Class 1: Structure above the segment I

Overview
Arguments for including things like skeletons, moras, syllables, grids, feet, and prosodic words in phonological representations. Today: syllables and grids.

1 Representations in SPE

- Sequence of feature matrices:

\[
\begin{array}{c}
\text{[segmental]} \\
\text{+WB} \\
\text{–FB}
\end{array}
\begin{array}{c}
\text{[+seg]}
\text{+cons}
\text{+dors}
\text{–voice}
\text{–nas}
\text{–son}
\end{array}
\begin{array}{c}
\text{[seg]}
\text{–cons}
\text{–dors}
\text{+hi}
\text{+low}
\text{–back}
\text{–round}
\end{array}
\begin{array}{c}
\text{[+seg]}
\text{+cons}
\text{+cor}
\text{–voice}
\text{–nas}
\text{–son}
\end{array}
\begin{array}{c}
\text{[–seg]}
\text{+WB}
\text{–FB}
\end{array}
\]

2 Representations with syllables and syllable-internal structure

3 SPE rejected syllables, but they started to come back into style afterwards. Reasons?

3.1 They can explain basic C/V phonotactics well.

- Yawelmani Yokuts (Kisseberth 1970, Penutian, California) seems to require a constraint

\[
\begin{array}{c}
\ast \{\#\} C \{\#\}
\end{array}
\]

❔ How could we rephrase this if the theory includes syllables?
3.2 They can explain finer-grained phonotactics too
(see Steriade 1999 for classic references, including Steriade herself in the 1980s)

- Certain contrasts are licensed only in onsets (place, voicing [you saw a couple examples of this last quarter]...)
- Sonority tends to rise within an onset, fall within a coda

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g ʌ l f
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d ɹ i m
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3.3 But...

- Steriade 1999 argues that these phenomena are better explained in a way that sticks closer to the phonetics:
  - Yokuts: all consonants must be V-adjacent
  - Contrast licensing: __V is a better place for certain contrasts (place, voicing)
    - place cues from release burst, outgoing formant transitions...
    - (I’ll refer you to Steriade for the sonority-contour material.)

- And, Steriade argues, sometimes syllables make the wrong prediction.
  - Retroflex consonants’ place is best cued in the transition from the preceding V, not the transition to the following V.
    - There are languages where a retroflex is allowed only in a coda!

4 Syllable boundaries: caution

- It’s not always clear where the boundaries between syllables are (gi.ven? giv.en? giv.ven?)
  - Steriadean perspective: when you ask someone to separate a word into syllables, they’re trying to utter a sequence of legal words
    - [qi] is no good because it ends in a lax vowel (illegal in English)
    - giv. en is strange because it leaves the second syllable onsetless
    - giv.ven is strange because it repeats the [v]
      → no option seems quite right

- 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 [ʝ])
    - 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 [kópja-hín] ~ [kópj-a-hín] (only roots with stressed, closed penult show this pattern)
    - consistent with observing lots of words that end in [p]
5 What is stress? (17)

- 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.

6 Reasons not to treat stress as a feature

- It 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. áeligêjrə

- Other features (usually) don’t shift from segment to segment based on distance from a word edge:
  - origin
  - original
  - originality
  - photógraphe
  - photógrapher
  - photográfique

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

- 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 anyway).

- 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.
7 Reasons to handle stress with a metrical grid

- The prominence relation of stress 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).
    \[
    \begin{array}{cccc}
    x & x \\
    x & x \\
    x & x & x & x & x & x
    \end{array}
    \]
    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.

8 Payoffs of using the grid

8.1 Locality

- English phrasal stress rule (a.k.a. nuclear stress rule): place main stress on last word of phrase\(^2\)
  - But sometimes main stress ends up several syllables from the end of the phrase—makes for an awkward rule
  - Example from Hayes: hypothetical imitators, which could also perhaps be hypothetical imitators.

- Grid version of the rule is local:
  \[
  \begin{array}{c}
  x \\
  x
  \end{array}
  \rightarrow
  \begin{array}{c}
  x
  \end{array}
  \]
  = “if the top layer of the grid has exactly two marks, add another mark to the second one”

- 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

⚠️ Draw grids for hypothétique and imitators in isolation; put them together and apply this rule.

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\(^2\) 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.

\[
\text{NoCLASH:} \quad * \ x \ x \quad (\text{if two grid marks are adjacent on their layer, the grid marks under} \\
\quad \ x \ x \quad \text{them can’t also be adjacent on their layer})
\]

\[
\text{Move-X:} \quad \text{Move one grid mark along its layer (triggered by No-CLASH)}
\]

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

❓ Draw the grids for *Mississippi* and *législâtors*. 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?

### 8.2 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 *Súnsèt Párk* and *Zóo*, and then put them together and apply Move-\(x\) to resolve/alleviate the clash. Where can the moved \(x\) land?
Let’s use the rhythm rule to figure out grids for tôtàlitárian téndencies (more than one possible outcome?) and Còstàntinóple tráins

8.3 The poor get poorer (Hayes):
- Consider the derivation of paréntal from párent. When –al is added, assume that stress rules add stress to the new penult (páréntal). Then main stress is assigned (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 maybe only within a single word, not a compound or phrase?). What options do we have for applying that rule?

To sum up
- We’ve seen reasons to group segments into syllables, along with some cautions and skepticisms
- We’ve seen some advantages of representing stress as relative prominence relations

Next time
- If time: using the perfect grid to describe stress systems
- Adding feet to the structure
References (something seems to have gone wrong here—bunch of extra references I can’t get rid of)
Liberman, Mark. 1975. The Intonational System of English. MIT.