# BBN–ANG–243 Phonological Analysis #4
# STRESSED AND UNSTRESSED VOWELS

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http://seas.elte.hu/w/!analysis

# what is stress?

- stress is the prominence of some portion of the speech signal: **louder, higher pitched, longer**
- stress is **strength**
  - stressed vowels (and consonants before them) are more resistant to decay
  - there is more variability in (and before) stressed position
- stress prefers sonority to its absence (vowels to consonants, sonorants to obstruents, lower vowels to higher ones)
- stress prefers heavy to light syllables

# syllable weight

- **moraicity:**
  - a vowel is always moraic: `jes` (when it is not moraic, we call it a consonant: `jes`)
  - a consonant followed by a vowel is not moraic: `tʃes`
  - a consonant followed by another consonant is moraic: `dolfin`
    (with the exception of some obstruents followed by a sonorant: `teflon`)
  - a word-final consonant is not moraic in English: `jes`
- **light** syllables end in a short vowel ( `C*V` ): contain one mora(ic sound)
- **heavy** syllables end in a consonant or contain a long vowel ( `C*VC*` or `C*V:C*` ): contain more than one mora(ic sound) ( `C*` means any number of Cs, `C⁺` means one or more Cs)
- word-final consonants do not behave as 'syllable' final in English, the bracketed syllables are light: *gallop* `gá[lə]p`, *abandon* `əbán[də]n`, *cancel* `kán[sə]l`; but the following are heavy: *incense* `ín[sen]s`, *insult* `ín[səl]t`, *record* `ré[koː]d`

| first V in heavy syll: stressed | first V in light syll: unstressed | but with a Latinate prefix |
|---|---|---|
| *Montana* [món]tánə | *Managua* [mə]nágwə | *continue* [kən]tínjuw |
| *antenna* [án]ténə | *agenda* [ə]dʒéndə | *compare* [kəm]pé꞉ |
| *Bagdad* [bág]dád | *Badel* [bə]dél | *admire* [əd]májə |
| *Kaspersky* [kás]bá꞉sgij | *Zelensky* [zə]lénsgij | |
| *Manhattan* [mán]hátən | *Sahara* [sə]há꞉rə | |
| *torment* [tó꞉]mént | *lament* [lə]mént | |
| *Berlin* [bə́꞉]lín | *balloon* [bə]lúwn | |
| *martini* [má꞉]tíjnij | *graffiti* [grə]fíjtij | |

| last V in heavy syll: stressed | last V in light syll: unstressed | but with coronal clusters |
|---|---|---|
| *aspect* ás[beg]t | *aspen* ás[bə]n | *absent* áb[sən]t |
| *transept* trán[seb]t | *transom* trán[sə]m | *balance* bá[lən]s |
| *retard* ríj[taː]d | *dotard* dǽw[tə]d | *second* sé[kən]d |
| *Mycroft* máj[krof]d | *secret* síj[krə]t | *herald* hé[rəl]d |

# stress vs accent

| stress | accent |
| --- | --- |
| stable | mobile |
| phonologically/lexically determined | nonphonologically determined |
| influenced by vowel quality | influenced by stress |
| at least one per content word | maximally one per word |

# the Rhythm Rule

accent moves **left** before another accent (schematically: `sś → śs ś(w)`)

- *thirtéen* vs *thírteen mén*
- *Taiwán* vs *Táiwan súmmit*

but only if it finds a stressed vowel (`wś → wś ś(w)`)

- *retúrn* vs *retúrn tríp*
- *Madríd* vs *Madríd súmmit*

`s` = stressed, `ś` = accented, `w` = unstressed (weak)

# dictionary transcriptions

(British) dictionaries typically mark only the place of (potential) accent, not all stresses:

| word/phrase | pattern | trad. dict. (Gimson 1962) | simple transcription |
|---|---|---|---|
| *Slovak* | `śs` | `ˈsləʊvæk` | `sláwvak` |
| *Slovak jam* | `śs ś` | `ˌsləʊvæk ˈdʒæm` | `sláwvak dʒám` |
| *Japanese* | `swś` | `ˌdʒæpəˈniːz` | `dʒápəníjz` |
| *Japanese garden* | `śws św` | `ˌdʒæpəniːz ˈgɑːdən` | `dʒápənijz gáːdən` |
| *Chinese* | `sś` | `ˌtʃaɪˈniːz` | `tʃájníjz` |
| *Chinese restaurant* | `śs śs` | `ˌtʃaɪniːz ˈrestrɒnt` | `tʃájnijz résdront` |

# ‘degrees’ of stress

| example vowel | status | stress ‘degree’ | here |
|---|---|---|---|
| Slovak, Japanese, Chinese | full | primary | stressed, accented |
| Slovak jam, Japanese garden | full | secondary | stressed, accented |
| Japanese, Chinese | full | secondary | stressed, not accented |
| Slovak, Chinese restaurant | full | tertiary | stressed, never accented |
| Japanese, garden | reduced | zero | not stressed (not accented) |

