Class 7 (Feb. 27): Lexical Phonology I

Overview
- Lexical vs. postlexical rules
- The cycle

Observation: two types of rule

*English “trisyllabic shortening”*

<table>
<thead>
<tr>
<th></th>
<th>trisyllabic shortening</th>
<th>flapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensitive to morphology?</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>creates new allomorphs?</td>
<td>no (&quot;structure preserving&quot;)</td>
<td>yes</td>
</tr>
<tr>
<td>phonetically motivated?</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>obvious to untrained listener?</td>
<td>yes</td>
<td>not always</td>
</tr>
<tr>
<td>exceptions?</td>
<td>yes (ob[i]sity)</td>
<td>no</td>
</tr>
<tr>
<td>applies across word boundaries?</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>
Explaining these properties with lexical phonology

Trisyllabic shortening is regarded as lexical, flapping as postlexical.

*Morphological sensitivity*
Once a rule goes to the postlexical phonology, all morphological labels are removed (“bracket erasure”)—so flapping can’t see them.

*Structure preservation*
Because the result of applying a lexical rule has to be a legitimate lexical entry, it can’t contain anything that doesn’t belong to the “phoneme inventory”.

*Exceptions*
Lexical rules can “see” the lexical entry to check if it has any information about being an exception.

*Intuitions*
When making judgments about whether sounds are the same or different, perhaps speakers look at a lexical entry.

*Word boundaries*
Because lexical rules apply within the lexicon (output is a lexical entry), they can’t “see” other words in the environment.

This model makes strong predictions about ordering: all postlexical rules must follow all lexical rules.
**Observation: carry-over from the stem**

*English stress*

\[ \text{còm.p[\varepsilon]n.sà.tion} \quad \text{*còm.p[\varepsilon]n.sà.tion} \quad \text{còm.pen.sate} \]
\[ \text{còn.d[\varepsilon]n.sà.tion} \quad \text{còn.d[\varepsilon]n.sà.tion} \quad \text{con.dénse} \]

The [\varepsilon] is optionally preserved in *condensation* because of the stress in *condense*.

\[ \text{Wi.nne.pe.sáu.kee} \quad \text{o.rì.gi.ná.li.ty} \quad \text{ó.ri.gin} \]

Secondary stress is in the “wrong” place in *originality* because of the stress in *origin*.

**Observation: multiple rule application**

Catalan (Indo-European, 4,353,000 speakers in Spain, France, Andorra, USA, Italy) (Mascaró)

Nasal place assimilation: \([+\text{nasal}] \rightarrow [\alpha]\text{place} / \_ [\alpha]\text{place}]\]

Postnasal stop deletion: \([-\text{cont}] \rightarrow \_ / [+\text{nasal}] \_ \#\]

<table>
<thead>
<tr>
<th>/bint+\varepsilon/</th>
<th>/bint/</th>
<th>/bint pans/</th>
<th>/bint kaps/</th>
<th>/\varepsilon n/</th>
<th>/\varepsilon n+k/</th>
</tr>
</thead>
<tbody>
<tr>
<td>assim.</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>deletion</td>
<td>---</td>
<td>bin</td>
<td>bin pans</td>
<td>bin kaps</td>
<td>---</td>
</tr>
<tr>
<td>assim.</td>
<td>---</td>
<td>bin pans</td>
<td>bin kaps</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

‘twentieth’ ‘twenty’ ‘twenty breads’ ‘twenty heads’

‘sell-3s’ ‘sell-1s’

Assimilation has to follow deletion for the ‘twenty’ cases, but has to precede deletion for the ‘sell’ cases.

**Proposal: cyclicity**

Apply the rules to the root, and each time you add a morpheme within the lexical component, apply them again:

<table>
<thead>
<tr>
<th>/bint kaps/</th>
<th>/\varepsilon n+k/</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st cycle (root only)</td>
<td>assim. --- --- bin ---</td>
</tr>
<tr>
<td>add a morpheme</td>
<td>bin kaps</td>
</tr>
<tr>
<td>2nd cycle</td>
<td>assim. bi\varepsilon n kaps be\varepsilon n</td>
</tr>
<tr>
<td>deletion</td>
<td>--- be\varepsilon n</td>
</tr>
</tbody>
</table>

\[ [\text{bí\varepsilon n kaps}] [\text{\varepsilon n}] \quad \text{‘twenty heads’} \quad \text{‘sell-1s’} \]
• This explains how a rule can apply both before and after another rule.

• It can also explain why phonology of the stem can carry over into the affixed form: the rule that assigns stress to originality starts from a word that already has stress (original).

