

Class 17: Structure above the segment, part I

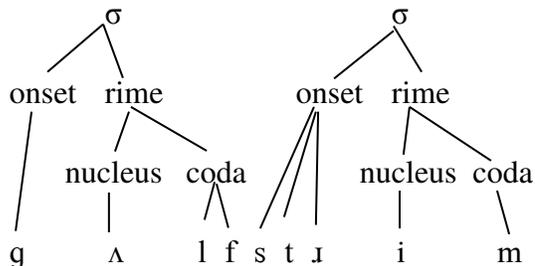
To do

- Lama HW due Tuesday
- Last study questions due Monday—Hayes 1995.
- No assignment posted tonight—last one will be posted Tuesday night, due Friday, Dec. 2.
- Draft project abstract due by end of Wednesday—upload on CCLE is possible (PDF please).

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:



- 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 (gi.ven? giv.en? giv.ven?)
- 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 [ɟ])
 - consistent with claim that Spanish forbids [p] in coda (since we don't observe them word-finally or before non-glide/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 [kóp.ja-hin] ~ [kòp.ja-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)¹
- 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 (usually) don't shift from segment to segment based on distance from a word edge:

órigin oríginal orìginálicity
 phótogràph photógrapher phòtográphic

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

Mìssissíppi vs. Míssissìppi législàtors

- 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.

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* (Lieberman 1975).
 - Rows (a.k.a. ‘layers’) represent degrees of stress;
 - columns are associated with stress-bearing units (syllables, typically).

| | | | | | | | | | | |
|-----------|------------|-----------|-----------|----------|-------------|---|--|--|--|--|
| | | | | x | | | | | | |
| x | | | | x | | | | | | |
| x | | x | | x | | | | | | |
| x | x | x | x | x | x | x | | | | |
| <i>re</i> | <i>con</i> | <i>ci</i> | <i>li</i> | <i>a</i> | <i>tion</i> | | | | | |

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 xs on the same layer when matching representations up to the structural description
 - The structural description could match any (adjacent) rows of the grid:

$$\begin{bmatrix} \\ \end{bmatrix} \rightarrow \begin{bmatrix} x \\ x \end{bmatrix}$$

= “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.
- Draw the grids for *Mississippi* and *legislators*. If you put them together, is NO-CLASH violated? A: yes, B: no
- Apply Move-X if necessary—where can X move to without violating the Continuous Column Constraint? A: *Mi*, B: *ssi*, C: *ppi*, D: *gi*
- 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.
- Draw grids for *Sunset Park* and *Zoo*, and then put them together and apply Move-x to resolve/alleviate the clash. Where can the moved x land? A: *Sun*, B: *set*, C: *Park*, D: *Zoo*

- 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 *párent*.
 - When *-al* is added, assume that, rather than recalculating stress entirely, the Level 2 stress rules merely add stress to the penult (*páréntal*).
 - Then assume that main stress is assigned to *rent* (*pàréntal*).

- Draw the grid for *pàréntal*. What constraint is now violated? Can Move-X help? A: Yes, move an X to *pa*, B: yes, move an X to *rent*, C: yes, move an X to *al*, D: no

- Assume a rule 'Delete (one) *x*' that can be triggered by constraint violation. 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.tì | 'prawn' |
| wé.le.pè.ne.màn.ta | 'kind of duck' |

| |
|----------------------|
| A: peak, beginning |
| B: peak, end |
| C: trough, beginning |
| D: trough, end |

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

| | |
|----------------|---------------|
| ŋin.típ | 'bee' |
| kù.li.pú | 'hair of arm' |
| u.lù.a.mít | 'mist' |
| à.ku.nè.te.pál | 'times' |

| |
|----------------------|
| A: peak, beginning |
| B: peak, end |
| C: trough, beginning |
| D: trough, end |

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

| | |
|-------------------------|---------------------------------|
| yì.wà.ra.ná.e | 'he finished it' |
| yà.pu.rù.ki.tà.ne.há.se | 'verily to climb' |
| e.nà.ho.rò.a.hà.ku.tá.i | 'the one who caused him to eat' |

| |
|----------------------|
| A: peak, beginning |
| B: peak, end |
| C: trough, beginning |
| D: trough, end |

Araucanian (data originally from Echeverria & Contreras 1965)

Family consisting of Mapudungun (Chile & Argentina, 300,000 speakers) & Huilliche (Chile, 2000 speakers).

| | |
|--------------------|----------------------------|
| wu.lé | 'tomorrow' |
| ḟi.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' |

| |
|----------------------|
| A: peak, beginning |
| B: peak, end |
| C: trough, beginning |
| D: trough, end |

- 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.

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