Announcements

• Midterm exam is not posted. It is due Wed Nov 11 by 8pm via email, or in class if you’re submitting a hard copy.

• Read the instructions carefully and thoroughly!

Help

Complimentary
Difference

Today’s agenda

- Finishing up coarticulation.
- Syllable structure and phonotactics.
- Suprasegmental features.

Coarticulation processes

- Assimilation
- Dissimilation
- Deletion

Epentheses

- Epentheses is a process that inserts a sound. From English:
  - *something* \([\text{sam}\theta\text{ɪŋ}] \rightarrow [\text{samp}\theta\text{ɪŋ}]\)
  - *length* \([\text{lent}\theta] \rightarrow [\text{lentk}]\)
- In Turkish, a sequence of two initial consonants is not allowed. As a result, a vowel is epenthesized to break the consonant cluster:
  - “train,” which is borrowed from English, is pronounced as [tiren]

Metathesis

- Metathesis is a process that changes the order of sounds. Children learning English will typically produce metathesis forms, e.g., *spaghetti* is typically pronounced as *pesghatti* [paʃkəri].

Vowel reduction

- In many languages, vowels in unstressed syllables undergo reduction, typically appearing instead as the weak vowel [a]:
  - *Canada* \([\text{kʰæn}\text{ədə}]\)
  - *Canadian* \([\text{kʰən}\text{əndən}]\)
- This is typical of function words in English, e.g.,
  - Prepositions of [ɔv] and from [fəm]
  - Auxiliaries like can [kən] as in [əi kən go]
More than one process?

• Now, let’s look at these German data:

<table>
<thead>
<tr>
<th>Careful speech</th>
<th>Informal speech</th>
</tr>
</thead>
<tbody>
<tr>
<td>laden [la:dn]</td>
<td>[la:dn] “to load”</td>
</tr>
<tr>
<td>loben [lo:ban]</td>
<td>[lo:bm] “to praise”</td>
</tr>
<tr>
<td>backen [bakan]</td>
<td>[bakŋ] “to bake”</td>
</tr>
</tbody>
</table>

• What’s going on here?

Syllable structure

• Native speakers’ knowledge of syllable structure is manifest in several ways:
  • They can count the number of syllables in a word.
  • They know where to draw syllable boundaries.
  • They rely on syllabification in rhyming and in games like Pig Latin.
  • And as we will see in phonology, they internalize phonological rules that do make reference to the unit ‘syllable.’

• Sounds combine to form larger units called syllables.
  • A syllable must contain a nucleus (typically a vowel) and may also contain consonants before or/and after the nucleus.
  • The consonants before the nucleus vowel are called the onset of the syllable, whereas the consonants after the vowel are referred to as the coda of the syllable. The nucleus and coda are also assumed to form one unit called the rhyme.

• We can represent syllable structure as in the following diagram, where σ = syllable:

```
  σ
 /   \
Onset  Rhyme
     /  \
Nucleus  Coda
```

• So, consider a monosyllabic word such as strange [stræŋ].
  • What is the nucleus? What is the onset? What is the coda?
Syllable structure

• We can represent this syllable type as CCCVCC, and hierarchically as below:

\[
\begin{array}{c}
\text{Onset} \\
\text{[st\ddagger]} \\
\end{array}
\quad \sigma
\quad \begin{array}{c}
\text{Rhyme} \\
\text{Nucleus} \\
\text{[e\ddagger]} \\
\end{array}
\quad \begin{array}{c}
\text{Coda} \\
\text{[nd\ddagger]} \\
\end{array}
\end{array}
\]

Note: Diphthongs count as one V slot, and affricates count as one C slot.

Examples of syllable structures in English

- [e\ddaggerɪ\ddaggern\ddagger] CV.CVC
- [sa\ddaggernd\ddaggerz] CVCCC
- [fæ\ddaggerɛ\ddagger.ɪ\ddaggerts] CV.CV.CVCC

• Notice that we mark a syllable boundary with a dot.

Phonotactics

• When languages allow consonant clusters in onset and coda positions, there are typically constraints on the number and kind of consonants that occur in these clusters. We call such sequential constraints on the occurrence of sounds **phonotactics**.

