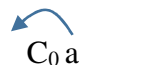



## Directionality and opacity wrap-up

21 November 2017

### 1 The debate over rule application (drawing a lot on Vago 1992)

- There was a whole literature looking for universal principles of how rules should apply when there are multiple-target issues
- Direction
  - Woleaian  $\mathbf{a} \rightarrow \mathbf{e} / \_ \mathbf{C}_0 \mathbf{a}$  applies left-to-right (Sohn 1975)
    - /mata+mami/ → [matemam] ‘our eyes’
    - *not* /mata+mami/ → matemami → \*[metemami]
  - Is that because the context is on the right??
  - Or because right-to-left application leads to transparent application (self-bleeding rather than self-counterbleeding)??
  - Or is it an arbitrary property of the rule that must be stipulated (and learned), just like the fact that the target is /a/?
- Iterativity
  - Hidatsa  $\mathbf{V} \rightarrow \emptyset / \_ \#$  applies only once (Kenstowicz & Kisseberth 1977)
    - /kikua/ → [kiku] ↗ \*[kik] (but the language does allow final consonants) ‘set a trap!’
  - Whereas Tshiluba  $\mathbf{l} \rightarrow \mathbf{n} / [+nasal] \mathbf{V}_0 \_$  can apply multiple times (Howard 1972)
    - /u+d<sup>y</sup>im+il+ile/ → u+d<sup>y</sup>im+in+ile → [u+d<sup>y</sup>im+in+ine] ‘he cultivated (benefactive)’
  - Is this just an arbitrary property?
- SPE (Chomsky & Halle 1968): simultaneous application
  - Find all strings that meet the structural description, and apply to them simultaneously
  - No self-feeding, no self-bleeding: clearly incorrect
- Johnson 1970: directional application
  - Every rule is tagged as left-to-right or right-to-left
  - You can define directionality to prevent Hidatsa final deletion from being self-feeding
    - Once you’ve looked at *kikua#*, and deleted (*kiku#*) you have to move leftward (*kiku#*), and you won’t find any more matches to the structural description
- Howard 1972: environment-to-target direction
  -   $\_ \mathbf{C}_0 \mathbf{a} \rightarrow$  right-to-left (whoops, doesn’t work for Woleaian)
  -   $[+nasal] \mathbf{V}_0 \_ \rightarrow$  left-to-right
  - General trend, but he notes some exceptions
  - Plus, what about two-sided environments?
    - Tübatulabal vowel lengthening:  $\mathbf{V} \rightarrow [+long] / \{ \#, shortV \} \mathbf{C}_0 \_ \mathbf{C}_0 \{ \#, shortV \}$
    - Howard proposes that these are all right-to-left

- Jensen & Stong-Jensen 1973: direction depends on features
  - segmental and tone rules: apply in direction that yields self-feeding or self-counterbleeding
  - stress, gliding, and vowel deletion: apply in direction that is self-bleeding
  - This makes sense in terms of markedness constraints that can block the rule
    - stress: likes to alternate (stressed-unstressed-stressed-unstressed)
      - $V \rightarrow [+stress] / [V, -stress] C_0 \_$
      - What happens if you apply it, in each direction, to /tábopatibilemu/?
    - gliding: “purpose” is to avoid VV, not to produce CC
      - $[V, +high] \rightarrow [-syllabic] / \_V$
      - What happens if you apply it, in each direction, to /eniniu+ak/?
    - vowel deletion: tends to be blocked by excessive consonant clusters
      - $i \rightarrow \emptyset / VC\_CV$  but suppose \*CCC
      - What happens if you apply it directionally vs. simultaneously to /tapibilimak/?
  - And yet, there are cases where this still doesn’t tell us the direction
    - apply  $i \rightarrow \emptyset / VC\_CV$  to /kelifiko/
- Vago, by the way, concludes that we haven’t found any principles that quite work, though there might be tendencies that are worth capturing somehow

