INTD0112
Introduction to Linguistics

Lecture #6
Sept 23rd, 2009

Announcements

- Linguistics Series talks. Extra credit.
- Homework assignment #2 is now posted. It is due next Wednesday Sept 30th.
- Chris’ youtube video clip:
  http://www.youtube.com/watch?v=DywU5UXQ-WQ
- Zack’s anecdote.

Today’s agenda

- Finish our description of consonants.
- Discuss vowels.
- Talk about some of the articulatory processes that take place in human languages in connected speech.

Consonants cont.

Aspiration of voiceless stops

- In English, the voiceless stops are produced with an extra puff of air when occurring initially. Compare your pronunciation of the [p], [t], and [k] sounds in both words in each of the following pair:
  - pit vs. spit
  - tar vs. star
  - cool vs. school

Aspiration

- The voiceless stops in the first words are characterized as “aspirated” sounds, which distinguish them from the unaspirated voiceless stops that do not occur initially.
- In phonetic transcription, we indicate this difference in aspiration by superscripting the aspirated sound with [ʰ], e.g., pit [pʰɪt]; spit [spɪt].
Voice onset time

Nonpulmonic consonants
- The consonants we talked about so far are all produced by egressive pulmonic airstream.
- Ingressive pulmonic consonants are typically used for emotional effects. Norwegian ya.
- Human languages also have consonants that are produced by nonpulmonic airstream.
- Glottalic airstream gives us ejectives and implosives, whereas velaric airstream gives us clicks.

Sequence of an Ejective Velar Stop

Sequence of a Bilabial Implosive

Articulatory sequence of an Alveolar click

Peter Ladefoged’s sound files
- Ejectives in Lakhota.
- Implosives in Sindhi.
- Clicks in !Xóõ.
Vowels

Vowels are distinguished from consonants in that the passage through which the air travels is never so narrow as to obstruct the free flow of the airstream.

It’s hard, however, to characterize vowels according to the same features that we have used in characterizing consonants. Do you see why?

Parameters for vowel articulation

- Therefore, to distinguish between different vowels, we rely on four other features:
  - (a) tongue height,
  - (b) tongue advancement,
  - (c) lip rounding, and
  - (d) tenseness or laxness of the vocal tract.

Tongue height: High, Mid, or Low

- Tongue height refers to whether the vowel sound is produced with the tongue high in the mouth or low in the mouth.
- The difference between the two sounds [i] in beat and [æ] in bat, for example, is that the first is produced with the tongue high in the mouth, whereas the latter is produced with the tongue low in the mouth. We call [i] a high vowel, and [æ] a low vowel.
- If the tongue is raised to a height midway between high and low we get a mid vowel, e.g., the sound [e] in bait and the sound [æ] in bet.

Tongue advancement: Front, Back, or Central

- Difference in tongue height is not enough, however, since two vowels may have the same height property, e.g., [i] as in beat and [u] as in boot are both high vowels.
- To distinguish between these two vowels we rely on a second property of the tongue: whether the tongue is advanced (i.e., pushed forward), retracted (i.e., pushed back), or neither, giving rise to front, back or central vowels, respectively.

Tongue advancement: Front, Back, or Central

- When producing [i], you’ll notice that it is the front part of the tongue that is raised in the mouth; for [u], it is the back part of the mouth. We call [i] a high front vowel, and [u] a high back vowel, therefore.
- If the highest point of the tongue in the mouth is somewhere between front and back, we get a central vowel, e.g., the sound schwa [ə], which occurs finally in words such as sofa or initially in words such as about.
Lip rounding

- Vowels are also distinguished according to the shape of the lips while producing them. For example, [u] as in *moon* is produced with **rounded** lips, whereas [æ] as in *man* is an **unrounded** vowel.

Tense vs. lax vowels

- Some vowels might share the same features for tongue height, tongue highest point, and lip rounding. For example [i] as in *heat* and [ɪ] as in *hit* are both front high unrounded vowels.
- Such pairs of vowels are usually distinguished by a **tense vs. lax** feature: [i] is produced with greater vocal tract constriction than [ɪ]. We say that [i] is a tense vowel, whereas [ɪ] is a lax vowel. Note that tense vowels are also longer.

English vowel chart

- A vowel chart for BBC English vowels is given in your textbook in Figure 2.2, p. 40.
- For this class, we will use the chart on the next slide for American English vowels.

American English Vowels

- [i] beat
- [ɪ] bit
- [ɛ] bait
- [ɛ] bet
- [æ] bat
- [ʌ] butt
- [ə] about, sofa
- [u] boot
- [ʊ] put
- [ɑ] boat
- [ɔ] bought
- [æ] bomb (bot?)

