BBN–ANG–242 Phonology

9. n and ň;
allophonic rules and alternations:
aspiration, L-darkening and flapping

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I. η and η
n and ŋ in Hungarian

*inka* ‘Inca’  [iŋko]  *bingó* ‘bingo’  [biŋoː]
*tank* ‘tank’  [tɔŋk]  *rang* ‘rank’  [rɔŋ]

In Hungarian the velar nasal [ŋ] only occurs before velar consonants (/k/ and /g/), i.e. its occurrence is predictable:

Nasal Place Assimilation:

/\n/ → [ŋ] / —C\_velar

Which means that [ŋ] is an allophone of /\n/ and not a phoneme:

[ŋ]  [ŋ]  …
Inca [lnkə]  bingo [bิงəw]
tank [tánk]  rang [ránŋ]

Just like in Hungarian, the velar nasal occurs before velar consonants (/k/ and /g/) in English.

**BUT...**

Unlike in Hungarian, it occurs word-finally too, and we find minimal pairs like

ran /rán/ – rang /ránŋ/

Which means that in English /ŋ/ is a phoneme on its own ("once a phoneme, always a phoneme" principle):

/n/ – /ŋ/
II. Allophonic rules and alternations
Allophonic rules and alternations

underlying representation (UR) \( /kɪl/ \)

allophonic rules

surface representation (SR) \( [kʰɪɬ] \)
a. Aspiration
Aspiration
from a phonetic point of view

(1) pay /pɛj/ → [pʰɛj]
(2) pray /prɛj/ → [pɾɛj]

Aspiration is realized as either (1) a short [h] segment or (2) the devoicing of the sonorant following the aspirated segment: [l, ɾ, j, w].
Aspiration
from a *phonological* point of view

Two types of obstruents in English:

- **lenis** (underlyingly voiced):  b, d, g, dʒ, v, ð, z, ʒ
- **fortis** (underlyingly voiceless):  p, t, k, tʃ, f, θ, s, ʃ

*Fortis stops* have aspirated and unaspirated allophones:

```
<table>
<thead>
<tr>
<th>/p/</th>
<th>/t/</th>
<th>/k/</th>
</tr>
</thead>
<tbody>
<tr>
<td>[p]</td>
<td>[t]</td>
<td>[k]</td>
</tr>
<tr>
<td>[pʰ]</td>
<td>[tʰ]</td>
<td>[kʰ]</td>
</tr>
</tbody>
</table>
```
Aspiration from a *phonological* point of view

<table>
<thead>
<tr>
<th>Aspiration Level</th>
<th># (C)V</th>
<th>Aspirated</th>
<th># (C)V*</th>
</tr>
</thead>
<tbody>
<tr>
<td>strongly asp’ed</td>
<td># (C)V</td>
<td>[pʰ]íg</td>
<td>com[pʰ]áre</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]áralyze</td>
<td>occu[pʰ]átion</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]óison</td>
<td>a[pʰ]éar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]óud</td>
<td>com[pʰ]úter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]áy</td>
<td>a[pʰ]óve</td>
</tr>
<tr>
<td>weekly asp’ed</td>
<td># (C)V</td>
<td>[pʰ]aráde</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]olíte</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[pʰ]epáre</td>
<td></td>
</tr>
</tbody>
</table>

* C = /l, r, j, w/, i.e. approximants/non-nasal sonorants
Aspiration
from a *phonological* point of view

 unaspirated

<table>
<thead>
<tr>
<th>____C V*</th>
<th>____C ≠ /l, r, j, w/</th>
<th>____#</th>
<th>__<strong>s</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>há[p]y</td>
<td>hy[p]nosis</td>
<td>stam[p]</td>
<td>was[p]</td>
</tr>
<tr>
<td>Á[pr]il</td>
<td></td>
<td></td>
<td>s[pr]ay</td>
</tr>
</tbody>
</table>

* C = /l, r, j, w/, i.e. approximants/non-nasal sonorants
Aspiration
from a phonological point of view

So, the rule:

A fortis stop is aspirated if it is

a) word-initial

or  b) followed by (an approximant and) a stressed vowel.

*Note:* no aspiration after [s].
Aspiration
Pronunciation practice

cool
school
total
potato
pretty
Aspiration

Pronunciation practice

[kʰ]óol

s[k]óol

[tʰ]ó[t]al

[pʰ]o[tʰ]á[t]o

[pɾ]é[t]y
b. L-darkening
L-darkening
from a *phonetic* point of view

[ɪl]  [ɨl]

clear L  dark L

velarized
L-darkening from a *phonological* point of view

*L’s in Russian*

угол ‘corner, angle’ /úgəɭ/

vs.

