} \)  
  \( \text{3.irr}=\text{ss/arrive.there} \)
  
  ‘S/he’ll arrive there.’

• [San Ildefonso Tultepec Northern Otomi – Palancar 2016:113]
GT is *not* tone sandhi

• Mandarin has four tonemes (where 5 = highest pitch):
  ◦ T1 /5/ (/ma55/ ‘mother’)
  ◦ T2 /35/ (/ma35/ ‘hemp’)
  ◦ T3 /214/ (/ma214/ ‘horse’)
  ◦ T4 /51/ (/ma51/ ‘to scold’)

• A famous example of tone sandhi is Beijing Mandarin ‘third tone sandhi’

• The third tone T3 /214/ dissimilates to T2 /35/ when it precedes another T3 /214/
GT is *not* tone sandhi

- This tone change is conditioned by the **underlying tonological value** of the second unit and is *not* triggered by grammatical context (contexts which are diverse, e.g. [ADJ N], [N ADJ], [V OBJ], etc.)

a. / T3 T3 /  
   / t₁2¹⁴ t₁2¹⁴ /  

b. / xiao¹²¹⁴ gou¹²¹⁴ /  
   small dog

   / xiaoî¹²¹⁴ gou¹²¹⁴ /  
   ‘small dog, puppy’

c. / dan¹²¹⁴ xiao¹²¹⁴ /  
   gall small

   / danî³⁵ xiao¹²¹⁴ /  
   ‘coward’

d. / mai¹²¹⁴ ma¹²¹⁴ /  
   buy horse

   / maiî³⁵ ma¹²¹⁴ /  
   ‘to buy a horse’

[Beijing Mandarin - Chen 2000:20-21]
GT is *not* tone sandhi

- Working definition of tone sandhi:
  - For a sequence of tonemes / $T_a T_b$ / in some phonological domain $D$
  - There are a set of tonal alternations
  - Which are not conditioned by a grammatical property of either / $T_a$ /, / $T_b$ / or the construction which / $T_a T_b$ / forms
  - But rather, is triggered by the underlying phonological~tonological value of / $T_a$ / and/or / $T_b$ / or from being in a specific phonological position within the domain $D$ (e.g. non-final or non-initial)
GT is not tonal allomorphy

• Tonal allomorphy: yi-bu-qi-ba rule in Standard Mandarin Chinese

• Simplifying for our purposes, this rule applies only to four morphemes
  ° yī /T1~55~H/ ‘one’
  ° bū̀ /T4~51~HL/ ‘not’
  ° qī /T1~55~H/ ‘seven’
  ° bā /T1~55~H/ ‘eight’

• This rule obligatorily changes these morphemes into surface shape [35] when followed by a surface [53] TBU

• Under tonal allomorphy, other morphemes which appear in this environment do not show the tonal alternation (i.e. it is not productive); i.e. this alternation is lexically stored
GT is *not* tonal allomorphy

- Chen points to the following minimal pair with *bù* ‘not’ vs. *bù* ‘division, unit’ in, showing that this tonological process does not apply regularly.

<table>
<thead>
<tr>
<th>Tonal allomorphy in Mandarin Chinese with the yi-bu-qi-ba rule</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>bù</em></td>
</tr>
<tr>
<td>[35]</td>
</tr>
<tr>
<td><em>bù</em></td>
</tr>
<tr>
<td>[53]</td>
</tr>
</tbody>
</table>
Typologizing Grammatical Tone
Anatomy of GT

• Rolle (2018) classifies several components:
  ◦ Trigger: the morpheme or construction which licenses the tonological operation
  ◦ Target: the morpheme or morphemes which is the intended undergoer of a tonological operation
  ◦ Tune (or grammatical tune): the unique tone sequence (or set of tone sequences) which covaries with the grammatical tone construction
## Anatomy of GT

<table>
<thead>
<tr>
<th>GT with / mí ♂♀ / ‘this’ (neut.)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/HH/</td>
<td>/námá/ ‘meat’</td>
<td>/mí nàmá\</td>
<td>‘this meat’</td>
</tr>
<tr>
<td>/LL/</td>
<td>/pùlò/ ‘oil’</td>
<td>/mí pùló\</td>
<td>‘this oil’</td>
</tr>
<tr>
<td>/HL/</td>
<td>/bélè/ ‘light’</td>
<td>/mí bèlé\</td>
<td>‘this light’</td>
</tr>
<tr>
<td>/LH/</td>
<td>/gàrí/ ‘garri’</td>
<td>/mí gàrì\</td>
<td>‘this garri’</td>
</tr>
<tr>
<td>/H Britannica ‘hand’</td>
<td>/mí bàrá\</td>
<td>‘this hand’</td>
<td></td>
</tr>
</tbody>
</table>

- **Kalabari** (Ijoid: Nigeria - Harry & Hyman 2014)
- **Trigger**: demonstrative / mí /H/ ‘this’
- **Target**: noun
  - (the undergoing of the tonological process)
- **Tune**: ♂♀
  - (covaries with demonstrative)
GT as exponence

• **Independent prosodic exponence**: exponence of a grammatical category only by prosodic units of contrast (e.g. tonemes, accent, prosodemes, intonemes, etc.), with no segmental units of contrast (e.g. vowels, consonants, etc.).
  - ‘tonal affix’, ‘tonal morpheme’, among other names

• **Auxiliary prosodic exponence**: the exponence of a grammatical category by segmental units of contrast (e.g. vowels, consonants, etc.), and by co-occurring auxiliary prosodic units of contrast (e.g. tonemes, accent, prosodemes, intonemes, etc.), which appear separate from these segmental units of contrast
GT as exponence

• I adopt the following null hypothesis (following extensive work by Hyman)

• **Non-restrictive prosodic exponence**: all grammatical meaning can be expressed by segmental exponence, by prosodic exponence, or their combination

• If this hypothesis is correct, there should be no grammatical meaning which *cannot* be exponed entirely or partially through prosodic units of contrast such as tonemes~GT, and equally there should be no grammatical meaning which can *only* be exponed via prosodic units of contrast
GT as exponence

<table>
<thead>
<tr>
<th></th>
<th>xnu ‘leave behind’</th>
<th>swi ‘choose’</th>
<th>jwi ‘kill’</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAB</td>
<td>nxnu$^{21}$</td>
<td>nswi$^3$</td>
<td>ntyjwi$^3$</td>
</tr>
<tr>
<td>POT</td>
<td>xnu$^{21}$</td>
<td>swi$^3$</td>
<td>kjwi$^3$</td>
</tr>
<tr>
<td>CPL</td>
<td>nxnu$^{31}$</td>
<td>nswi$^{31}$</td>
<td>yjwi$^3$</td>
</tr>
<tr>
<td>PROG</td>
<td>nxnu$^{31}$</td>
<td>nswi$^{31}$</td>
<td>ntjwi$^2$</td>
</tr>
</tbody>
</table>

b.  

