1 What’s the problem with counterbleeding in OT?

- Chinese example: 3rd (aka 213) tone sandhi

- Derivational analysis

2 People have come up with various ways to make some (self-)counterbleeding go away


  - No, vowel raising is **unproductive**
  - doesn’t exist in other languages
  - no phonetic motivation
  - lots of exceptions ([pɔr] ‘leek’)
  - didn’t apply in a wug test
  - not part of a Polish accent when speaking other languages

  - Analysis: /grɔb/ and /grup/ are both listed allomorphs
• Pater (1999): W. Austronesian obstruent deletion counterbleeds nasal assimilation?
  ▪ No, the two consonants just fuse in one step
    ▪ /manŋ+sulsi/ → [man₁₂ulsi]  

  ▪ Works for any case where a segment spreads some of its features and then deletes
  ▪ No problem in OT
  ▪ As long as we do some fancy footwork to ensure the right features

<table>
<thead>
<tr>
<th>/manŋ+sulsi/</th>
<th>*ŋ+OBSTRENUENT</th>
<th>MAX-C</th>
<th>IDENT(place)/obstruent</th>
<th>IDENT(place)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a manŋ₁₂ulsi</td>
<td>*!</td>
<td></td>
<td>“If an input obstruent and a surface segment correspond, they must have the same place of articulation”</td>
<td>*!</td>
</tr>
<tr>
<td>b manŋ₁₂ulsi</td>
<td>*!</td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c man₁₂ulsi</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>d manŋ₁₂ulsi</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>e manŋ₁₂ulsi</td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

  ▪ English tapping counterbleeds Canadian Raising?
  ▪ No, it’s paradigm uniformity

<table>
<thead>
<tr>
<th>/rajt+ə/</th>
<th>*aj[–voice]</th>
<th>*VtV (roughly!)</th>
<th>IDENT(low)-BaseOutput</th>
<th>IDENT(low)-Output</th>
<th>IDENT(cont)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a ḏajtə</td>
<td>*!</td>
<td>*!</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>b ḏajɾə</td>
<td></td>
<td>*!</td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>c ḏajtə</td>
<td></td>
<td></td>
<td>*!</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>d ḏajɾə</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>*</td>
</tr>
</tbody>
</table>

3 Speech planning could be another source of apparent counterbleeding

• The transparent candidate is actually more difficult to plan
  ▪ because the rule’s trigger is in the future, compared to the target: 213 → 35 / __ 213

• Planning transparent [xiao²¹³ gou⁴⁵ pao²¹³]
4 What does it mean for the grammar?

- It’s not like [ xiao\textsuperscript{35} gou\textsuperscript{35} pao\textsuperscript{213} ] is a speech error
  - The grammar still needs to mark the counterbleeding candidate as grammatical

- Maybe not only is the speech-planning window variable, but the “grammar window” is variable
  - One derivation is the whole string \( \rightarrow \) bleeding

<table>
<thead>
<tr>
<th></th>
<th>/xiao\textsuperscript{213} gou\textsuperscript{213} pao\textsuperscript{213}/</th>
<th>*213 213</th>
<th>IDENT(\text{\textsc{tone}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>xiao\textsuperscript{213} gou\textsuperscript{213} pao\textsuperscript{213}</td>
<td><em>!</em></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>xiao\textsuperscript{35} gou\textsuperscript{213} pao\textsuperscript{213}</td>
<td>*!</td>
<td>*</td>
</tr>
<tr>
<td>c (\not\in)</td>
<td>xiao\textsuperscript{213} gou\textsuperscript{35} pao\textsuperscript{213}</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>xiao\textsuperscript{35} gou\textsuperscript{35} pao\textsuperscript{213}</td>
<td>**!</td>
<td></td>
</tr>
</tbody>
</table>

- Another derivation is two words at a time \( \rightarrow \) counterbleeding

<table>
<thead>
<tr>
<th></th>
<th>/xiao\textsuperscript{213} gou\textsuperscript{213} /</th>
<th>*213 213</th>
<th>IDENT(\text{\textsc{tone}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>xiao\textsuperscript{213} gou\textsuperscript{213}</td>
<td>*!</td>
<td></td>
</tr>
<tr>
<td>(\not\in) b</td>
<td>xiao\textsuperscript{35} gou\textsuperscript{213}</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

- In this sentence, we might expect this cyclicity by the syntactic bracketing anyway:
  - [ xiao gou]\text{DP} [pao]\text{VP}
  - e.g., Duanmu (2007) (and many others!)

