Class 17: Structure above the segment, part I

To do

- Holoholo HW due tomorrow (Friday).
- Last study questions due Tuesday—Hayes 1995.
- No assignment posted tonight—last one will be posted Tuesday night, due Friday, Dec. 5.
- Draft project abstract due Tuesday.

Overview

In a lot of ways, stress doesn’t look like a feature. Accordingly, a type of representation called a grid has been proposed, to which stress rules apply.

1. A little background on syllables

- Segments seem to be grouped into syllables, which themselves show evidence (that we won’t discuss) of internal structure:

```
  σ
onset  rime  σ
  σ
onset  rime
  nucleus coda  nucleus coda
```

- Although SPE eschewed syllables, they were quickly readopted because they allow simplification of lots of rules and constraints (e.g., all “/___{C,#}” rules)
- It’s not always clear where the boundaries between syllables are (given? given? given?)
- Be skeptical of sources that claim a syllabification as though it were observable data—syllabification is always part of a phonological analysis.
  - E.g. Spanish[kó.pja] ‘copy’
    - explains why the /j/ has its non-syllable-initial allophone ([j] rather than [j])
    - consistent with claim that Spanish forbids [p] in coda (since we don’t observe them word-finally or before non-gliding/liquid Cs)
    - consistent with claim that Spanish allows [pj] onset, since words can begin [pj]
  - vs. Tagalog [kóp.ja] ‘copy’ (loan from Spanish)
    - explains why suffixed form is [kópjaa-hin] ~ [kópjaa-hín] (only roots with stressed, closed penult show this pattern)
    - consistent with observing lots of words that end in [p]
- Stress seems to be a property of syllables, not segments
  - You can’t have a syllable where the onset C is [+stress] and the nucleus V is [–stress], for example.
2. **What is stress?**

- Not all languages have it.
- Among those that do, stress doesn’t have a fixed phonetic realization. Stressed syllables tend to:
  - have longer duration
  - be louder
  - support a larger set of vowel contrasts (see Crosswhite 2001; Barnes 2006 for surveys)
  - have longer VOT, more fortition on their consonants (see Lavoie 2001; González 2002 for surveys)
  - attract glottalization and aspiration away from unstressed
  - be associated with pitch excursions (high or low, depending on utterance melody)

- This means stress isn’t something you can hear, see in a spectrogram, or ask a speaker to intuit—it’s the result of a phonological analysis to explain traits like those listed above.
  - That’s why phonologists can disagree about a word’s stress pattern, or even about whether a certain language has stress (French, Korean...)

- It’s better to define stress as an abstract prominence relation:
  - Some syllables are more prominent (stressed) than others, and this has phonetic and phonological consequences, depending on the grammar, such as those listed above.

3. **Stress as a feature? (see Hayes reading for more)**

- Other features don’t (usually) shift from segment to segment based on distance from a word edge:

<table>
<thead>
<tr>
<th>origin</th>
<th>original</th>
<th>originality</th>
</tr>
</thead>
<tbody>
<tr>
<td>photograph</td>
<td>photographer</td>
<td>photographe</td>
</tr>
</tbody>
</table>

- Other features don’t (usually) act at long distances across other instances of that feature:

  Mississippi vs. Mississippi législators

- Languages don’t require every content word to have at least one + value of other features (except maybe [syllabic], which not all theories have).
- For just about every other feature, there is some language where it assimilates—but I know of no rules of stress assimilation, only stress dissimilation.

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1 This is what makes stress different from pitch accent. A pitch-accented syllable always gets the same tone or tone contour. So what makes pitch accent different from tone? Maybe nothing really: see Hyman 2009.
4. The grid

- The prominence relation is often represented as a grid (Liberman 1975).
  - Rows (a.k.a. ‘layers’) represent degrees of stress;
  - columns are associated with stress-bearing units (syllables, typically).

\[
\begin{array}{ccc}
  x & x & x \\
  x & x & x \\
  x & x & x & x & x & x \\
\end{array}
\]

Example from Hayes

- Grids are assumed to be subject to the (inviolable) Continuous Column Constraint
  - For every grid mark (except on the bottom layer) there must be a grid mark in the same column on the layer below.

5. Payoff I: Locality

- English phrasal stress rule (a.k.a. nuclear stress rule)
  - Place main stress on the last word of a phrase,\(^2\) even though this is sometimes several syllables from the end of the phrase
  - Example from Hayes: *hypothetical imitators*, which could also perhaps be *hypothetical imitators*.