<table>
<thead>
<tr>
<th></th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAB</td>
<td>21</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>POT</td>
<td>21</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>CPL</td>
<td>21</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>PROG</td>
<td>21</td>
<td>31</td>
<td>1</td>
</tr>
</tbody>
</table>

Caveat Emptor: Several cases which defy this assumption

GT in Yaitepec Chatino (Palancar 2016:131, citing Rasch 2015)
GT as exponence

<table>
<thead>
<tr>
<th>Spanish DEM</th>
<th></th>
<th>Hypothetical GT language DEM / mana / ‘man’ / τ τ /</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘this’ este hombre ‘this man’</td>
<td></td>
<td>\máná \‘this man’</td>
</tr>
<tr>
<td>‘that’ ese hombre ‘that man’</td>
<td></td>
<td>\máná \‘that man’</td>
</tr>
<tr>
<td>‘that over there’ aquel hombre ‘that man over there’</td>
<td></td>
<td>\máná \‘that man over there’</td>
</tr>
</tbody>
</table>

• Is this attested?
Tone/tune relations

• **Question**: what is the relationship between underlying tone ~ lexical tone of the host and the grammatical tone (i.e. the exponent)?
### Jumjum replacive tone: L-replacement in modified nouns

<table>
<thead>
<tr>
<th>Underlying</th>
<th>Absolutive</th>
<th>Modified</th>
<th>Surface</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>/H/</td>
<td>ñé:n</td>
<td>ñè:n</td>
<td>[L]</td>
<td>‘cow’</td>
</tr>
<tr>
<td>/L/</td>
<td>kù:n</td>
<td>kù:n</td>
<td>[L]</td>
<td>‘thorn.SG’</td>
</tr>
<tr>
<td>/HL/</td>
<td>cícàm</td>
<td>cícàm</td>
<td>[LL]</td>
<td>‘knife’</td>
</tr>
<tr>
<td>/LH/</td>
<td>càw-ná</td>
<td>càw-ná</td>
<td>[LL]</td>
<td>‘arrow-SG’</td>
</tr>
</tbody>
</table>

GT with / mí / ‘this’ (neut.)

<table>
<thead>
<tr>
<th>/HH/</th>
<th>/námá/</th>
<th>/mí námá/</th>
<th>‘this meat’</th>
</tr>
</thead>
<tbody>
<tr>
<td>/LL/</td>
<td>/pùló/</td>
<td>/mí pùló/</td>
<td>‘this oil’</td>
</tr>
<tr>
<td>/HL/</td>
<td>/bélè/</td>
<td>/mí bèlè/</td>
<td>‘this light’</td>
</tr>
<tr>
<td>/LH/</td>
<td>/gàrì/</td>
<td>/mí gàrì/</td>
<td>‘this garri’</td>
</tr>
<tr>
<td>/H'H/</td>
<td>/bá'rá/</td>
<td>/mí bárá/</td>
<td>‘this hand’</td>
</tr>
</tbody>
</table>

**Relations between underlying tone (red) and grammatical tune (blue)**
Types of GT w.r.t. tone/tune relations

• Existent types
  ◦ Additive-dominant GT (= Replacive)
  ◦ Subtractive-dominant GT
  ◦ Recessive GT
  ◦ Substitutive GT
  ◦ Concatenative GT (e.g. neutral, floating)

• Non-existent types:
  ◦ $^\times$Combustive GT
  ◦ $^\times$Parasitic GT
### Types of GT w.r.t. tone/tune relations

<table>
<thead>
<tr>
<th>Target</th>
<th>Tune 1</th>
<th>/ O/</th>
<th>/ T/</th>
<th>/ °/</th>
<th>/ †/</th>
<th>/ O/</th>
<th>/ T/</th>
<th>/ °/</th>
<th>/ †/</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALUED</td>
<td>\T\</td>
<td>\T\</td>
<td>\T\</td>
<td>\T\</td>
<td>\O\</td>
<td>\O\</td>
<td>\T\</td>
<td>\O\</td>
<td>\T\</td>
</tr>
<tr>
<td>UNVALUED</td>
<td>\O\</td>
<td>\T\</td>
<td>\T\</td>
<td>\T\</td>
<td>\O\</td>
<td>\O\</td>
<td>\T\</td>
<td>\O\</td>
<td>\T\</td>
</tr>
</tbody>
</table>

- **GT type**
  - No GT
  - Recessive
  - Substitutive
  - Additive-dom. (~replacive)
  - Subtractive-dom.
  - *Combustive*
  - *Parasitic* (~neutral)
  - Concatenative (~neutral)

- **We can begin by dividing targets into those which have underlying tone (Valued) and those which do not (Unvalued)**
- **Two most common, which we compare to today are Dominant/replacive ("Replacive" - Welmers 1973) vs. Concatenative (~ Neutral – Rolle 2018)**
Dominance effects

- **Dominant**: complete override of the lexical prosodic properties of the stem
- **Dominance effects** frequently invoked in accentual systems (e.g. Numerous languages surveyed in Alderete 2001a, 2001b)
  - Indo-European accent studies (Kiparsky & Halle 1977), applied to languages including (Vedic) Sanskrit, Lithuanian, Russian, a.o.
  - [Kiparsky 1982, 1984; Melvold 1986; Halle & Vergnaud 1987a,b; Steriade 1988; Golston 1990; Blevins 1993; Sandell 2011; Petit 2016; Kushnir 2018; see Yates 2017 for extensive references]
  - Xârâcûù [ane] (Rivierre 1978)
  - Hausa [hau] (Inkelas 1998)
  - Ese Ejja [ese] (Rolle 2016, Rolle & Vuillermet *in press*)
## Dominant/replacive tone vs. Non-dominant(concatenative/neutral tone)

