

# PHONOLOGICAL TEAMWORK AS CUMULATIVE MARKEDNESS

DOBES

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## 1. INTRODUCTION

- ❖ “Phonological teamwork” (Lionnet in prep.a): two segments aspiring to trigger the same phonological process (here assimilation), but too weak to trigger it on their own, may “join forces” and together pass the threshold necessary for that process to occur.
- ❖ Two logical ways of dealing with such phenomena:
  - **Phonetically grounded:** ganging up of weak phonetic effects to make a single strong influence (e.g. Flemming 1997, 2002; Lionnet in prep.b)
  - **Grammatically derived:** ganging up of weak grammatical constraints, each of which wants a categorical assimilation
- ❖ Here: second option explored
  - Woleaian a-raising
  - Laal doubly triggered rounding harmony
  - Harmonic Grammar account (Legendre et al. 1990, Smolensky & Legendre 2006) : cumulative Markedness
    - Laal: “ganging cumulativity”, i.e. two weak Markedness constraints gang up to overcome one Faithfulness violation
    - Woleaian: “counting cumulativity”, i.e. more than one violation of one weak Markedness constraint is necessary to overcome one Faithfulness violation (Jäger & Rosenbach 2006)
  - Tentative evaluation of HG account
- ❖ NB: *My ultimate goal is to compare both types of approaches* (Lionnet in prep.a)

## 4. ANALYSIS : LAAL

### AGREEMENT BY CORRESPONDENCE

- ❖ Used to account for:
  - Long-distance C agreement (Hansson 2001; Rose & Walker 2004)
  - V Harmony (Sasa 2009; Walker 2009; Rhodes 2012)
  - Long-distance C Dissimilation (Bennett 2013)
  - Local effects of assimilation/dissimilation (Inkelas & Shih 2013a,b; Shih 2013)

- ❖ Hansson’s (2014) revision: IDENT / CORR pairing replaced with targeted constraint

$*[aF][-aF] / [\beta G, \gamma H]$

MARKED SEQUENCE

penalizes any sequence of segments disagreeing in the feature [F]...

$\approx \text{IDENT-XX}[F]$

NB: similarity defined in terms of featural identity, or distance

SIMILARITY BASIS

...within the set/projection of output segments specified as  $[\beta G, \gamma H]$

