Class 15: Stress I

To do
• Start Nanti assignment
• Read Kager (SQs due Tuesday)

1. Stress as a feature?
• Other features don’t shift from segment to segment based on distance from a word edge (well, not usually...):
  origin original originality
  photográph photógrapher phôtográfic
• Other features don’t act at long distances (well, not usually...):
  Mississippi vs. Mississíppi législàtors
• Languages don’t require every content word to have at least one + value of other features (except maybe [syllabic], which, in the CV-skeleton theory, is not a feature any more).
• For just about every other feature, there is some language where it assimilates—but I know of no rules of stress assimilation.

2. The grid
Instead, stress is often represented as a grid (Liberman 1975). The rows (a.k.a. ‘layers’) represent degrees of stress; the columns are associated with stress-bearing units (syllables, in the simple cases).
Example from Hayes (1995):

    x
    x
    x
    x
    x
    x
    re con ci li a tion

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.

3. Payoff I: Locality
English phrasal stress rule (a.k.a. nuclear stress rule): Places main stress on the last word of a phrase,¹ even though this is sometimes several syllables from the end of the phrase (example from Hayes: hypothètical ímitators, which could also perhaps be hypothetical ímitators).

¹ This can be overridden by focus. Also, look out for compounds.
The grid allows us to state the rule very locally. It’s assumed that 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:

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

- Draw grids for hypothetical and imitators and apply this rule.

The English rhythm rule (Prince 1983): really an interaction between a constraint No-Clash and a rule Move-X.²

- No-Clash: * $x$ $x$ (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)

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

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

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

4. 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.

- Draw grids for Sunset Park and Zoo, and then put them together and apply Move-x to resolve the clash. What would be the permissible landing sites for the moved $x$ if the Continuous Column Constraint didn’t exist?

² The rhythm rule is usually optional.
Let’s use the rhythm rule to figure out the grids for totalitarian tendencies and Constantinople trains.

And the poor get poorer: Consider the cyclic derivation of a word like paréntal (from pârent). When –al is added to pârent, assume that, rather than recalculating stress entirely, the Level 2 stress rules merely add stress to the penult (pârëntal). Then assume that main stress is added 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 that constraint. What options do we have for applying that rule?

5. The perfect grid—describing four basic stress systems
Prince proposes that the four basic stress types of Hayes (1981) can be achieved through setting two parameters for lining up syllables with a perfect grid:

\[
\begin{array}{ccccccc}
\text{x} & \text{x} & \text{x} \\
\ldots & \text{x} & \text{x} & \text{x} & \text{x} & \text{x} & \text{x} & \ldots \\
\end{array}
\]

(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)?

Maranungku (data originally from Tryon 1970)
Australian language from Australia with 15 to 20 speakers in 1983.

- tfí.ralk ‘saliva’
- mè.re.pèt ‘beard’
- yán.gar.mà.ta ‘the Pleiades’
- lángkaràtetì ‘prawn’
- wélepènemànta ‘kind of duck’
Weri (data originally from Boxwell & Boxwell 1966)
Trans-New Guinea language from Papua New Guinea with 4,163 speakers.

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

Warao (data originally from Osborn 1966)
Language isolate from Venezuela, Guyana, and Suriname with 18,000 speakers.

yi.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’

Araucanian (data originally from Echeveria and Contreras 1965)
Family consisting of two languages, Mapudunun from Chile and Argentina with 440,000 speakers, and Huilliche from Chile with several thousand speakers.

wu.lé ‘tomorrow’
ji.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 an extra grid mark at either the beginning or the end of the word.

Which setting does each of the four languages above have?

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

6. Extrametricality

In order to analyze some languages’ stress systems, it is necessary to suppose that certain material at the beginnings or ends (usually ends) of words is ‘left out’ of the grid-mark assignment (extrametrical).

Hayes (1981) proposes that only constituents (segments, syllables, feet [which we’ll get to later], phonological words, or affixes) may be made extrametrical.

Example: Winnebago/Hočąk (data originally from Miner 1979, Hale & White Eagle 1980). Siouan language from Wisconsin, with a settlement in Nebraska; about 885 speakers total? (All the hooks under vowels—which indicate nasalization—should be going the other way.)
What are the parameter settings for Winnebago, and what has to be extrametrical?

- ha.ki.rú.jik.šà.nà ‘he pulls it taut’
- hi.ra.wá.haz.rà ‘the license’
- ho.ki.wá.ro.kè ‘swing’
- ho.čì.čì.nìk ‘boy’
- hi.jo.wí.re ‘fall in’
- hi.pi.rák ‘belt’
- hiš.ja.sú ‘eye’

How are these forms different? Any ideas about why?