<table>
<thead>
<tr>
<th>Replacive tone with / mí /‘this’ (neut.)</th>
<th>Concatenative tone with / IMPERATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>/HH/ /námá/ ‘meat’ /mí námá\  ‘this meat’</td>
<td>/H/ /só/ ‘go’ /sô\  ‘go!’</td>
</tr>
<tr>
<td>/LL/ /pùlò/ ‘oil’ /mí pùló\  ‘this oil’</td>
<td>/L/ /sò/ ‘cook’ /sõ\  ‘cook!’</td>
</tr>
<tr>
<td>/HL/ /bélè/ ‘light’ /mí bèlé\  ‘this light’</td>
<td>/HH/ /kúrò/ ‘fall’ /kúrô\  ‘fall!’</td>
</tr>
<tr>
<td>/LH/ /gàrí/ ‘garri’ /mí gàrì\  ‘this garri’</td>
<td>/LL/ /lègì/ ‘sit down’ /lègî\  ‘sit down!’</td>
</tr>
<tr>
<td>/H H/ /bá’rá/ ‘hand’ /mí bárá\  ‘this hand’</td>
<td>/LH/ /dùkò/ ‘tell, talk’ /dùkô\  ‘tell (it)!’</td>
</tr>
<tr>
<td>[Kalabari language – Harry &amp; Hyman 2014; personal fieldnotes]</td>
<td>[Kalabari language – Harry &amp; Hyman 2014; personal fieldnotes]</td>
</tr>
</tbody>
</table>
Dominant/replacive tone vs. Concatenative tone

• **Hausa** language (Chadic: Nigeria/Niger)
  ◦ Dominant/replacive tone (first example)
  ◦ Concatenative (second example)

/ jìmìnáá + ₋úú / → jìmìn-úú [jìmìnúú]  ‘ostriches’
/ jààkíí + ₋n / → jààkíí-n [jààkíîn]  ‘the donkey’

[Hausa - Newman 1986:252,257]
GT type is an idiosyncratic property of the trigger

- GT type is an idiosyncratic property of the trigger, and \textit{not} of the target nor the tune
- This means that whether GT is dominant/replacive tone or concatenative/neutral tone is attributable to an \textbf{idiosyncratic lexical} property of the triggering morpheme or construction
- It is \textit{not} due to a phonological properties of the target’s underlying tone or the grammatical tune
  \- i.e. \textit{NOT} Emergence of the Unmarked (\textsuperscript{x}TETU effect)
Independence of GT from the larger phonological grammar

• GT outputs cannot be predicted from the ambient phonological grammar

• Markedness is orthogonal, i.e. output not due to
  ◦ Restrictions of permitted tonemes/melodies/contours
  ◦ Culminativity (restriction on number of tonemes in domain $D$)
  ◦ Prominent vs. non-prominent positions
GT with markedness increase

• Tommo So [dto] (Dogon: Mali)

• Lexical verb tone is almost entirely predictable
  ◦ Verbs beginning with all other segments have H(H) tone
  ◦ Verbs which begin with a voiced obstruent appear with L(H) tone (a type of depressor consonant effect)
  ◦ Lexical exceptions with three segments (/n/, /dʒ/ <j>, and /j/ <y>)

• Cf. Grammatical tone not sensitive to markedness
  
  HHH kilémó ‘play’ → [kìlèmò=be] ‘s/he used to play’
  LHH gòróló ‘snore’ → [gòròlò=be] ‘s/he used to snore’
  HH ébè ‘buy’ → [ébè-dè] ‘(s/he) buys/will buy’
  LH dʒòbò ‘run’ → [dʒòbò-dè] ‘(s/he) runs/will run’

[Tommo So – McPherson 2013:283]
GT with markedness increase

• Across African languages it is common for a marked tonal pattern only surfaces via grammatical tone
  ◦ In Fe’fe’-Bamileke [fmp] the H toneme (unlike M and L) is restricted to grammatical processes and morphemes (e.g. demonstratives, subjunctive marker, the numeral /pɯa/ ‘two’)

• Certain tonal sequences are only seen in grammatical contexts, e.g. in Kukuya [kkw] (Bantu - Paulian 1975) a L tone verb acquires a LHL melody in the present tense (e.g. ndé bàámì ‘he wakes up’)

• Parallel examples are found in Tommo So discussed above, and Esan [ish] (Edoid, Benue-Congo – author fieldnotes) and Tommo So (Dogon, just discussed)
A trigger-target asymmetry with concatenative vs. replacive tone
Questions

• What can be a dominant/replacive trigger? What can be its target?
• And what are its restrictions and how do we explain them?
• What happens when you have more than one (dominant/replacive) trigger? Which one wins?
  ° [As asked by McPherson 2014 and Hyman 2016]
Dominant tone asymmetry

- **Dominant tone asymmetry**: within a multi-morphemic constituent in a GT construction, a dominant/replacive trigger is morphologically outward compared to the target.
  - E.g. the trigger is a dependent and the target is a lexical head (+ inner dependents)
  - E.g. the trigger is an affix and the target is a stem (+ inner affixes)

- No such restriction occurs with **concatenative** tone (or non-dominant GT generally)
Dominant tone asymmetry

<table>
<thead>
<tr>
<th>Trigger → Target</th>
<th>GT type</th>
<th>Non-dominant (e.g. simple docking)</th>
<th>Dominant (e.g. replacive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammatical/Dependent → Lexical head</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td>Lexical head → Grammatical/Dependent</td>
<td>✓ Yes</td>
<td></td>
<td>* No</td>
</tr>
</tbody>
</table>

Comparing dominant vs. non-dominant GT
Inward direction: No asymmetry

Affix $\rightarrow$ Stem

- **Hausa** language (Chadic: Nigeria/Niger)
  - Dominant/replacive affix (first example)
  - Non-dominant/Concatenative affix (second example)
Inward direction: No asymmetry

Affix ➔ Stem

Outer neutral trigger
makañanciyâr ‘the reader (female)’ (well-read person, usually w.r.t. the Koran)

Cycles

Dom / kàràntâ: -ɨ́ií / → \kàràncíí\
Non-dom / má- kàrànci / → \mákàràncí\
Dom / mákàràncií -îyáá / → \mákàrànciîyáá\
Non-dom / mákàrànciîyáá - r / → \mákàrànciîyâr\

[ [ [ má-
NML- read -AGENT -FEM -REF
NEUT ROOT DOM DOM NEUT

[Hausa – Inkelas 1998:132]
Inward direction: No asymmetry

**Dependent ➔ Lexical head**

“Briefly, the head is the word which governs, or is subcategorized for—or otherwise determines the possibility of occurrence of—the other word. It determines the category of its phrase.”

