More on syllabification

- **Maximal Onset Principle** (Very informal definition)
  During syllabification try to maximize the onset as long as you don’t violate the phonotactics of the language.
Syllables and Phonological Derivations

- Rules of syllabification are **persistent**. Underlying phonological representations are syllabified by the syllabification rule, and when the phonological rules apply, the syllabification rule reapplies if possible.

A word from Tonkawa
Syllables and Phonological Derivations

- A rule in Tonkawa:

  \[ V \rightarrow \emptyset / \text{word} \ CVC \_\text{CV} \]

  ![Diagram of Tonkawa Syncope and Coda Formation]

  - Syncope
  - Coda Formation
Syllables and Phonological Derivations

- A rule in Tonkawa:

\[ V \rightarrow \emptyset / _{\text{word}} \text{CVC } \underline{\text{CV}} \]

\[ \sigma \]
\[ n \ o \ t \ o \ x \ o \ n \ o \ ? \]  
Coda Formation

\[ \sigma \]
\[ n \ o \ t \ x \ o \ n \ o \ ? \]  
Syncope

\[ \sigma \]
\[ n \ o \ t \ x \ o \ n \ o \ ? \]  
\(\sigma\) Assignment (persistent)

\[ \sigma \]
\[ n \ o \ t \ x \ o \ n \ o \ ? \]  
Coda Formation (persistent)
Rules of syllabification are **persistent**. Underlying phonological representations are syllabified by the syllabification rule, and when the phonological rules apply, the syllabification rule reapplies if possible.
**Practice Problem – Mohawk vowel length**

Mohawk long vowels:

<table>
<thead>
<tr>
<th>Mohawk Long Vowel</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>ranahé:zãs</td>
<td>‘he trusts her’</td>
</tr>
<tr>
<td>í:geks</td>
<td>‘I eat it’</td>
</tr>
<tr>
<td>jokékhaʔ</td>
<td>‘it’s burning’</td>
</tr>
<tr>
<td>ñsgãs</td>
<td>‘you (sg) see her’</td>
</tr>
<tr>
<td>awerjáhsa</td>
<td>‘heart’</td>
</tr>
<tr>
<td>wísk</td>
<td>‘five’</td>
</tr>
<tr>
<td>raj′ãthos</td>
<td>‘he plants’</td>
</tr>
<tr>
<td>ñgá:radeʔ</td>
<td>‘I lay myself down’</td>
</tr>
<tr>
<td>sdú:ha</td>
<td>‘a little bit’</td>
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<td>ragé:das</td>
<td>‘he scrapes’</td>
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<tr>
<td>oú:we</td>
<td>‘flea’</td>
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<tr>
<td>ñgídjeʔ</td>
<td>‘I will fly around’</td>
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<tr>
<td>gatgáhthos</td>
<td>‘I look at it’</td>
</tr>
<tr>
<td>jágwaks</td>
<td>‘they and I eat it’</td>
</tr>
<tr>
<td>rojó?de?</td>
<td>‘he works’</td>
</tr>
<tr>
<td>jégreks</td>
<td>‘I push it’</td>
</tr>
<tr>
<td>d′ã:gehgweʔ</td>
<td>‘I’ll lift it’</td>
</tr>
<tr>
<td>aplám</td>
<td>‘Abram’</td>
</tr>
<tr>
<td>ñk hní:nuʔ</td>
<td>‘I will buy it’</td>
</tr>
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Vowel length (V:) is not contrastive in Mohawk. In what contexts are vowels lengthened?
## Practice Problem – Mohawk vowel length

Mohawk long vowels:

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</table>

‘he trusts her’     ‘it’s burning’               
‘I eat it’           ‘you (sg) see her’          
‘he scrapes’         ‘I will fly around’         
‘flea’               ‘I look at it’               
‘I’ll lift it’        ‘they and I eat it’          
‘I will buy it’       ‘he works’                 
‘I talk’             ‘I push it’                
‘I lay myself down’   ‘heart’                   
‘a little bit’        ‘Abram’                   

Only stressed vowels are lengthened. **Are all stressed vowels long?**
### Practice Problem – Mohawk vowel length

#### Mohawk long vowels:

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Stressed vowels are not lengthened when they are followed by more than one C.
Practice Problem – Mohawk vowel length

- Stressed vowels are lengthened when they are followed by a CV sequence.

\[[\text{+syllabic}, \text{+stress}] \rightarrow [\text{+long}] / \underline{\text{CV}}.\]

1. Is it really necessary to look at two following segments at the same time?
2. Can you simplify the rule by referring to syllables?