$\approx \text{CORR-XX}[\beta G, \gamma H]$

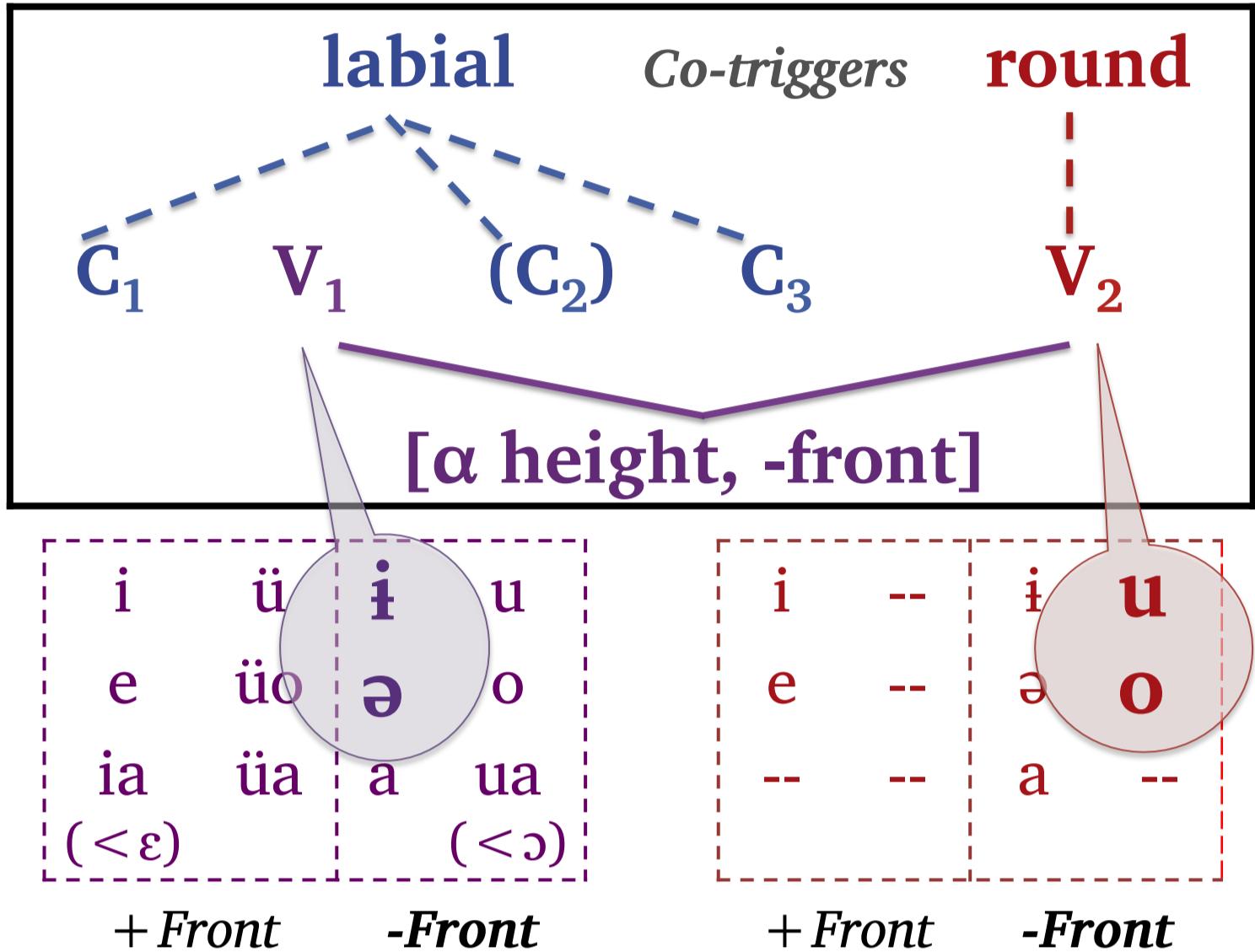
### \*C<sub>[αLAB]</sub> V<sub>[-αLAB]</sub> / ADJACENT

- A vowel and an adjacent consonant may not disagree in the feature [labial].
- Assign one violation for each pair of adjacent C<sub>[αlab]</sub> and V<sub>[-clab]</sub>
- (assuming that only potential bearers of the feature [labial], i.e. vowels and labial consonants, may violate the constraint).

## 2. DATA: LAAL

- ❖ **Laal:** isolate, ca. 750 speakers, two villages, southern Chad

- ❖ Doubly triggered rounding harmony:



### (1) V<sub>2</sub> [rd], Lab, Height, -Front > Rounding:

- a. /b̥ir + -ú/ > b̥ür-ú ‘hook-pl’
- b. /t̥àb + -ó/ > tòb-ó ‘fish(sp.)-pl’
- c. /c̥írm- + -ú/ > cùrm-ú ‘tree(sp.)-pl’
- d. /p̥áb + -ó/ > pób-ó ‘cobra-pl’

### (2) No Rounding:

- |               |          |                |   |
|---------------|----------|----------------|---|
| a. /gōbär/    | > gōbär  | ‘cloud’        | V <sub>1</sub> [rd], *V <sub>2</sub> [rd] |
| b. /pírmín/   | > pírmín | ‘dust’         | *V <sub>2</sub> [rd]                      |
| c. /gín + -ù/ | > gín-ù  | ‘net-pl’       | *Lab                                      |
| d. /bér + -ú/ | > bér-ú  | ‘plant.sp.-pl’ | *Height                                   |
| e. /bírú /    | > bírú   | ‘burn’         | *-Front                                   |

## 5. ANALYSIS: LAAL (ctn'd)

### \*[-LAB] [+LAB] / [αH,-FR]

- A labial segment may not be preceded by a non-labial segment in an output string if both segments agree in height and [-front].
- Assign one violation for each pair of neighboring segments that meet the criteria but fail to correspond.