• English, for example, does not allow words to start with [ŋ], whereas Vietnamese does.

• English may have up to three consonants in onset position (as in [sprei]), but Arabic does not allow that.

• In fact, in English, there is a further restriction in the case of a CCC-onset: the first C has to be [s]; the second has to be a voiceless stop (i.e. [p], [t], or [k]); and the third has to be a liquid or a glide (i.e. [l], [r], [j], or [w]).

• Compare that with Russian onsets in the following words:
  - [fslux] “aloud”
  - [mgla] “fog”
Phonotactics

- Another example of phonotactic constraints in English is the impossibility of words like *[btol]*, where two stops occur initially.

- English also does not allow two long vowels in a row. *[miun]* is bad.

Syllabic Consonants

- In English, nasals and liquids can function as syllable nuclei when they occur in an unstressed syllable at the end of a word after any consonant. In narrow phonetic transcription, syllabic consonants are marked by an under-stroke [ˌ]. Examples:

  - *tunnel* [ˈtʌnəl]  
  - *chasm* [ˈkæzm]  
  - *ladder* [ˈleɪdər]  
  - *button* [ˈbʌtn]

Suprasegmental features

- In addition to “segmental” features, e.g., place of articulation, voicing, tongue height, etc., other phonetic features may “ride on top of” these segmental features.

- Four of these are: length, tone, intonation, and stress.

Length

- The duration of a sound may be influenced by the sounds around it, e.g., compare your pronunciation of the two words in each pair below:
  - *seat* vs. *seed*
  - *leak* vs. *league*
  - *leaf* vs. *leave*

- In narrow phonetic transcription, length is typically marked by a colon-like symbol “ː” after the lengthened sound.

Phonotactics

- Knowledge of phonotactics is part of your subconscious knowledge of your native language.

- This knowledge allows native speakers to distinguish between what is a possible word in their language and what is an impossible word.
Vowel length in Finnish

- In some languages, the long-short contrast is crucial, since substituting a long segment for an otherwise identical short segment in a word can result in a change of meaning. Consider these data from Finnish:

  - [muta] “mud”
  - [mu:ta] “some other”
  - [muta:] “but”

Consonant length (gemination) in Italian

- Italian shows the same length effect for consonants:


Pitch

- Depending on the tenseness of the vocal folds and the amount of air passing through the glottis, we may get either a high or a low pitch.
- Pitch is an auditory property of a sound that allows us to put it on a scale that ranges from low to high.
- Two kinds of controlled pitch movement found in human language are tone and intonation.

Tone

- In many languages, the pitch at which the syllables in a word are pronounced can make a difference in the meaning of the word. These are called tone languages (e.g., Thai, Zulu, Igbo, and Navajo).
- We use the uppercase letters H, M, and L, to stand for high, mid, and low tones. Consider this example from Mandarin:

  - [ma] H “mother”
  - [ma] MH “hemp”
  - [ma] MLH “horse”
  - [ma] HL “scold”

Intonation

- Intonation is the pattern of rises and falls in pitch across a stretch of speech such as a sentence.
- For example, the same string of speech could be interpreted either as a statement or as a question, depending on its intonation contour:

  - Max is studying linguistics. (falling intonation)
  - Max is studying linguistics? (rising intonation)
  - Max is studying linguistics, ... (level intonation)

Stress

- Stress refers to the perceived prominence of a particular syllable relative to syllables around it.
- In essence, stress is the combined effect of pitch, loudness, and length.
- In some languages, stress placement is predictable, e.g., in Czech stress almost always falls on the first syllable, whereas in Welsh stress falls on the next to last syllable.
Stress

• In other languages, like English and Russian, stress is unpredictable and has to be learned for every word.
• In such languages stress placement may also create a difference in meaning:
  * export could be [ˈekspɔːt] or [eksˈpɔːt]
  * present could be [ˈprezənt] or [ˈprɛzənt]

Next class agenda

• Phonology: Read Chapter 6, pp. 224-235, and the section on the rules of phonology (pp. 241-250) and the section on phonological analysis on pp. 260-264.