‘tertiary’ stress is never accented because accent does not move to the right

# unstressed vowels in old-school accounts

## short (ə, ɪ)

- *Japanese* ˌdʒæpə'niːz (simple dʒápəníjz), *garden* 'gɑːdən (gáːdən)
- *panic* 'pænɪk (pánik), *village* 'vɪlɪdʒ (vílidʒ)

## variable (i, u)

- *happy* 'hæpi = ϯ-ɪ or -iː (hápij), *create* kri'eɪt = ϯ-ɪ- or -iː- (krijéjt)
- *volume* 'vɒljum = -ʊ- or -uː- (vóljum/véljuwm), *duet* dʒu'et = ϯ-ʊ- or -uː- (dʒuwét)

## long/diphthong (əʊ, uː)

- əʊ as in *motto* 'mɒtəʊ (mótəw), *obese* əʊ'biːs (əwbíjs)
- uː as in *value* 'væljuː (váljuw)

# HAPPY-tensing (*þápi > hápij)

- i > ij / _{#, V} (at the end of a word and before a vowel: hápij, krijéjt)
- if ij were a long vowel or a diphthong, this would be a very peculiar change:
  a short vowel becomes long (more prominent) **when unstressed**
- if ij is a short vowel + a glide, HAPPY-tensing is
  - hiatus filling: krijéjt
  - adding a consonant word finally where short vowels do not occur: hápij
- fun fact: the process is called ‘tensing’ because FLEECE ij is analysed as i (vs ɪ) in AmE

# the distribution of unstressed short vowels

| vowel | _C | _# | _V |
|---|---|---|---|
| i, u | ✓ | ✗ | ✗ |
| ə | ✓ | ✓ | ✗ |

- unstressed i only occurs before a **consonant** (due to HAPPY-tensing)
- (unstressed u historically comes from uw: w is lost before a consonant)
- there is no repair for unstressed ə# (r could be inserted, but this is a nonrhotic accent: *r#)

# the distribution of unstressed ‘diphthongs’

| | _C (glide is moraic) | _# (glide is not moraic) | _V (glide is not moraic) |
|---|---|---|---|
| ij | — | *valley* válij | *atrium* éjtrijəm |
| əw | *obey* əwbéj > əbéj | *yellow* jéləw | *Genoa* dʒénəwə |
| uw | *volume* véljuwm > véljum | *value* váljuw | *usual* júwʒuwəl |

- the offglides are obligatory word finally and before a vowel (where short vowels cannot occur and) where the offglide **is not moraic**
- the offglide may occur, but is often dropped before a consonant, where the offglide **is moraic**
- if these were diphthongs they would not occur or would be lost before a C, where **all** Vs occur

# the vowel inventory of BE (as argued for last week)

| ‘short’ | front | central | back | ‘long’ | front | central | back |
|---|---|---|---|---|---|---|---|
| **nonlow** | i | ə | u | **nonlow** | iː | əː | uː |
| **nonhigh** | e | a | o | **nonhigh** | eː | aː | oː |

- the highlighted vowels occur unstressed and stressed, the others only stressed
- of the ‘diphthongs’ ij, əw, and uw occur unstressed: further evidence that these are VC
- real long vowels never occur unstressed

# the sonority scale (as introduced last week)

<table>
<tr><td colspan="3">vowels</td><td colspan="4">consonants</td></tr>
<tr><td colspan="3">vowels</td><td colspan="3">sonorant Cs</td><td colspan="2">obstruents</td></tr>
<tr><td colspan="3">vowels</td><td>glides</td><td>liquids</td><td>nasals</td><td colspan="2">obstruents</td></tr>
<tr><td>low Vs</td><td>mid Vs</td><td colspan="2">high Vs/glides</td><td>liquids</td><td>nasals</td><td>fricatives</td><td>plosives</td></tr>
<tr><td>a</td><td>e o</td><td colspan="2">i/j u/w</td><td>r l</td><td>m n ŋ</td><td>f v s...</td><td>p b t...</td></tr>
<tr><td></td><td></td><td colspan="2"></td><td></td><td></td><td></td><td></td></tr>
</table>

# moraicity and sonority

| set | members | moraic |
|---|---|---|
| nonhigh/long vowels | eː aː oː iː əː uː e a o ə | ✓ |
| high Vs, most consonants | i/j u/w l r m n ŋ v ð z ʒ f θ s ʃ b d dʒ g p t tʃ k | % |
| other | h | ✗ |

- vowels are always moraic (except high vowels which are here equated with glides)
- most consonants are potentially moraic (depending on their position, as explained earlier)
- h, which only occurs before a vowel in modern English, is never moraic

# syllabicity and sonority

| set | members | syllabic |
|---|---|---|
| nonhigh/long vowels | eː aː oː iː əː uː e a o ə | ✓ |
| high Vs, sonorant consonants | i/j u/w l r m n ŋ | % |
| obstruents | v ð z ʒ f θ s ʃ b d dʒ g p t tʃ k | ✗ |

- vowels are (by definition) syllabic, a nonsyllabic vowel is called a consonant (a glide)
- sonorant consonants may be syllabic
- obstruents may not be syllabic