## 2 Can speech planning help?

- Most of the cases I’ve found in that literature are rules that apply within a single word
  - We’ve seen that the planning window for phonological encoding is at least about a word
  - So probably the whole word is available in the workspace
    - You know what the vowel pattern of /mata+mami/ is before you have to commit to whether the first /a/ is raised to [e]
  - On the other hand, the first syllable of a word does seem to be encoded first (Meyer 1990; Meyer 1991)
    - So Woleaian might still be a bit harder than if it applied in the opposite direction

- I'm not sure whether we should expect evidence of planning pressures in these single-word cases

- except maybe in languages that can productively combine a stem with a long string of affixes?
- They might have to have a shorter planning window
- Turkish example/digression:

muvaffak-iyet-siz-leş-tiri-ci-leş-tiri-vere-meye-bil-ecek-leri-miz-den-miş-siniz-cesine  
 successful-ness-without-become-cause-er-become-cause-easily-not-can.cause-  
 who.those.we.among.happens.to.have.been-you-as.though

‘as though you are from those whom we may not be able to easily make into a maker of unsuccessful ones’

See [en.wikipedia.org/wiki/Longest\\_word\\_in\\_Turkish](http://en.wikipedia.org/wiki/Longest_word_in_Turkish) for the context that sets this up (seems to be from a newspaper):

*Kötü amaçların güdüldüğü bir öğretmen okulundayız. Yetiştirilen öğretmenlere öğrencileri nasıl muvaffakiyetsizleştirecekleri öğretiliyor. Yani öğretmenler birer muvaffakiyetsizleştirci olarak yetiştiriliyorlar. Fakat öğretmenlerden biri muvaffakiyetsizleştirci olmayı, yani muvaffakiyetsizleştircileştirilmeyi reddediyor, bu konuda ileri geri konuşuyor. Bütün öğretmenleri kolayca muvaffakiyetsizleştircileştiriverebileceğini sanan okul müdürü bu duruma sinirleniyor, ve söz konusu öğretmeni makamına çağırıp ona diyor ki: "Muvaffakiyetsizleştircileştiriveremeyebileceklerimizdenmişsinizcesine laflar ediyormuşsunuz ha?"*

*We are in a teachers' training school that has evil purposes. The teachers who are being educated in that school are being taught how to **make unsuccessful ones** from students. So, one by one, teachers are being educated as **makers of unsuccessful ones**. However, one of those teachers refuses to be **maker of unsuccessful ones**, in other words, to be **made a maker of unsuccessful ones**; he talks about and criticizes the school's stand on the issue. The headmaster who thinks every teacher **can be made easily/quickly into a maker of unsuccessful ones** gets angry. He invites the teacher to his room and says "You are talking **as if you were one of those we can not easily/quickly turn into a maker of unsuccessful ones**, right?"*

- But if I can get the computer working, I think it's instructive to watch these videos:
  - <https://www.youtube.com/watch?v=L5W35rOychM>
  - <https://www.youtube.com/watch?v=BUeNM2Qq0ow>
  - <https://www.youtube.com/watch?v=QlbQ9q-Uujo>

### 3 Hence the focus on tone sandhi

- Productive (we hope) processes that can apply across whole phrases and potential self-feed/bleed
  - though as Isabelle said, we may need to distinguish the *familiar soups* from the *unfamiliar soups*
- As we've seen, there can be all kinds of application issues
  - Direction
    - $A \rightarrow B / \_ A$  applied to /AAA/?
  - Competing rules, not necessarily with consistent ordering
    - $B \rightarrow D / \_ C$ ,  $B \rightarrow E / A \_$  applied to /ABC/?