Diphthongs

- Two sounds (often a vowel and a glide) may combine together to form a **diphthong** (that is, a compound vowel). Examples of diphthongs in American English are given below:
  - [æ] as in *die*
  - [aʊ] as in *now*
  - [ɔɪ] as in *toy*
- Note that the vowels in *bait* and *boat* are also typically pronounced as diphthongs, and are therefore frequently transcribed as [ej] and [ow], respectively.
Nasalization of vowels

- Vowels, like consonants, can be produced with a raised velum that prevents the air from escaping through the nose, or with a lowered velum that permits air to pass through the nasal passage.
- When the nasal passage is blocked, oral vowels are produced; when the nasal passage is open, nasal or nasalized vowels are produced.

In English, nasal vowels typically occur before nasal consonants. Compare, for example, the vowel in bat and ban. In transcription, the diacritic \( [-] \) is placed over the vowel to indicate that it is a nasalized vowel, as in bean [bĩn] and bone [bōn].

Transcription

- Phonetic transcription is a representation of the pronunciation of a word using IPA symbols.
- Transcription could be broad, in which case a minimal amount of phonetic detail is given, or narrow, in which case more detailed phonetic differences are provided.
- For now, let’s stick to broad transcription.

Broad Phonetic Transcription

<table>
<thead>
<tr>
<th>Word</th>
<th>Broad Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ɹøjɪɾa]</td>
<td></td>
</tr>
<tr>
<td>[lɛkt[ə] or [lɛktə]</td>
<td></td>
</tr>
<tr>
<td>[sawndz]</td>
<td></td>
</tr>
<tr>
<td>[ʃæntɪks]</td>
<td></td>
</tr>
</tbody>
</table>

Speech production and coarticulation

- So far, we described segments as if they are articulated in isolation. Of course, this is not the case in connected speech. Sounds are typically produced while more than one articulator is active.
- As a result of coarticulation, sounds may get to affect other sounds in speech (as we’ve seen in nasalization and devoicing for example).
- These are called articulatory processes.
Articulatory processes

- There are several types of articulatory processes in human language. We discuss a few here. We’ll get back to this issue again, though, when we talk about historical linguistics and language change.

Assimilation: Regressive

- Assimilation is an articulatory process whereby a sound is made “similar” to a neighboring sound.
- Vowel nasalization in English is an instance of regressive assimilation: can’t [kæn’t]

Assimilation: Progressive

- Assimilation can also be progressive, as in Scots Gaelic:
  - [nɛ:l] “cloud”
  - [mʊ:] “about”

Assimilation in voicing

- While liquids and glides are voiced sounds, when preceded by a voiceless stop, they get “devoiced.” We indicate that by a [•] underneath the liquid or the glide. Examples:
  - place [plejʃ]
  - quick [kwɪk]
  - trim [tɪm]
- Similarly, voiceless sounds may become voiced in the neighborhood of voiced sounds, e.g., Dutch af [af] (“over”) is pronounced with a [v] in the words afbellen (=cancel) and afdekken (=cover).

Assimilation in place of articulation

- Nasal consonants typically assimilate to the place of articulation of the following sound. From English:
  - possible → impossible [mp]
  - tangible → intangible [nt]
  - complete → incomplete [ŋk]
- Question: Is this a case of regressive or progressive assimilation?

Assimilation in place of articulation

- 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 [laːdən]</td>
<td>[laːdn] “to invite”</td>
</tr>
<tr>
<td>loben [loːbən]</td>
<td>[loːbm] “to praise”</td>
</tr>
<tr>
<td>backen [bakən]</td>
<td>[bakŋ] “to bake”</td>
</tr>
</tbody>
</table>
  
- What’s going on here?
Dissimilation

- Dissimilation is an articulatory process whereby two sounds are made less similar. From English:
  
  fifths $\rightarrow$ [fíʃs]

Deletion

- Deletion is a process which removes a segment from certain phonetic contexts. From English: 
  suppose $\rightarrow$ [spówz]

- Deletion may also occur as an alternative to dissimilation for some speakers in words like 
fifth:
  fifths $\rightarrow$ [fíʃs]

Epenthesis

- Epenthesis is a process that inserts a segment within an existing string of segments. From English:
  something $\rightarrow$ [sʌmbθŋ]

- 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 segments. Children learning English will typically produce metathesis forms, e.g.,
  spaghetti is typically pronounced as pesghatti [pɔskɛri].

Vowel reduction

- In many languages, vowels in unstressed syllables undergo reduction, typically appearing instead as the weak vowel $\theta$:
  
  Canada $\rightarrow$ [kʰənədə]

  Canadian $\rightarrow$ [kʰənejdiən]

Next class agenda

- Prosodies.
- Introduction to Phonology.