# stressability and sonority

| set | members | stressed |
|---|---|---|
| nonhigh/long vowels | eː aː oː iː əː uː e a o | ✓ |
| schwa, high vowels/glides | ə i/j u/w | % |
| other consonants | r l m n ŋ v ð z ʒ f θ s ʃ b d dʒ g p t tʃ k | ✗ |

- long vowels and e a o are always stressed
- i ə u may be stressed or unstressed
- consonants are never stressed (note r may be stressed in rhotic accents: *bird* bɻ́d)

# putting it all together

| set | members | moraic | syllabic | stressed |
|---|---|---|---|---|
| nonhigh/long vowels | eː aː oː iː əː uː e a o | ✓ | ✓ | ✓ |
| schwa | ə | ✓ | ✓ | % |
| high Vs/glides | i/j u/w | % | % | % |
| liquids, nasals | r l m n ŋ | % | % | ✗ |
| obstruents | v ð z ʒ f θ s ʃ b d dʒ g p t tʃ k | % | ✗ | ✗ |
| | h | ✗ | ✗ | ✗ |

# the two main sources of long vowels in BE

1. loss of nonprevocalic R after short vowel and compensatory lengthening
2. (schwa epenthesis after diphthong,) glide loss and vowel + schwa coalescence

# compensatory lengthening (CL)

| | NURSE | START | NORTH |
|---|---|---|---|
| input (earlier, rhotic English) | ər | ar | or |
| R loss + CL | əː | aː | oː |

# glide loss and vowel + schwa coalescence (= smoothing)

| | FORCE | SQUARE | CURE | NEAR | FIRE | SOUR | COIR |
|---|---|---|---|---|---|---|---|
| input | owr | ejr | uwr | ijr | ajr | awr | ojr |
| epenthesis (& R deletion) | owə | ejə | uwə | ijə | ajə | awə | ojə |
| glide loss | oə | eə | uə | iə | aə | aə | – |
| coalescence | oː | eː | uː | iː | aː | aː | – |

this process is more advanced with vowels to the left than with those to the right

# smoothing is rather general in VGə sequences

- *mail* méjəl%mé꞉l, *wild* wájəld%wá꞉ld
- *lion* lájən%lá꞉n, *Himalaya* himəléjə%himəlé꞉, *vowel* váwəl%vá꞉l
- *diamond* dáj(ə)mənd%dá꞉mənd (syncope bleeds smoothing)
- *theatre* θíjətə%θí꞉tə, but *θíjtə (obstruents block syncope)
- *violence* váj(ə)ləns%vá꞉ləns, but *violate* váj*(ə)lejt (stress blocks syncope)

# three constraints to maintain stressability

recall

- long vowels cannot occur unstressed
- consonants cannot occur stressed

so

1. compensatory lengthening is inhibited in unstressed position
2. smoothing is inhibited in unstressed position
3. syllabic consonant formation is inhibited in stressed position

# no compensatory lengthening in unstressed position

| CL applies in stressed position | no CL in unstressed posision |
|---|---|
| *defer* difə́ː | *differ* dífə(*ː) |
| *bombard* bombə́ːd | *standard* sdándə(*ː)d |
| *concern* kənsə́ːn | *modern* módə(*ː)n |
| *desert* dizə́ːt | *desert* dézə(*ː)t |
| *merger* mə́ːdʒə | *merger* mə́ːdʒə(*ː) |

# no smoothing in unstressed position

| smoothing possible in stressed position | smoothing impossible in unstressed position |
|---|---|
| *idea* ajdíjə%ajdiː | *India* índijə (*-diː) |
| *career* kəríjə%kəríː | *linear* línijə (*-niː) |
| *revere* rəvíjə%rəvíː | *Xavier* zéjvijə (*-viː) |
| *secure* sikjúwə%sikjúː | *jaguar* ʤágjuwə (*-juː) |
| *sulfuric* səlfjúwərik%səlfjúːrik | *sulfuret* sálfjuwəret%-jur-%-jər- (*-juː-) |

# no syllabic consonant formation (SCF) in stressed position

| SCF possible in unstressed position | SCF impossible in stressed position |
|---|---|
| *tunnel* tánəl%tánl̩ | *anull* ənál (*-nĺ) |
| *doctoral* dógtərəl%dógtr̩əl | *immoral* imórəl (*-mŕ-) |
| *Axel* ágsəl%ágsl̩ | *Maxell* mágsel (*-sl̩) |
| *camel* káməl%káml̩ | *Intel* íntel (*-tl̩) |
| *Dixon* dígsən%dígsn̩ | *Exxon* égson (*-sn̩) |
| *caramel* kárəməl%káməml̩ | *philomel* fíləmel (*-ml̩) |

# take-home messages

1. stress is different from accent (and so there is no need for different degrees of stress)
2. stress is lexically given and is related to vowel quality
3. `e a o`, as well as long vowels are always stressed
4. unstressed `ij əw uw` may only be light if the offglide is a consonant
5. English takes various precautions to avoid having long vowels in unstressed position or consonants in stressed position