### ❖ Laal: ganging cumulativity

| Weights     | 5          | 4                          | 2  |     |
|-------------|------------|----------------------------|--|-----|
| a. /b̥ir-ú/ | IDENT[LAB] | *[-LAB][+LAB]<br>/[αH,-FR] | *C <sub>[αLAB]</sub> V <sub>[-αLAB]</sub><br>/ADJACENT |     |
| bírú        |            | -1                         | -1   | -6  |
| ✉ bürú      | -1         |                            |  | -5  |
| bíří        | -1         |                            | -1   | -7  |
| b. /pírmín/ |            |                            |  |     |
| pírmín      | -1         |                            | -3   | -6  |
| púrmín      | -1         |                            | -1   | -7  |
| pírmún      | -1         | -1                         | -2   | -13 |
| púrmún      | -2         |                            |  | -10 |
| c. /gín-ù/  |            |                            |  |     |
| gínù        |            | -1                         |  | -4  |
| gúnù        | -1         |                            |  | -5  |
| gíně        | -1         |                            |  | -5  |
| d. /bér-ú/  |            |                            |  |     |
| bérú        | -1         |                            | -1   | -5  |
| běří        | -1         |                            | -1   | -5  |

## 3. DATA: WOLEAIAN

- ❖ Micronesian language (Sohn 1975)

| Short vowels |   |   | Long vowels |    |    |
|--------------|---|---|-------------|----|----|
| i            | ü | u | ii          | üü | uu |
| e            |   | o | ee          | öö | oo |
| a            |   |   | aa          | öö |    |

- ❖ /a/ raises to [e] between two high vowels:

$a \rightarrow e / V_{[+hi]} (C) \_ (C) V_{[+hi]}$

- (3) a. /üwa-li/ > üwe-li ‘neck of’
- b. /ülüma-mw/ > ülüme-mw ‘your drinking object’
- c. /ita-i/ > ite-i ‘my name’

### (4) No raising if only one [+hi] trigger:

- a. /üwa-la/ > üwa-le ‘our name’
- b. /libbeya-i/ > libbeya-i ‘my twins’

### (5) No raising if long VV target:

/nigaasapa/ > nigaasape ‘area below eye’

(NB: final a-raising in (2a) and (3), ignored henceforth)

## 7. DISCUSSION

- ❖ Teamwork observed only if the two weak violations are incurred by the same segment (this is what we want, and it comes for free in HG)

- ❖ Teamwork: either one constraint, or two constraints which share some feature(s) → QUANTAL Markedness, rather than simply cumulative.