[Nichols 1986:57]

<table>
<thead>
<tr>
<th></th>
<th>Head</th>
<th>Dependent</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Phrase</td>
<td>possessed noun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>noun</td>
</tr>
<tr>
<td></td>
<td></td>
<td>adposition</td>
</tr>
<tr>
<td>b.</td>
<td>Clause</td>
<td>predicate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>auxiliary verb</td>
</tr>
<tr>
<td>c.</td>
<td>Sentence</td>
<td>main-clause predicate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>possessor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>modifying adjective</td>
</tr>
<tr>
<td></td>
<td></td>
<td>object of an adposition</td>
</tr>
<tr>
<td></td>
<td></td>
<td>arguments and adjuncts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>lexical (‘main’) verb</td>
</tr>
<tr>
<td></td>
<td></td>
<td>relative or subordinate clause</td>
</tr>
</tbody>
</table>

**Head-dependent distinction at least as far back as Bloomfield (1914)**

- Exploited in Dependency Grammar [Jurafsky & Martin 2017]
- Head-Driven Phrase Structure Grammar [Pollard & Sag 1994]
- Much computational linguistics
Inward direction: No asymmetry

Dependent ➔ Lexical head

• Eastern Bantu language Makonde
  ° [dialect of Chinnima - Kraal 2005]
<table>
<thead>
<tr>
<th>Tone Class</th>
<th>≈ / Underlying [ Citation ]</th>
<th>Non-dominant Possessive pronoun / + ṭṭṭ /</th>
<th>Dominant/Replacive / + o-PPx-nó / DEM ‘this X’ / + ú্ত্ত্঵ানি / ‘what kind of X?’</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>/ litáwa / [ litááwa ] ‘clan’</td>
<td>li[tááva lýeɛtu ‘our clan’</td>
<td>li[tááva álí]no lita[wá ú্ত্ত্঵ানি</td>
</tr>
<tr>
<td>C1</td>
<td>/ lutaví / [ lútáávi ] ‘branch’</td>
<td>lutaví lwaakke ‘his branch’</td>
<td>lutaví álúú]no luta[ví ú्त्त्वानि</td>
</tr>
<tr>
<td>D1</td>
<td>/ chiyewe / [ chiyèèwè ] ‘chin’</td>
<td>chiyèévé chaǎngu ‘my chin’</td>
<td>chiyévé áchí]no chiye[vé ú्त्त्वानि</td>
</tr>
<tr>
<td>E</td>
<td>/ limbeénde / [ limbééndè ] ‘skin’</td>
<td>limben[Dé lýaǎngu ‘my skin’</td>
<td>limbendé álí]no limbe[ndé ú्त्त्वानि</td>
</tr>
</tbody>
</table>

Makonde language
Inward direction: No asymmetry

Dependent ➔ Lexical head

• Dependent-triggered dominant/replacive GT
  ◦ Ijoid family (robust)
    ◦ [Harry 2004; Harry & Hyman 2014; Rolle 2018; a.o.]
  ◦ Dogon family (robust)
    ◦ [McPherson 2014; a.o.]
  ◦ Japonic family
    ◦ [Kubozono 2016, Kubozono & Giriko 2018]
# Outward direction: Dominant Tone Asymmetry – Root/Stem ➔ Affix

| Underlying tone | /-Ø/ | /-H\(^\circ\)/ | Examples | CL3.SG /-U/ | CL12.SG /-ka/ | CL4.PL /-i\(^\circ\)/ | CL13.PL /-si\(^\circ\)/ |
|-----------------|------|---------------|----------|-------------|---------------|----------------|----------------|----------|
| (76)            |      |               |          |             |               |                |                |          |
| a. /H/-         | HH-H | H\(^\circ\)-L | náná- ‘bowl’ | jáná-á      | jánú-zi       |                |                |          |
|                 | /H\(^\circ\)-/ | HH-Ł | H\(^\circ\)-L | wáá- ‘five year period’ | wáá-à      | wáá-sí       |                |          |
| b. /L/-         | LL-L | L\(^\circ\)-L | màzà- ‘Saturday’ | màzà-à      | màzá-sí       |                |                |          |
|                 | /L\(^\circ\)-/ | LL-Ł | L\(^\circ\)-L | hùlà- ‘hat’ | hùlà-á      | hùlá-sí       |                |          |
| c. /HL-/        | HL-L | H\(^\circ\)-L | kpítà- ‘week’ | kpítà-ô      | kpítà-ɨ      |                |                |          |
|                 | /HL\(^\circ\)-/ | HL-Ł | H\(^\circ\)-L | sákà- ‘porch’ | sákà-á      | sákà-sí       |                |          |
|                 |      |               | kpíyò- ‘canoe’ | kpíyò-ô      | kpíyì-ɨ      |                |                |          |
|                 |      |               | kádjá- ‘enclosure’ | [kpr\(^\circ\)yòô] | kádjá-sí |                |                |          |
|                 |      |               | [ká\(^\circ\)dá] |                |                |                |                |          |
| d. /LH-/        | LH-H | L\(^\circ\)-L | hèŋ- ‘crack’ | hèŋ-á      | hèn-zi       |                |                |          |
|                 | /LH\(^\circ\)-/ | LH-Ł | L\(^\circ\)-L | kòò- ‘sacred place’ | kòò-kà      | kòó-sí       |                |          |

[Kabiye – Roberts 2016]
Outward direction: Dominant Tone Asymmetry – **Root/Stem → Affix**

<table>
<thead>
<tr>
<th></th>
<th>Root/STEM</th>
<th>Affix</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>H</td>
<td>/sóbó- + qè/</td>
<td>\sóbó-qè \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/sóbó- + lá/</td>
<td>\sóbó-lá \</td>
</tr>
<tr>
<td></td>
<td>H⁰</td>
<td>/púló- + ne/</td>
<td>\púló-ne \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/púló- + ná/</td>
<td>\púló-ná \</td>
</tr>
<tr>
<td>b.</td>
<td>LH</td>
<td>/ìgí- + ne/</td>
<td>\ìgí-ne \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/ìgí- + ná/</td>
<td>\ìgí-ná \</td>
</tr>
<tr>
<td></td>
<td>LH⁰</td>
<td>/kpátá- + qè/</td>
<td>\kpátá-qè \</td>
</tr>
<tr>
<td></td>
<td></td>
<td>/kpátá- + lá/</td>
<td>\kpátá-lá \</td>
</tr>
</tbody>
</table>
Supports ‘strict base mutation’

Strict Base Mutation (Alderete 2001b): alternations triggered by morphophonological operations are found exclusively in the stem (simplex or complex) which serves as the base of a morphological process.

• A central thesis of Alderete’s (2001a, 2001b) study of stress/accentual systems: affixes can be dominant over roots but *roots cannot be dominant over affixes*

• Similar conclusions are made in Inkelas (1998) for tone, though without a larger typology.
What would outward dominance look like here?