Use the algorithm that we learned for syllabification and draw syllable structures for representative samples.
Draw internal syllable structure for ‘he trusts her’, ‘I eat it’, ‘it’s burning’ and ‘you see her’. What are the similarities and differences?
Practice Problem – Mohawk vowel length

- Stressed vowels are lengthened when they are in open syllables.

\[ [+\text{syllabic}, +\text{stress}] \rightarrow [+\text{long}] / \_\_ \] open \( \sigma \)

1. A syllable is open when it ends in a vowel (V. or CV.)
2. By referring to the syllables we avoid looking at two following segments. There’s no look ahead involved – syllable boundary is local.
Importance of *syllable* in Phonology

- Syllable is relevant to the description of some phonological rules.
- Syllable forms basis for describing stress patterns in languages.
Stress

- Stress is a property of syllables.
- We can define it as a relative prominence, i.e., one syllable is more prominent than all the other syllables in the word.

| appéndix | horýzon | câñema |

- Stress can be phonemic (free stress), which means it cannot be predicted; there are minimal and near-minimal pairs. For example, Spanish ['saβana] ‘bedsheet’ vs. [saβana] ‘savanna’.

- Stress is predictable when it's not phonemic (fixed stress).
Predicting Stress (Polish)

[tele'vizor]  ‘TV’
[televi'zor-ek]  ‘little TV’
[televizo'r-etf-ek]  ‘tiny little TV’  \( (k \rightarrow tʃ / \_\_ e) \)

Penultimate Stress (vowel-counting version)
\[ V \rightarrow [+stress] / \_\_ C_0 V C_0 \]_{\text{word}}

Assign stress to the second-to-last vowel in the word.

Penultimate Stress (syllabic version; preliminary)
\[ \sigma \rightarrow [+stress] / \_\_ \sigma \]_{\text{word}}

Assign stress to the second to last syllable in the word.
Predicting Stress (Polish)

Derivation:

\[
\begin{align*}
[t\;e\;l\;e\;v\;i\;z\;o\;r]\;_{\text{word}} & \quad \text{underlying form} \\
\begin{bmatrix}
\sigma & -\text{str} & \sigma & -\text{str} & \sigma & -\text{str} \\
\sigma & -\text{str} & \sigma & -\text{str} & \sigma & -\text{str}
\end{bmatrix} \\
\begin{array}{c}
\sigma \\
\sigma
\end{array}
\end{align*}
\]

\[
[t\;e\;l\;e\;v\;i\;z\;o\;r]\;_{\text{word}} \quad \text{syllabification, with assignment of } [-\text{stress}] \\
\begin{array}{c}
\sigma \\
\sigma
\end{array}
\]

\[
\begin{align*}
\sigma \rightarrow [+\text{stress}] & \quad / \\
\begin{bmatrix}
\sigma & -\text{str} & \sigma & +\text{str} & \sigma & -\text{str} \\
\sigma & -\text{str} & \sigma & +\text{str} & \sigma & -\text{str}
\end{bmatrix} \\
\begin{array}{c}
\sigma \\
\sigma
\end{array}
\end{align*}
\]

\[
[t\;e\;l\;e\;v\;i\;z\;o\;r]\;_{\text{word}} \quad \text{Penultimate Stress}
\]
More data:

['sen']  'dream'
['stax']  'Stan' (dimin. of Stanislaw)

Polish Stress (final version)
\[ \sigma \to [+\text{stress}] / \_\_ (\sigma) \text{ }\text{word} \]

Polish Stress: Expansions
\[
\begin{align*}
\sigma & \to [+\text{stress}] / \_\_ \sigma \text{ }\text{word} \\
\sigma & \to [+\text{stress}] / \_\_ \text{ }\text{word}
\end{align*}
\]
Conventions on Application of Stress Rules Containing Parentheses

a. *Longest first*
   If a stress rule includes an expression in parentheses, the longest expansions must be tried first.

b. *Blockage*
   When a stress rule is applied under some expansion, all remaining expansions are skipped.

c. *Completeness*
   If a stress rule cannot apply in a longer expansion, then the longest available remaining expansion must be tried next.
Application of stress rules (Polish)

longer expansion: \( \sigma \rightarrow [\text{+stress}] / \_ \_ \sigma \)_word

shorter expansion: \( \sigma \rightarrow [\text{+stress}] / \_ \_ \)_word
Practice Problem (Macedonian)

Three syllables and up
['beseda]  ‘lecture’
[vo'denitsar]  ‘miller’
[be'sedata]  ‘the lecture’
[vode'nitsari]  ‘millers’
[vodenit'sarite]  ‘the millers’

Two syllables
['zena]  ‘woman’
['vide]  ‘sees’

One syllable
['den]  ‘day’
['rid]  ‘hill’

Macedonian Stress
\( \sigma \rightarrow [+\text{stress}] / \_ (\sigma \_\sigma) \_\text{word} \)
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- Syllable is relevant to the description of some phonological rules.
- Syllable forms basis for describing stress patterns in languages.