### 4 One unusual solution: Yantai Mandarin (Chen 2000)

214 → 55 /  $\_ 214$   
 / 214 214 31 /  
 214 → 35 /  $\_ 31$



[https://commons.wikimedia.org/wiki/File:China\\_edcp\\_location\\_map.svg](https://commons.wikimedia.org/wiki/File:China_edcp_location_map.svg),  
 Uwe Dederling

- Which direction wins?
  - $\underline{214} \underline{214} 31 \rightarrow \mathbf{55} \underline{214} 31 \rightarrow \mathbf{55} \mathbf{35} 31$
  - $214 \underline{214} \underline{31} \rightarrow 214 \mathbf{35} 31$  (bleeding)
- Neither!
  - /X Y 31/ → [**31 35** 31], regardless of what X and Y are
  - /X Y 214/ → [**55 55** 214]
    - surprising, because there's also a rule  $55 \rightarrow 31 / \_ 55!$
  - /X Y 55/ → [**33 21** 55]
- Determine whether you're dealing with a two-syllable or three-syllable chunk
  - in every case, there is then just one rule to apply

### 5 Chen (2000): putting planning pressures in the grammar

- Remember we saw three main ideas about why speech errors and OCP/harmony should be similar
  - speech errors accumulate diachronically and get phonologized
  - constraints based on error-susceptibility are available for grammars
  - speech errors are just a window into what the system favors
    - favored things get a boost in diachrony
- Chen's approach: incorporate planning constraints directly into the grammar

## 6 Chen's analysis of Changting Hakka

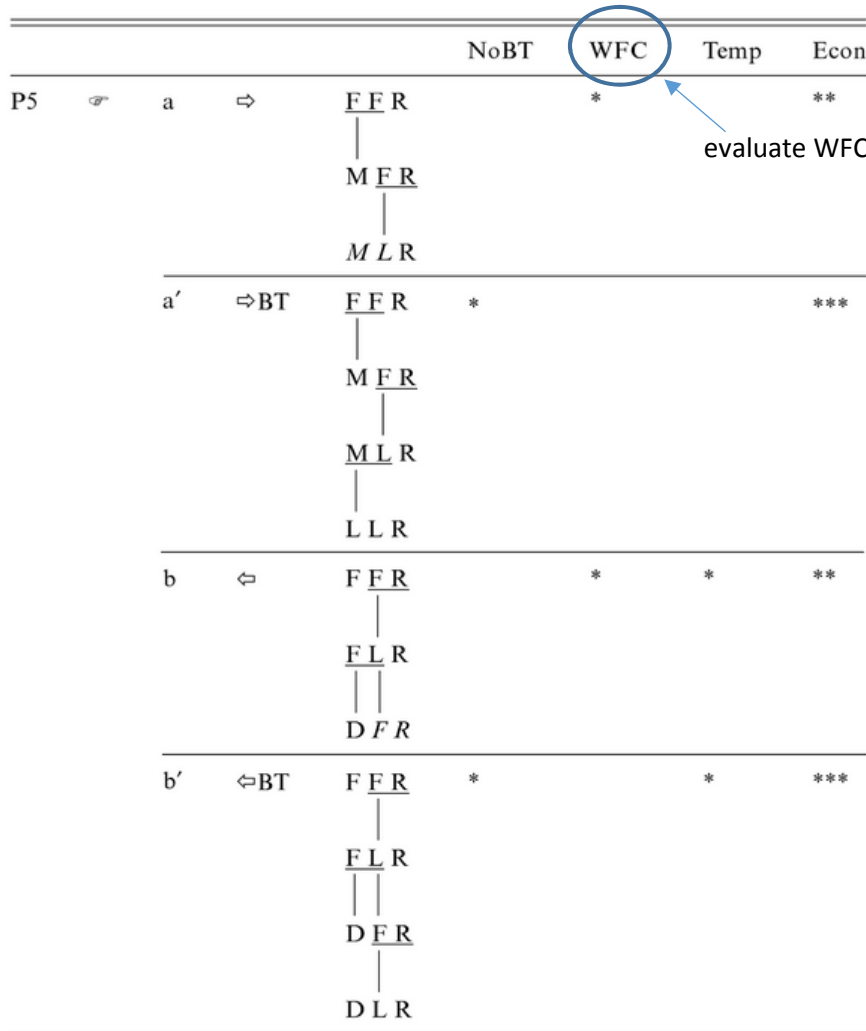
- A candidate is a derivation (= a sequence of planning steps?)
  - TEMPORALSEQUENCE: work through the sequence from beginning to end
  - NOBACKTRACKING: don't go back and revise
  - ECONOMY: one violation for each step
  - WFC: well-formedness constraints
    - \*M {L LH}
    - \*L {H, M, HL}
    - \*LH {M, L}
    - \*HL {M, L, LH, HL}