<table>
<thead>
<tr>
<th>Root tone</th>
<th>Suffix tone</th>
<th>/-Ø/</th>
<th>/-HL/</th>
<th>/-H'L/</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. i. /H-/</td>
<td>HH-H</td>
<td>HH-HL</td>
<td>H-H-L</td>
<td></td>
</tr>
<tr>
<td>ii. /H\textsuperscript{I}-/</td>
<td>HH-\textsc{I}</td>
<td>HH-\textsc{I}</td>
<td>HH-\textsc{I}</td>
<td></td>
</tr>
<tr>
<td>b. i. /L-/</td>
<td>LL-L</td>
<td>LL-HL</td>
<td>L-H-L</td>
<td></td>
</tr>
<tr>
<td>ii. /L\textsuperscript{I}-/</td>
<td>LL-\textsc{I}</td>
<td>LL-\textsc{I}</td>
<td>LL-\textsc{I}</td>
<td></td>
</tr>
<tr>
<td>c. i. /HL-/</td>
<td>HL-L</td>
<td>HL-HL</td>
<td>H-H-L</td>
<td></td>
</tr>
<tr>
<td>ii. /HL\textsuperscript{I}-/</td>
<td>HL-\textsc{I}</td>
<td>HL-\textsc{I}</td>
<td>HL-\textsc{I}</td>
<td></td>
</tr>
<tr>
<td>d. i. /LH-/</td>
<td>LH-H</td>
<td>LH-HL</td>
<td>L-H-L</td>
<td></td>
</tr>
<tr>
<td>ii. /LH\textsuperscript{I}-/</td>
<td>LH-\textsc{I}</td>
<td>LH-\textsc{I}</td>
<td>LH-\textsc{I}</td>
<td></td>
</tr>
</tbody>
</table>

• **Fake Kabiye**
  (not an attested system)
<table>
<thead>
<tr>
<th>Language</th>
<th>Family (Location)</th>
<th>Sponsoring Root</th>
<th>Floating tone</th>
<th>Type (Behavior)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Urarina</td>
<td>Isolate (Peru)</td>
<td>N</td>
<td>0</td>
<td>Neutral (dock to toneless V/Adj/PostP)</td>
<td>[Olawsky 2006:122,136]</td>
</tr>
<tr>
<td>b. Magdalena</td>
<td>Mixtec (Mexico)</td>
<td>N</td>
<td>0-0</td>
<td>Local replicative only (overrides single local TBU only)</td>
<td>[Hollenbach 2003, 2005]</td>
</tr>
<tr>
<td>c. Amuzgo</td>
<td>Otomanguean (Mexico)</td>
<td>N</td>
<td>0</td>
<td>Neutral (makes a syllable ballistic)</td>
<td>[Williams 2004]</td>
</tr>
<tr>
<td>d. Arapaho</td>
<td>Algonquian (USA)</td>
<td>N/V</td>
<td>0</td>
<td>Neutral (falls on previous morpheme, numerous patterns)</td>
<td>[Cowell &amp; Moss 2008]</td>
</tr>
<tr>
<td>e. Kunama</td>
<td>Isolate? (Eritrea)</td>
<td>N</td>
<td>0-0</td>
<td>Neutral/Local replicative only (docks to following suffix, creates contours, or replaces a single local TBU only)</td>
<td>[Connell et al. 2000]</td>
</tr>
<tr>
<td>f. Ganza</td>
<td>Mao (Ethiopia)</td>
<td>N/V</td>
<td>0-0</td>
<td>Neutral (dock to toned suffix, create contour)</td>
<td>[Smolders 2016]</td>
</tr>
<tr>
<td>g. Vute</td>
<td>Mambiloid (Nigeria)</td>
<td>N</td>
<td>0</td>
<td>Neutral (downstep)</td>
<td>[Thwing &amp; Watters 1987:24]</td>
</tr>
<tr>
<td>h. Ga’anda</td>
<td>Chadic (Nigeria)</td>
<td>N</td>
<td>0</td>
<td>Neutral (downstep)</td>
<td>[Newman 1971]</td>
</tr>
<tr>
<td>i. Mbui</td>
<td>Bantoid (Cameroon)</td>
<td>N/V</td>
<td>0</td>
<td>Neutral (downstep)</td>
<td>[Hyman &amp; Tadadjeu 1976]</td>
</tr>
<tr>
<td>j. Mituku</td>
<td>Bantu (DRC)</td>
<td>all /H/ V</td>
<td>0</td>
<td>Neutral (dock to previous prefix, create falling or downstep)</td>
<td>[Goldsmith 2002]</td>
</tr>
<tr>
<td>k. Dembwa</td>
<td>Bantu (Kenya)</td>
<td>N</td>
<td>0</td>
<td>Neutral (dock to following toneless Adj)</td>
<td>[Odden 2001, 2006]</td>
</tr>
<tr>
<td>l. Kabiye</td>
<td>Gur (Togo)</td>
<td>N</td>
<td>0-0</td>
<td>Neutral (dock to toneless suffix)</td>
<td>[Roberts 2016]</td>
</tr>
</tbody>
</table>

Table 14: Sample of languages with root-sponsored floating tone (all are non-dominant)
Outward direction: Dominant Tone Asymmetry – **Lexical Head ➔ Dependent**

- **Izon (Ijoid: Nigeria)** [personal fieldnotes on Gbarain Dialect]

<table>
<thead>
<tr>
<th>Tone class</th>
<th>Noun example</th>
<th>kpo ‘also’</th>
<th>kumọ ‘only’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A the LH class</td>
<td>[bùrù]</td>
<td>bùrù&lt;sub&gt;A&lt;/sub&gt; kpo</td>
<td>bùrù&lt;sub&gt;A&lt;/sub&gt; kumọ</td>
</tr>
<tr>
<td>B the H class</td>
<td>[námá]</td>
<td>námá&lt;sub&gt;B&lt;/sub&gt; kpo</td>
<td>námá&lt;sub&gt;B&lt;/sub&gt; kumọ</td>
</tr>
<tr>
<td>C the default L class</td>
<td>[òpòríòpò]</td>
<td>òpòríòpò&lt;sub&gt;C&lt;/sub&gt; kpo</td>
<td>òpòríòpò&lt;sub&gt;C&lt;/sub&gt; kumọ</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1- / Ø /</th>
<th>2- / L&lt;sub&gt;W&lt;/sub&gt; /</th>
<th>3- / L&lt;sub&gt;S&lt;/sub&gt; /</th>
<th>4- / H L /</th>
</tr>
</thead>
<tbody>
<tr>
<td>kpo ‘also’</td>
<td>bì DEF</td>
<td>bèì ‘some particular’</td>
<td>mọ sẹ ‘all the’</td>
</tr>
<tr>
<td>kì ‘particular, instead’</td>
<td>mọ DEF.PL</td>
<td>sẹ ‘all’</td>
<td></td>
</tr>
<tr>
<td>ọmọ ‘INDEF.PL’</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kumọ ‘only’</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Post-nominal modifiers split by tonal behavior
**Outward direction: Dominant Tone Asymmetry** – **Lexical Head ➔ Dependent**