- wa.jé ‘dress’
- wi.júk ‘cat’

Most languages require every content word to have a stress. When a word is otherwise unstressable, a special rule steps in.

Let’s try to formulate Winnebago’s rule for otherwise unstressable words.

7. Moras

In order to look at the next example, we need to introduce the *mora*, a unit of weight (abbreviated μ). Weight is sort of an abstract version of duration. In most languages, short vowels have one mora and long vowels have two. In many languages, some or all coda consonants also get one.

8. Exercise: Cairene Arabic (data taken from Hayes 1994 and elsewhere)

(the variety of Egyptian Arabic spoken in Cairo—I believe these data represent a Classical style)

Building the grid on moras rather than syllables, figure out the parameter settings for Cairene and what has to be extrametrical. You can assume that secondary stressed gets assigned and then wiped out by a later rule.

First make a guess based on (a-f).

- a. ká.ta.ba ‘he wrote’
- b. ka.ta.bí.tu ‘she wrote it’
- c. ša.ja.rá.tu.hu ‘his tree’
- d. ff.him ‘he understood’
- e. ša.ja.rá.tun ‘tree’
- f. ša.ja.ra.tu.hú.maa ‘their (dual) tree’
Modify this guess to take care of (g-i), if necessary.

\[ \begin{align*}
g & \quad \text{ad.wi.ya.tú.hu} \quad \text{‘his drugs’} \\
h & \quad \text{in.ká.sa.ra} \quad \text{‘it got broken’} \\
i & \quad \text{qat.tá.la} \quad \text{‘he killed’}
\end{align*} \]

Any ideas about how to deal with (j-l)?

\[ \begin{align*}
j & \quad \text{ka.táb.ta} \quad \text{‘you (m.sg.) wrote’} \\
k & \quad \text{mu.dár.ris} \quad \text{‘teacher’} \\
l & \quad \text{haa.óá.ai} \quad \text{‘these (m. dual)’}
\end{align*} \]

There is actually more to it—this is just a fragment.

9. Exercise: Italian

Treat the following words as representing the basic primary-stress pattern of Italian. What are the parameter settings?

\[ \begin{align*}
a & \quad \text{mé.se} \quad \text{‘month’} \\
b & \quad \text{ká.sa} \quad \text{‘house’} \\
c & \quad \text{fjá.to} \quad \text{‘breath’} \\
d & \quad \text{tér.ra} \quad \text{‘earth’} \\
e & \quad \text{džór.no} \quad \text{‘day’} \\
f & \quad \text{di.ví.sa} \quad \text{‘uniform’} \\
g & \quad \text{tri.bú.na} \quad \text{‘rostrum’} \\
h & \quad \text{kom.prá.re} \quad \text{‘buy’} \\
i & \quad \text{kor.ní.tše} \quad \text{‘corniche’} \\
j & \quad \text{me.ta.fó.ní.a} \quad \text{‘metaphony’}
\end{align*} \]

Here are some words with a different stress pattern. There is no other systematic difference between these words and the basic words in (a), so something has to be different about their underlying representations. Ideas for what it could be?

\[ \begin{align*}
k & \quad \text{ká.li.tše} \quad \text{‘chalice’} \\
l & \quad \text{mú.sí.ka} \quad \text{‘music’}
\end{align*} \]

What extra stipulation do we need to make to take care of these words?

\[ \begin{align*}
m & \quad \text{ál.be.ro} \quad \text{‘poplar’} \\
n & \quad \text{fís.si.le} \quad \text{‘fissionable’}
\end{align*} \]
Some word shapes, however, never show antepenultimate stress. This should follow from the analysis so far:

- spa.gét.ti ‘spaghetti’
- a.rán.tʃo ‘orange (color)’
- am.búr.go ‘hamburger’
- in.tén.to ‘intent’
- *á.bur.go
- *ín.men.to

In addition, there are no words with preantepenultimate stress: *dó.bi.ta.pi. Does that follow from the analysis so far?

There are some words with final stress. What could we say about their underlying representations? (Note: final vowels in Italian are never long on the surface: *par.ló:, *pár.lo; certain other vowels are long, though I haven’t marked them.)

- ko.li.brí ‘hummingbird’
- dʒo.ve.dí ‘Thursday’
- u.ni.ver.si.tá ‘university’
- li.ber.tá ‘liberty’
- dʒo.ven.tú ‘youth’
- ko.sí ‘thus’
- tʃit.tá ‘city’
- per.ké ‘why’

There is a famous exception to the stress pattern laid out above, [mán dor.la] ‘almond’ (and a small number of other words like it: [pó lit.ʃa] ‘policy’, [á ris.ta] ‘pork loin’). We would like to account for these few words without opening the door to completely free stress placement. Please speculate on how these words’ underlying representation might look.