- The grid allows us to state the rule very locally.
  - Any amount of white space is allowed between and on either side of \(x\)s on the same layer when matching representations up to the structural description
  - The structural description could match any (adjacent) rows of the grid:

\[
\begin{bmatrix}
  x \\
  x
\end{bmatrix} \rightarrow \begin{bmatrix}
  x \\
  x
\end{bmatrix}
\]

\(= \) “if the top layer of the grid has exactly two marks, add another mark to the second one”

- Draw grids for *hypothetical* and *imitators* in isolation, then put them together and apply this rule.

\(^2\) This can be overridden by focus. Also, watch out for compounds.
• The optional English **rhythm rule** (Prince 1983): really an interaction between a constraint **NoCLASH** and a rule Move-X.

  **NoCLASH:** * x x  (if two grid marks are adjacent on their layer, the grid marks under x x  them can’t also be adjacent on their layer)

  **Move-X:** Move one grid mark along its layer (triggered by No-CLASH)

  English-specific detail: only leftward movement is allowed here.

  o Draw the grids for *Mississippi* and *legislators*. If you put them together, is No-CLASH violated?

  o Apply Move-X if necessary—where can X move to without violating the Continuous Column Constraint?

  o In what way might this operation appear non-local? In what way is it local?

6. **Payoff II: Consequences of the Continuous Column Constraint**

  • **The rich get richer**: in the rhythm rule, Prince notes that the stress retracts onto the strongest preceding syllable. Here are some of Hayes’s examples.

  o Draw grids for *Sunset Park* and *Zoo*, and then put them together and apply Move-x to resolve/alleviate the clash. What would be the permissible landing sites for the moved x if the Continuous Column Constraint didn’t exist?
Let’s use the rhythm rule to figure out grids for totalitarian tendencies (more than one possible outcome?) and Constantinople trains.

And the poor get poorer (Hayes): Consider the derivation of paréntal from pàrent.
- When –al is added, assume that, rather than recalculating stress entirely, the Level 2 stress rules merely add stress to the penult (pàréntal).
- Then assume that main stress is assigned to rent (pàréntal).

Draw the grid for pàréntal. What constraint is now violated? Can Move-X help?

Assume a rule ‘Delete (one) x’ that can be triggered by constraint violation (though not by NoCLASH, apparently). What options do we have for applying that rule?

7. The perfect grid—describing four basic stress systems

Prince proposes that the four basic stress types of Hayes 1980 can be achieved through setting two parameters for lining up syllables with a perfect grid:

```
  x   x   x
  … x x x x x x x …
```

(a) where to start on the grid: peak or trough
(b) where to start in the word: beginning or end

What are the parameter settings for each of the following four languages (don’t worry about primary vs. secondary stress)? [taken from Hayes]
Maranungku (aka Maranunggu, Australian lang. from Australia, highly endangered; data orig. from Tryon 1970)

tí.ralk ‘saliva’
mé.re.pèt ‘beard’
yán.gar.mà.ta ‘the Pleiades’
láng.ka.rà.te.ò ‘prawn’
wè.le.pè.ne.màn.ta ‘kind of duck’

Weri (Trans-New Guinea, PNG, 4,000 speakers; data orig. H. Boxwell & M. Boxwell 1966)

njin.típ ‘bee’
kù.li.pú ‘hair of arm’
u.lù.a.mít ‘mist’
à.ku.nè.te.pál ‘times’

Warao (Language isolate, Venezuela, 28,000 speakers; data orig. from Osborn 1966)

yi.wà.ra.ná.e ‘he finished it’
yà.pu.rù.ò.ki.tà.ne.há.se ‘verily to climb’
e.nà.ho.rò.a.hà.ku.tà.i ‘the one who caused him to eat’

Araucanian (data originally from Echeverria & Contreras 1965)
Family consisting of Mapudungun (Chile & Argentina, 300,000 speakers) & Huilliche (Chile, 2000 speakers).

wu.lé ‘tomorrow’
ti.pán.to ‘year’
e.lú.mu.yù ‘give us’
e.lú.a.è.new ‘he will give me’
ki.mú.ba.lù.wu.lày ‘he pretended not to know’

• Additional parameter: add a grid mark on the top level at either the beginning or the end of the word.

○ Which setting does each of the four languages above have?

○ Consider Araucanian elúmuyù: how does the extra grid mark end up in the right place?

Next time: Adding feet to the grid; ALIGN constraints.
Now we’ll look at some abstracts I brought

References