- **Izon (Ijoid: Nigeria)** [personal fieldnotes on Gbarain Dialect]

### Nouns with post-nominal modifier 2 / $L_w$/

<table>
<thead>
<tr>
<th></th>
<th>‘the LH’</th>
<th>‘the yam’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>\bùrù_A</td>
<td>bì \</td>
</tr>
<tr>
<td>B</td>
<td>‘the H’</td>
<td>‘the meat’</td>
</tr>
<tr>
<td>C</td>
<td>‘the default L’</td>
<td>‘the pig’</td>
</tr>
</tbody>
</table>

### Nouns with post-nominal modifier 3 / $L_s$/

<table>
<thead>
<tr>
<th></th>
<th>‘some particular yam’</th>
<th>‘some particular meat’</th>
<th>‘some particular pig’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>\bùrù_A</td>
<td>bèi \</td>
<td>bèi \</td>
</tr>
<tr>
<td>B</td>
<td>‘the H’</td>
<td>‘some particular meat’</td>
<td>‘some particular pig’</td>
</tr>
<tr>
<td>C</td>
<td>‘the default L’</td>
<td>‘some particular pig’</td>
<td>‘some particular pig’</td>
</tr>
</tbody>
</table>

### Nouns with post-nominal modifier 4 / $H,L$/

<table>
<thead>
<tr>
<th></th>
<th>‘all the yams’</th>
<th>‘all the meat’</th>
<th>‘all the pigs’</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>\bùrù_A</td>
<td>mọ sẹ \</td>
<td>mọ sẹ \</td>
</tr>
<tr>
<td>B</td>
<td>‘the H’</td>
<td>‘all the meat’</td>
<td>‘all the pigs’</td>
</tr>
<tr>
<td>C</td>
<td>‘the default L’</td>
<td>‘all the pigs’</td>
<td>‘all the pigs’</td>
</tr>
</tbody>
</table>
Outward direction: Dominant Tone Asymmetry – **Object ➔ Verb**

- Generalizations of phrase-level GT (Harry & Hyman 2014:680-681)
  - Modifier/specifier targets the head of an NP/VP
  - Object targets the head of a VP
Outward direction: Dominant Tone Asymmetry – **Object→Verb**

Replacive-dominant GT - [OBJ ➤ V]

<table>
<thead>
<tr>
<th>Tone class A</th>
<th>Tone class B</th>
<th>Tone class C</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘the LH’</td>
<td>‘the H’</td>
<td>‘the default L’</td>
</tr>
</tbody>
</table>

- **Tone class A ‘the LH’**
  - /bùrùₐ + fè/ ➔ bùrù fè
  - ‘buy a yam’

- **Tone class B ‘the H’**
  - /námáₐ + fè/ ➔ námá fè
  - ‘buy meat’

- **Tone class C ‘the default L’**
  - /ôrōₜ + fè/ ➔ ôrō fè
  - ‘buy a mat’

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘the LH’</td>
<td>‘the H’</td>
<td>‘the default L’</td>
</tr>
</tbody>
</table>

- **A ‘the LH’**
  - /̀opùₐ/ bùrù gbòrò
  - ‘plant (a) ___ yam’
  - ‘plant a big yam’

- **B ‘the H’**
  - /èndìₜ/ bùrù gbòrò
  - ‘plant that yam’

- **C ‘the default L’**
  - /káláₜ/ bùrù gbòrò
  - ‘plant a small yam’

*Izon - author fieldnotes*
Outward direction: Dominant Tone Asymmetry – **Verb ➞ Object**

<table>
<thead>
<tr>
<th>Verb</th>
<th>Obj</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>/L/ kūs ‘buy’</td>
<td>bikòn</td>
<td>/HL/ m̱ákùs, LL bikòn</td>
<td>/LH/ m̱ákùs</td>
<td>/LHH/ bitétám, LLH bikòn</td>
<td>/LHL/ bisíŋgi, LHL èsíŋgi</td>
<td>/LLH/ òfùmbí, LLH m̱ákùs</td>
</tr>
<tr>
<td>/H/ dží ‘eat’</td>
<td>bikòn</td>
<td>/HL/ m̱ákùs, LL bikòn</td>
<td>/LH/ m̱ákùs</td>
<td>/LHH/ bitétám, LLH bikòn</td>
<td>/LHL/ bisíŋgi, LHL èsíŋgi</td>
<td>/LLH/ òfùmbí, LLH m̱ákùs</td>
</tr>
</tbody>
</table>

**Non-dominant** Verb-Object tone agreement in Bulu (Bantu)

[Clem 2014:10 supported by Yukawa 1992; see Rolle (2018) dissertation for translations]
Outward direction: Dominant Tone Asymmetry – Verb → Object

<table>
<thead>
<tr>
<th>Verb</th>
<th>Object Tone</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>/HL/</td>
</tr>
<tr>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td>O</td>
</tr>
<tr>
<td>/L/</td>
<td>LL</td>
</tr>
<tr>
<td></td>
<td>LL</td>
</tr>
<tr>
<td>/H/</td>
<td>LH</td>
</tr>
<tr>
<td></td>
<td>LH</td>
</tr>
<tr>
<td></td>
<td>LH</td>
</tr>
</tbody>
</table>

Non-attested hypothetical verb dominance over object
Counter-examples to ‘no outward dominance’

• Within survey, small number of surface counter-examples

• It appears that an lexical head is a dominant trigger over an outer dependent, contrary to expectations
Counter-examples to ‘no outward dominance’ – Shanghai Wu

Apparent outward dominance – Verb over object

/sâŋ/ + /foŋ/ → \sâŋ-foŋ\ 
‘hurt’ ‘wind’

to catch a cold

/paq\H ng\H yiq\H pæŋ\H si\HL/ → \paq\H ng\H yiq\O pæŋ\O si\HL\ 
give me one CLASSIFIER book

give me a book


Metrical analysis of apparent outward dominance:

\[
\begin{array}{cccc}
\text{x} & \text{paq} & \text{ng} & \text{yi} \\
\text{paq} & \text{ng} & \text{yi} & \text{pæ} \\
\text{g} & \text{a} & \text{v} & \text{e} \\
\text{me} & \text{one} & \text{CLASSIFIER} & \text{book}
\end{array}
\]