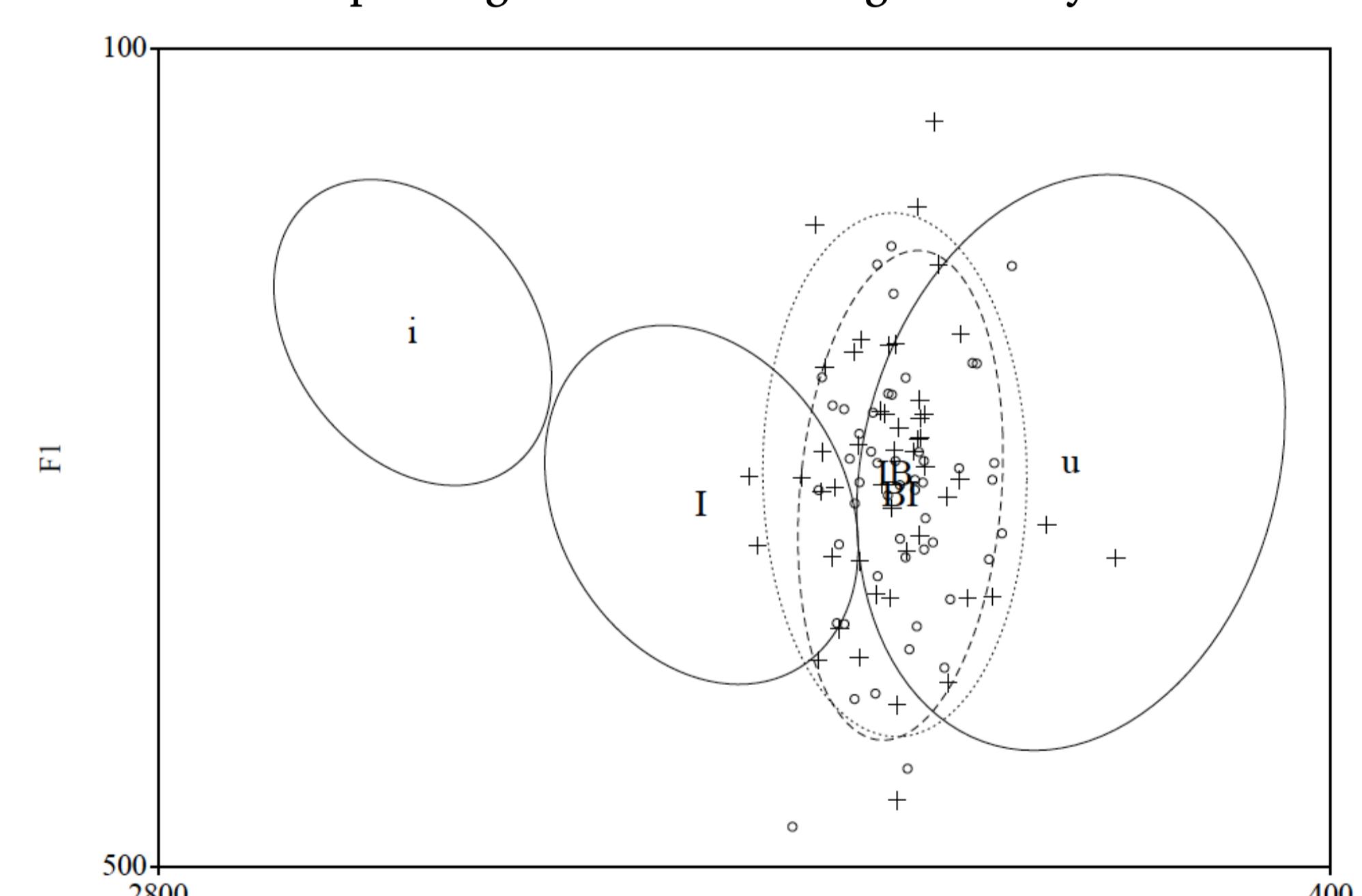
- Definition of teamwork: two triggers which aspire to trigger the same phonological process
- NOT predicted by HG: any cumulative effect is predicted to be possible → overgenerates!
- Restriction needed:
  - How can cumulative effects be restricted in HG?
  - Possible solution: cumulative effects are emergent → no need to add formal restrictions: the restrictions come from elsewhere (phonetic grounding, historical accidents, etc.)

- ❖ Comparison with Local Constraint Conjunction (Smolensky 1993, 1995): Suzuki’s (1997) account of Woleaian a-raising:

| input = /i-tai/  | *Hi→Lo | IDENT[LO] | *Hi-Lo | *Lo-Hi |
|--|--------|-----------|--------|--------|
| a. $\begin{matrix} i & t & a & i \\   &   &   &   \\ +hi & +lo & +hi \end{matrix}$ | *      | !         | *      | *      |
| b. $\begin{matrix} i & t & e & i \\   &   &   &   \\ +hi & +hi & +hi \end{matrix}$ |        | *         |        |        |

- In HG: no need to add to the machinery → simpler/elegant
- However, it is possible to impose restrictions on constraint conjunction, i.e. on cumulative effects
  - cf. Bakovic (2000:34): conjoined Faith and Mark constraints need to be “co-relevant”, e.g. share some feature(s) → extend to all conjunctions?

- ❖ Phonetic underpinnings of Laal rounding harmony:



| Average Δ             | Significance |                           |
|-----------------------|--------------|---------------------------|
| $\Delta_{F2}(i, i^b)$ | 399 Hz       | $p < 2.2 \times 10^{-16}$ |
| $\Delta_{F2}(a, a^b)$ | 286 Hz       | $p < 4.3 \times 10^{-5}$  |
| $\Delta_{F2}(a, o/u)$ | 110 Hz       | $p = 0.11$                |

- [i, a] and [i<sup>b</sup>, a<sup>b</sup>] are distinctive, but not contrastive
- ❖ Missed generalization: HG and LCC accounts would work with or without this phonetic effect
  - Hypothesis: weak constraint = weakly active?
  - E.g. \*C<sub>[αLAB]</sub> V<sub>[-αLAB]</sub> / ADJ\* heavier than [-LAB][+LAB]/[αH,-FR]
  - Can scalar effects be translated into a weight scale in OT?