уголь ‘coal’ /úɡəɬ/

/úɡəɭ/ and /úɡəɬ/ form a minimal pair, /ɭ/ and /ɬ/ are different phonemes in Russian
L-darkening from a phonological point of view

L’s in English

/\l/

[\l] [\l̩]

[\l] and [\l̩] are in complementary distribution in English, they are allophones of the same phoneme
L-darkening
from a *phonological* point of view

<table>
<thead>
<tr>
<th>dark L</th>
<th>clear L</th>
</tr>
</thead>
<tbody>
<tr>
<td>__</td>
<td></td>
</tr>
<tr>
<td>will</td>
<td>filter</td>
</tr>
<tr>
<td>tell</td>
<td>field</td>
</tr>
<tr>
<td>handful</td>
<td>gold</td>
</tr>
<tr>
<td>will go</td>
<td>tell me</td>
</tr>
<tr>
<td>all the</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
L-darkening from a *phonological* point of view

<table>
<thead>
<tr>
<th>dark L</th>
<th>clear L</th>
</tr>
</thead>
<tbody>
<tr>
<td>__‖</td>
<td>_(#)C ≠ j</td>
</tr>
<tr>
<td>will</td>
<td>filter</td>
</tr>
<tr>
<td>tell</td>
<td>field</td>
</tr>
<tr>
<td>handful</td>
<td>gold</td>
</tr>
<tr>
<td></td>
<td>will go</td>
</tr>
<tr>
<td></td>
<td>tell me</td>
</tr>
<tr>
<td></td>
<td>all the</td>
</tr>
<tr>
<td></td>
<td>live</td>
</tr>
<tr>
<td></td>
<td>London</td>
</tr>
<tr>
<td></td>
<td>legal</td>
</tr>
<tr>
<td></td>
<td>allow</td>
</tr>
<tr>
<td></td>
<td>below</td>
</tr>
<tr>
<td></td>
<td>tell us</td>
</tr>
</tbody>
</table>

L-darkening is a *post-lexical rule*, i.e. it applies across word boundaries as well.
L-darkening
from a *phonological* point of view

Plus, syllabic L’s are always dark:

apple \([\text{ápəl}] \sim [\text{ápɬ}]\)

e.g. \([\text{ápəl}] + [\text{ɪz}] \rightarrow [\text{ápɬɪz}]\)

\([\text{ápɬ}] + [\text{ɪz}] \rightarrow [\text{ápɬɪz}]\)
L-darkening
from a phonological point of view

And the rule:

\[ l \rightarrow l / \begin{cases} \text{when syllabic} \\
\end{cases} \]
Tell Allen a lie, but tell Bill the truth.

It was extremely cold in London in the middle of last July.

That girl will definitely call you.

I’m planning to play the violin if it’s possible.
L-darkening

Pronunciation practice


c. Flapping
Flapping
from a phonetic point of view

\[ \text[r] \]

the tongue rapidly flaps against the alveolar ridge, producing a one-tap \( r \); the airflow isn’t completely blocked as in the case of \[ \text{d} \]:

\textit{atom} [\text{árem}] (e.g. in GenAm, Irish and Australian English)

Hun. \textit{perem} ‘edge’ [\text{pɛɾɛm}]
Flapping from a *phonological* point of view

\[
\begin{align*}
\text{atom} & \quad /\acute{a}t\text{"om}/ \\
\text{Adam} & \quad /\acute{a}d\text{"om}/ \\
\end{align*}
\]

\[\rightarrow [\acute{a}r\text{"om}]\]

neutralization
Flapping
from a *phonological* point of view

<table>
<thead>
<tr>
<th>City</th>
<th>Atomic</th>
<th>Sister</th>
<th>Metric</th>
<th>Tom</th>
<th>Cat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Letter</td>
<td>Attack</td>
<td>After</td>
<td>Atlas</td>
<td>Take</td>
<td>Late</td>
</tr>
<tr>
<td>Later</td>
<td>Retain</td>
<td>Actor</td>
<td>Whitney</td>
<td>Tender</td>
<td>Cigarette</td>
</tr>
<tr>
<td>Ghetto</td>
<td>Detect</td>
<td>Alter</td>
<td>Atkins</td>
<td>Tomorrow</td>
<td>Best</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V₀_V</th>
<th>V₀_V</th>
<th>V_C</th>
<th>C_V</th>
<th>#</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flapping possible</td>
<td>no flapping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note 1:* Flapping is possible in the environments $Vn\_V^0$ and $Vr\_V^0$ (and $Vl\_V^0$) too, where a sonorant consonant precedes the /t, d/, e.g. sentence [sɛ̃rens] (nasalized flap), party [pάρη].

*Note 2:* /t, d/ can be flapped even if the following vowel is in the next word, in which case it doesn’t have to be unstressed, e.g. *eight elves* [éjr élvz].
Terms to check

allophonic rules and alternations (allofonikus szabályok és váltakozások)
vocal folds/cords (hangszalagok)
voiced(ess) (zőngés(ség)) vs. voiceless(ess) (zőngétlen(ség))
aspiration (aspiráció, hehezet)
lenis consonants (lenis/laza mássalhangzók)
  vs. fortis consonants (fortis/feszes mássalhangzók)
clear L vs. dark L (világos l vs. sötét l)
L-darkening (l-sötétedés)
flapping/tapping (lebbentés)
Recommended reading

• The phoneme η
  (http://seas3.elte.hu/phono/notes/141-C-system.html)

• Two types of obstruent
  (http://seas3.elte.hu/phono/notes/obstr.html)

• English phonology: Two types of l
  (http://seas3.elte.hu/phono/notes/el.html)

• T-Voicing and T/D-Flapping
  Ádám Nádasdy: Background to English Pronunciation, pp. 73–74