[Shanghai Wu – Chen 2000:313]
### Counter-examples to ‘no outward dominance’ – Shanghai Wu

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Apparent</th>
<th>True</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a.</strong> Trigger:</td>
<td><em>Not</em> specific to a natural class of triggers</td>
<td>Specific to a natural class of triggers</td>
</tr>
<tr>
<td><strong>b.</strong> Position of prominence:</td>
<td>The trigger is in a position of metrical prominence (e.g. stressed) and the target is not</td>
<td>The trigger is <em>not</em> necessarily in a position of prominence</td>
</tr>
<tr>
<td><strong>c.</strong> Domain of tonological operation:</td>
<td>The domain of the operation is a phonological constituent (e.g. prosodic foot, word, phrase, etc.)</td>
<td>The domain of the operation is <em>not</em> necessarily a phonological constituent</td>
</tr>
<tr>
<td><strong>d.</strong> Phonological size of trigger/target:</td>
<td>The phonological size of the trigger or target affects the application of the operation (e.g. syllabicly)</td>
<td>The phonological size of the trigger or target does <em>not</em> affect the application</td>
</tr>
<tr>
<td><strong>e.</strong> Floating tones &amp; self-docking:</td>
<td>Does <em>not</em> lend itself to an analysis with floating tones; self-docking is expected</td>
<td>Lends itself to floating tones; self-docking is <em>not</em> expected</td>
</tr>
</tbody>
</table>

Table 15: Apparent versus true outward dominance
<table>
<thead>
<tr>
<th>Noun</th>
<th>Adjective</th>
<th>1 /M/ (n=2)</th>
<th>2 /L/ (n=1)</th>
<th>3 /H/ (n=5)</th>
<th>4 /H/ (n=5)</th>
<th>5 /HM/ (n=6)</th>
<th>6 /HM/ (n=2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. /H/</td>
<td>yì?é ‘fish’</td>
<td>H # M-M</td>
<td>H # L-H</td>
<td>H # *H-H</td>
<td>H # H-L</td>
<td>H # HM-L</td>
<td>H # HM-L</td>
</tr>
<tr>
<td>/M/</td>
<td>gbää ‘stick’</td>
<td>M # M-M</td>
<td>M # L-H</td>
<td>M # H-H</td>
<td>M # H-L</td>
<td>M # HM-L</td>
<td>M # HM-L</td>
</tr>
<tr>
<td>/L/</td>
<td>nùʔə ‘wrap’</td>
<td>L # M-M</td>
<td>L # L-H</td>
<td>L # H-H</td>
<td>L # H-L</td>
<td>L # HM-L</td>
<td>L # HM-L</td>
</tr>
<tr>
<td>b. /L/</td>
<td>miʔə ‘person’</td>
<td>L # L-H</td>
<td>L # L-H</td>
<td>L # H-H</td>
<td>L # H-L</td>
<td>L # HM-L</td>
<td>L # HM-L</td>
</tr>
<tr>
<td>c. /H/</td>
<td>kpésé ‘chewstick’</td>
<td>H # L-L</td>
<td>H # L-H</td>
<td>H # L-H</td>
<td>H # L-H</td>
<td>H # L-H</td>
<td>H # HM-L</td>
</tr>
<tr>
<td>/HM/</td>
<td>kúru ‘boat’</td>
<td>HH # L-L</td>
<td>HH # L-H</td>
<td>HH # L-H</td>
<td>HH # L-H</td>
<td>HH # L-H</td>
<td>HH # HM-L</td>
</tr>
<tr>
<td>/LH/</td>
<td>tòfá ‘brick’</td>
<td>LH # L-L</td>
<td>LH # L-H</td>
<td>LH # L-H</td>
<td>LH # L-H</td>
<td>LH # L-H</td>
<td>LH # HM-L</td>
</tr>
<tr>
<td>/MH/</td>
<td>mótó ‘motorcycle’</td>
<td>MH # L-L</td>
<td>MH # L-H</td>
<td>MH # L-H</td>
<td>MH # L-H</td>
<td>MH # L-H</td>
<td>MH # HM-L</td>
</tr>
</tbody>
</table>

Table 17: Outward dominance - Floating tones on nouns overriding adjectives in Jalkunan
Summary and discussion
Major generalizations

• If an affix or dependent is toneless (i.e. unvalued), it readily takes outwardly assigned tune e.g. from a root

• However, if it has underlying tone (i.e. valued), these are *not* automatically deleted, i.e. it is not dominant/replacive

• **Take away point:** Root-sponsored floating tone is not replacive

• **Take away term:** We can call this the “no outward dominance” principle
Major generalizations

• Non-dominant is symmetrical:
  ◦ i.e. Concatenative (~ Neutral)

• Dominant is asymmetrical:
  ◦ i.e. Additive-dominant/Replacive
Dominant tone asymmetry

<table>
<thead>
<tr>
<th>Trigger → Target</th>
<th>Tone pattern</th>
<th>Non-dominant (e.g. docking)</th>
<th>Dominant (e.g. replacive)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grammatical/Dependent</strong> → <strong>Lexical head</strong></td>
<td>✓ Yes</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td>a. Affix → Root</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td>b. Modifier → Noun</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td>c. Object → Verb</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
<td>✓ Yes</td>
</tr>
<tr>
<td><strong>Lexical head</strong> → <strong>Grammatical/Dependent</strong></td>
<td>✓ Yes</td>
<td>* No</td>
<td>* No</td>
</tr>
<tr>
<td>d. Root → Affix</td>
<td>✓ Yes</td>
<td>* No</td>
<td>* No</td>
</tr>
<tr>
<td>e. Noun → Modifier</td>
<td>✓ Yes</td>
<td>* No</td>
<td>* No</td>
</tr>
<tr>
<td>f. Verb → Object</td>
<td>✓ Yes</td>
<td>* No</td>
<td>* No</td>
</tr>
</tbody>
</table>
Three discussion points
[1] Morpho-phonological scope

- **Morpho-phonological scope**
  - Need for morpho-phonological operations where *scope* can be determined based on morphological position
  - This cannot be reduced to phonological~tonological properties of the phonological substance involved
Three discussion points

[2] Dominance as paradigm uniformity

• We can see dominant/replacive tone and concatenative tone as responses to distinct tensions
  ◦ Non-dominant/Concatenative: maintains lexical underlying tones of the target *paradigmatically* across various grammatical contexts
  ◦ Dominant/replacive: maintains grammatical tune assigned by trigger *transparadigmatically* across various lexical contexts
Three discussion points