Interleaving morphology and phonology is good because unlike in earlier models, it allows morphology to depend on phonology (which happens):

*English deverbal -al
Can attach only to final-stressed stems
  [acquist]al
  [rebú]al
  *[dévelop]al

*Preview of next time (more lexical phonology)
  • Talk about final project
  • Strict Cycle Condition
  • Levels

*To do for next time

*Problems
Serbo-Croatian (turn in Monday, Mar. 4th)
Class 7 (Feb. 27): Lexical Phonology II

Overview
• Strict Cycle Condition
• Levels

Observation: derived environments

The straightforward way of being sensitive to morphology is to apply only at morpheme boundaries:

Finnish (Uralic language with 6,000,000 speakers, mainly in Finland and Sweden)
\[ t \rightarrow s / __ \]

\[ \text{halut-a} \quad \text{‘to want’} \quad \text{halus-i} \quad \text{‘wanted’} \]

\[ \text{but} \]
\[ \text{tila} \quad \text{‘room’} \]
\[ \text{æiti} \quad \text{‘mother’} \]

We can easily capture this by referring to a morpheme boundary in the rule:

\[ t \rightarrow s / __ + i \]

Another rule of Finnish:
\[ e \rightarrow i / __ \# \]

\[ \text{joke-na} \quad \text{‘river’} \quad \text{essive sg.} \quad \text{joki} \quad \text{‘river’} \quad \text{nom. sg.} \]
\[ \text{æiti-næ} \quad \text{‘mother’} \quad \text{essive sg.} \quad \text{æiti} \quad \text{‘mother’} \quad \text{nom. sg.} \]
\[ \text{and} \]
\[ \text{vete-næ} \quad \text{‘water’} \quad \text{essive sg.} \quad \text{vesi} \quad \text{‘water’} \quad \text{nom. sg.} \]
\[ \text{kæte-næ} \quad \text{‘hand’} \quad \text{essive sg.} \quad \text{kæsi} \quad \text{‘hand’} \quad \text{nom. sg.} \]

\[ e \rightarrow i \text{ feeds } t \rightarrow s \]
\[ \text{vesi and } \text{kæsi} \text{ evidently count as “derived environments” for the } t \rightarrow \text{ rule.} \]
But we can’t rewrite the rule to reflect that in a simple way.

Sanskrit ruki (Indo-European language, used as a literary and liturgical language in India)
\[ s \rightarrow š / \{r, u, k, i\} \]

\[ \text{da-da:-si} \quad \text{‘you give’} \quad \text{bi-bhar-ši} \quad \text{‘you carry’} \]
\[ \text{kram-sja-ti} \quad \text{‘he will go’} \quad \text{vak-šja-ti} \quad \text{‘he will say’} \]
but
bisa  ‘lotus’
busa  ‘mist’
barsa  ‘tip’

Some other Sanskrit rules feed ruki:
ablaut
sa:sa  ‘instruct’  siṣ-ta  participle

vowel deletion

So ablaut and vowel deletion also count as derived environments.

**Proposal: the Strict Cycle Condition**

*Catalan again*

- devocalization: unstressed i, u → j, w / V __
- destressing: V → [-stress] / __ ... [+stress]
- vowel reduction: o → u / unstressed

Destressing counterfeeds devocalization

<table>
<thead>
<tr>
<th></th>
<th>/rűṅ+ős/</th>
<th>/a+óbr+iɾ/</th>
<th>/rűṅ+ős+ižim/</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st cycle (root only)</td>
<td>devocalization</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>destressing</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>vowel reduction</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>cf. rűṅo</td>
<td>cf. óbrə</td>
<td>cf. rűṅə</td>
</tr>
<tr>
<td></td>
<td>‘ruin’</td>
<td>‘opens’</td>
<td>‘ruin’</td>
</tr>
<tr>
<td>add a morpheme</td>
<td>ruṅoś</td>
<td>óbrir</td>
<td>ruṅoś</td>
</tr>
<tr>
<td>2nd cycle</td>
<td>devocalization</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>ruinős</td>
<td>obrir</td>
<td>ruinős</td>
</tr>
<tr>
<td></td>
<td>destressing</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>ruinős</td>
<td>ubrir</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>vowel reduction</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>cf. ubrir</td>
<td>‘to open’</td>
<td></td>
</tr>
<tr>
<td>add a morpheme</td>
<td>aubrir</td>
<td></td>
<td>ruinósizim</td>
</tr>
<tr>
<td>3rd cycle</td>
<td>devocalization</td>
<td>awbrir</td>
<td><strong>why not?</strong></td>
</tr>
<tr>
<td></td>
<td>ruinős</td>
<td>---</td>
<td>ruinósizim</td>
</tr>
<tr>
<td></td>
<td>destressing</td>
<td>---</td>
<td>ruinosizim</td>
</tr>
<tr>
<td></td>
<td>vowel reduction</td>
<td>---</td>
<td>ruinosizim</td>
</tr>
<tr>
<td></td>
<td>[ruinős]</td>
<td>[awbrir]</td>
<td>[ruinosizim]</td>
</tr>
<tr>
<td></td>
<td>‘ruinous’</td>
<td>‘in order to open’</td>
<td>‘very ruinous’</td>
</tr>
</tbody>
</table>
Destressing counterfeeds devocalization—it can only apply if a vowel is destressed in one cycle and then devocalized in the next.