- When bracketing is different, both options are still possible, though in different proportions (right?)
  - [gou]\text{DP} [hen hao]\text{VP}
    - dog very good ‘The dog is good’

- So we’d need to allow the grammar to look at sequences incrementally \textit{even when the syntax doesn’t justify it}
  - unless we want to give up on standard OT
5 Planning-related predictions

• The counterbleeding candidate is “easier”
  ▪ increased difficulty (verbal-working-memory load, lower frequency/predictability of upcoming word) should favor counterbleeding

• The difficulty comes in knowing the tones of words in the future
  ▪ A sandhi rule that doesn’t care what tone comes next shouldn’t show (as much?) counterbleeding
    ▪ assume there is such a thing as a syllable with no tone
    ▪ just interpolate the pitch
    ▪ 213 → Ø / __T
    ▪ i.e., delete the 213 tone if the next syllable has any tone
  ▪ During planning of /xiao^{213}/, we know enough about /pao^{213}/ to know that we don’t need to change /xiao^{213}/’s tone:

    /xiao^{213}/ has been retrieved—deciding whether to apply the rule
    /gou^{213}/ has been retrieved (provides __T environment)
    /pao^{213}/ maybe still in process of being retrieved—but we know it will have some tone

• A right-to-left rule shouldn’t show any such effects
  ▪ increased difficulty (verbal-working-memory load, lower frequency/predictability of upcoming word) should favor counterbleeding
  ▪ Hypothetical Niradnam Nichese 3rd tone sandhi:
    ▪ 213 → 35 / 213 __
    ▪ for input /oaix^{213} oug^{213} oap^{213}/…
      ▪ transparent: [oaix^{213} oug^{35} oap^{213}]
      ▪ counterbleeding: [oaix^{213} oug^{35} oap^{35}]
  ▪ No planning difficulty with the transparent candidate

    /oaix^{213}/ has been retrieved and planned, [oaix^{213}]
    /oug^{213}/ has been retrieved and planned, [oug^{35}]
    /oap^{213}/ previous syllable is not [213], rule doesn’t apply
What is left for (self-)counterbleeding?

- If Niradnam Nichese 3rd tone sandhi existed, then we’d really have to take (self-)counterbleeding seriously...

A typology of directionality and self-(counter){f,b}leeding

- Jensen & Stong-Jensen 1973, p. 74
  - propagating = iterative
  - alternating = self-bleeding
8  Directionality more generally

- Self-feeding also presents a challenge when it applies right-to-left

- McHugh 1990: Kivunjo Chaga (Bantu, Tanzania)
  - Inserted, accented H spreads left
    - (S=superhigh)

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<table>
<thead>
<tr>
<th>naiolonga msubsli</th>
<th>naiolonga mkipfi</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLH L * H*L p</td>
<td>SLH L * H*L p</td>
</tr>
</tbody>
</table>
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(p. 54)

- “It may therefore [because it isn’t stopped by word boundaries] spread back indefinitely within the p-phrase until it reaches a H tone.” (p. 56)

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<table>
<thead>
<tr>
<th>Ngeciizrima iulra nyama ya umbe ya msubsli</th>
</tr>
</thead>
<tbody>
<tr>
<td>S L HH L * H*L p</td>
</tr>
</tbody>
</table>
```

(p. 57)

- I don’t know if “may” means that the spread is optional
  - or just means that circumstances can exist that cause arbitrarily long spread
- If it’s not optional, this is pretty demanding on speakers!
  - especially if there isn’t an option to break up the utterance into shorter p-phrases

9  References