[2] Dominance as paradigm uniformity

Figure 4: Paradigmatic (black checked) vs. Transparadigmatic OO-Corr (red solid)
Three discussion points
[2] Dominance as paradigm uniformity

  - always \ LH \ output, consistent cue for this construction

<table>
<thead>
<tr>
<th>GT with / mí \H\ / ‘this’ (neut.)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>/HH/</td>
<td>/námá/</td>
<td>‘meat’</td>
<td>\mí nàmá\</td>
<td>‘this meat’</td>
<td></td>
</tr>
<tr>
<td>/LL/</td>
<td>/pùlò/</td>
<td>‘oil’</td>
<td>\mí pùló\</td>
<td>‘this oil’</td>
<td></td>
</tr>
<tr>
<td>/HL/</td>
<td>/béle/</td>
<td>‘light’</td>
<td>\mí bèle\</td>
<td>‘this light’</td>
<td></td>
</tr>
<tr>
<td>/LH/</td>
<td>/gàrí/</td>
<td>‘garri’</td>
<td>\mí gàrí\</td>
<td>‘this garri’</td>
<td></td>
</tr>
<tr>
<td>/H⁺H/</td>
<td>/bá⁺rᵃ/</td>
<td>‘hand’</td>
<td>\mí bàrá\</td>
<td>‘this hand’</td>
<td></td>
</tr>
</tbody>
</table>
Three discussion points

[3] Contradicting root faithfulness

• Notable aspect of this asymmetry:
  ◦ Lexical heads do not neutralize tonal contrast on outer affixes/modifiers
  ◦ *The opposite is frequently encountered*
  ◦ I.e. properties of the affix survive but phonological properties of the root do not

• This contradicts the oft-cited preference for root faithfulness over affix faithfulness [McCarthy & Prince 1995; Beckman 1998; Ussishkin & Wedel 2002; Krämer 2006; Urbanczyk 2011; Hall et al. 2016, a.o.]

• ROOTFAITH » AFFIXFAITH is proposed as a universal meta-constraint by McCarthy & Prince (1995), often cited in root/affix phonological asymmetries

• Cf. others have shown the shortcomings of this as a meta-constraint and point to cases where AFFIXFAITH ranks over ROOTFAITH [Hargus & Beavert 2004]

• However, we would still expect symmetry with dominant/replacive GT, contrary-to-fact
Three discussion points

[3] Contradicting root faithfulness

- **Hypothesis**: the functional load of lexical (i.e. underlying tone) is extremely low (crudely, very few tonal minimal pairs)
  - Little information is lost if tone is completely wiped out/replaced
  - [Hall et al 2016; Rolle, Shih, Inkelas 2018]

- If true, communication-based bias preserves and enhances grammatical exponence along ‘underutilized’ phonological dimensions - e.g. dominant/replacive tone - when lexical contrast would not be significantly compromised
  - Builds off of Hall et al.’s 2016 functionalist *Message Oriented Phonology* program, compatible with formalist OT implementation

- **Remains to be properly tested...**
Last question to end

• Do you know of any cases which contradict this dominant tone asymmetry?

• Tonal operations in which the trigger is inward compared to the target, and is of the dominant/replacive type?
  ◦ Root replacing tone of affix
  ◦ Noun or verb replacing tone of a modifier (e.g. adjective, demonstrative, etc.)
  ◦ Verb replacing tone of its object
Acknowledgments

- Sharon Inkelas and Larry Hyman
- Peter Jenks and Darya Kavitskaya
- Laura McPherson
- Myriam Lapierre
- Izon consultant and collaborator Jumbo Gift
- Kalabari experts and collaborators Otelemate Harry and Jackreece Charles
- University of Buffalo Colloquium Committee (Jeff Good and Christian DiCanio)
- UC Berkeley Oswalt grant (2017) to travel to Nigeria
References

References found in my dissertation:
  ◦ https://escholarship.org/uc/item/9v01c4vr
• Cline between concatenative (here = floating) tone and dominant/replacive tone

Floating tone

\[ \text{Input} \uparrow \text{Output} \]

a. \( \text{LM HL} \)
   \[ \begin{array}{c}
   / (\ddot{r}r) (\ddot{r}r) / \\
   (\ddot{r}r) (\ddot{r}r)
   \end{array} \]

b. \( \text{HL} \)
   \[ \begin{array}{c}
   / (\ddot{r}r) (\ddot{r}r) / \\
   (\ddot{r}r) (\ddot{r}r)
   \end{array} \]

c. \( \text{HL} \)
   \[ \begin{array}{c}
   / (\ddot{r}r) (\ddot{r}r) / \\
   (\ddot{r}r) (\ddot{r}r)
   \end{array} \]

d. \( \text{HL} \)
   \[ \begin{array}{c}
   / (\ddot{r}r) (\ddot{r}r) / \\
   (\ddot{r}r) (\ddot{r}r)
   \end{array} \]

e. \( \text{LM HL} \)
   \[ \begin{array}{c}
   / (\ddot{r}r) (\ddot{r}r) / \\
   (\ddot{r}r) (\ddot{r}r)
   \end{array} \]
Axes of variation of GT:

• **Tune-target relations**: how does the tune interact with the tone of the target? hypothetical possibilities include concatenation, replacement, deletion, blocking due to markedness, coalescence, among others.

• **Tune-trigger relations**: do these form one ‘exponent’ jointly? how different can the tonal value of the tune be from that of the trigger? how consistently does the tune co-occur with the trigger?

• **Trigger-target relations**: how local do the trigger and target need to be? should locality be defined structurally (morpho-syntactically) or linearly (in the phonological string)? Are there asymmetries as to what can be a potential trigger and what a potential target?

• **Allotuny**: does a GT tune exhibit ‘allotunes’ in complementary distribution? if so, is this conditioned by properties of the trigger? target? something else?

• **Conditioning triggerhood and targethood**: are triggers/targets conditioned by their environment? are there exceptional triggers (normally non-triggering morphemes) and exceptional targets (non-undergoing units in the target domain)?

• **Expression**: which grammatical categories can GT express? derivation/inflection? structural configurations such as [OBJECT VERB]? etc.
Other issues in GT

- **Catalysis** (exceptional triggers, which should otherwise not act as such)
  - [McPherson 2014, Heath 2016]

- **Indomitability** (exceptional non-undergoers, which should otherwise be targets)

- Restrictions on **self-docking**: the grammatical tune does not want to fall on its trigger