OK, but why no devocalization in [ruinosízim]?

**Strict Cycle Condition**
A cyclic rule can apply only when
- the rule refers crucially to info that spans the (morpheme) boundary between the previous cycle and the current one
- the rule crucially refers to information supplied by a rule operating on the current cycle

In other words, if the cycle ends and the rule hasn’t applied, it doesn’t get to apply in a later cycle unless something changes in the representation.

This explains why cyclic rules apply only in derived environments (the SCC can never be satisfied within the root).

**Finnish /vete/ works IF we assume that adding the word boundary is a step in the morphological derivation**

<table>
<thead>
<tr>
<th>Finnish</th>
<th>/tila/</th>
<th>/vete/</th>
<th>/halut+i/</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st cycle (root only)</td>
<td>raising</td>
<td>---</td>
<td>--- (SCC)</td>
</tr>
<tr>
<td>t → s</td>
<td>--- (SCC)</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>add a morpheme</td>
<td>---#</td>
<td>---#</td>
<td>haluti</td>
</tr>
<tr>
<td>2nd cycle</td>
<td>raising</td>
<td>---</td>
<td>veti</td>
</tr>
<tr>
<td>t → s</td>
<td>--- (SCC)</td>
<td>vesi</td>
<td>halusi</td>
</tr>
<tr>
<td>add a morpheme</td>
<td>---</td>
<td>---</td>
<td>halusi#</td>
</tr>
<tr>
<td>3rd cycle</td>
<td>raising</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>t → s</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>
Proposal: levels

Two classes of affix in English

<table>
<thead>
<tr>
<th>suffix examples</th>
<th>-al, -ous, -th, -ate, -ity, -ic</th>
<th>-ship, -less, -ness, -er, -ly, -ful, -some</th>
</tr>
</thead>
<tbody>
<tr>
<td>stress shift?</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>trisyllabic shortening</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>prefix examples</th>
<th>in-, sub-,</th>
<th>un-, non-</th>
</tr>
</thead>
<tbody>
<tr>
<td>count for stress?</td>
<td>can</td>
<td>no</td>
</tr>
<tr>
<td>place assimilation?</td>
<td>yes</td>
<td>no/limited</td>
</tr>
</tbody>
</table>

| attach to bound morphemes? | yes | no (only to words |
| ordering | inner | outer |
| semantics | opaque | transparent |

The lexical component is broken down into levels, with different rules applying at different levels.

Level 1: primary inflection (tooth/teeth), primary derivational affixes (-al, -ous)
    rules: stress, trisyllabic shortening

Level 2: secondary derivation (-ness, -er), compounding (blackbird)
    rules: compound stress

Level 3: secondary inflection (-s, -ed)
    rules: ?

Postlexical rules: aspiration, flapping

The output of each level must be a full-fledged lexical item. This explains why Level 2 affixes can’t attach to bound roots: if a bound root makes it out of Level 1 without having received any affixes, it’s not an acceptable lexical item.

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1 There are probably two re-s, one belonging to the first column and having variable and uncertain meaning, the other belonging to the second column and always meaning ‘do the action again’. Similarly, there seem to be two de-s, with the column-one one having uncertain meaning and the column-two one always meaning ‘reverse the action of’.
A word has to pass through all the rule boxes even if it didn’t attach anything in the morphology box.

Why do Level 1 rules apply both before and after Level 1 affixation? (vacuous if rule is blocked by SCC)

Because some Level 1 affixes depend on phonological information (e.g. –al requires last syll to be stressed).
Example: Spanish palatals
In European Spanish, certain palatal and alveolar consonants contrast:

kana 'grey hair'  polo 'pole'

kaña 'cane'  poño 'chicken'

But the palatal consonants must be prevocalic (__V):

dezóñ-ar 'to disdain'  donseñ-a 'maiden'
dezóñoso 'disdainful'  donseñ-s 'maidens'

dezóñen 'disdain (N)'  donsels 'swain'

but:  but:
dezóñen-es 'disdain (N, plural)'  donsels-es 'swains'

So is the “de-palatalization” rule lexical or postlexical?

Example: Spanish n-velarization and s-aspiration
(found only in certain dialects)

When not prevocalic, /n/ → [ŋ], /s/ → [h]:

kaññar 'they sing'  deññen 'disdain'

There are no /ŋ/ or /h/ phonemes in these dialects.

Should these rules be lexical or post-lexical?

Observe:

/mes/ [meh] 'month'  /pan/ [pan] 'bread'
/mes-es/ [mes-eh] 'months'  /pan-es/ [pan-eh] 'breads'

Preview of next time
• Tone

To do for next time
Read
• Gussenhoven & Jacobs ch. 9
• Ladefoged ch. 10

Problems
• Finish Serb-Croatian (turn in Monday, Mar. 4th)