Google maps: Changting county

HL HL → M HL  
 /HL HL LH/ → [M L LH]  
 HL LH → L LH

{gan<sup>HL</sup> cao<sup>HL</sup>} xie<sup>LH</sup>  
 [gan<sup>M</sup> cao<sup>L</sup> xie<sup>LH</sup>]  
 'straw sandals'  
 da<sup>HL</sup> {tu<sup>HL</sup> hao<sup>LH</sup>}  
 [da<sup>M</sup> tu<sup>L</sup> hao<sup>LH</sup>]  
 'attack the local tyrants'



evaluate WFC based on end of derivation (bottom)

normally M L → L L

normally HL LH → L LH (D = dipping)

(p. 151)

- Is this derivation really calculated in real time, or is there a pre-compiled rule for each three-tone sequence?
  - If pre-compiled, we expect some of the rules to drift diachronically, and thus resist analysis

## 7 The rest of this course: just 4 sessions left!

- Topics left
  - Phonetic and phonological paradigm uniformity, and other effects of lexical access on pronunciation
    - **Kirov & Wilson 2013, Munson 2007**
    - **Bermúdez-Otero 2010, Seyfarth et al. 2017**, Braver & Kawahara 2015, Barnes & Kavitskaya 2002, Riehl 2003, Steriade 2000
  - Speech planning and word structure
    - Himmelmann 2014
  - Proposals about the relationship between grammar and planning
    - Zuraw 2009, Bermúdez-Otero 2012, **Smolensky & Goldrick 2016, Tamminga, MacKenzie & Embick 2017**

| <i>when</i>         | <i>what</i>  | <i>who</i>   |
|---------------------|--|--|
| ▪ Tuesday, Nov. 28  | Kirov & Wilson 2013  | Present: _____   |
|                     | Munson 2007  | Present, and react to Kirov & Wilson model from Munson's point of view: _____  |
| ▪ Thursday, Nov. 30 | Seyfarth et al. 2017<br>Bermúdez-Otero 2010  | Present Seyfarth and rebut B-O: _____<br>Present B-O and rebut Seyfarth: _____ |
| ▪ Tuesday, Dec. 5   | Smolensky & Goldrick 2016  | Present: _____   |
|                     | Tamminga, MacKenzie & Embick 2017  | Present: _____   |
| ▪ Thursday, Dec. 7  | space for catching up<br>course wrap-up (I'll briefly cover Himmelmann 2004 if time) | Kie  |

## 8 Brief orientation to our next topic

- What about the effect of speech planning on phonetics?
  - Does the way a word is retrieved affect its pronunciation in subtle, sub-phonological ways?
  - Should the phonological grammar account for this?
  - Does the phonological grammar restrict or affect such effects?
  - Does any of it get phonologized?
- More specifically, can the representation of a related word affect pronunciation?
  - In my dialect, ‘writing’ is [ɪAɪrɪŋ], with raised vowel despite following voiced consonant
    - because it’s related to ‘write’ [ɪAɪt]
    - known as paradigm uniformity (Steriade 2000; Kenstowicz 2002; Benua 1997; and others)
  - But what about ‘bleating’ [blɪrɪŋ]—is the [i] subtly shorter because it’s related to ‘bleat’ (and /i/ is shorter before a voiceless consonant)?

### *Relevance to phonology*

- If there is phonetic paradigm uniformity, is that the source of (phonologized) paradigm uniformity?
- Similarly to speech errors and similarity/dissimilarity processes, could phonetic paradigm uniformity be a window into what makes phonological paradigm uniformity likely?

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