

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* [p^hɪt]; *spit* [spɪt].

Voice onset time

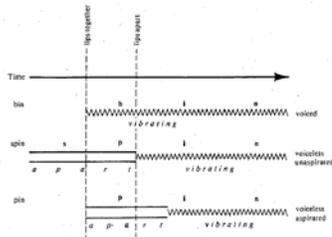
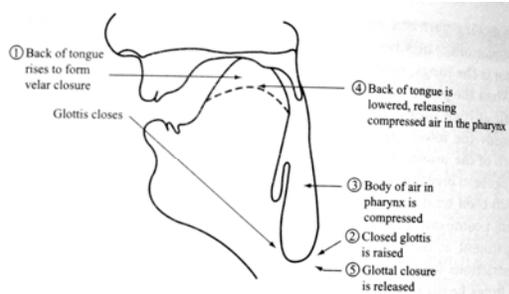


Figure 6.2 Timing of articulation and vocal-cord vibrations for voiced, voiceless, unaspirated, and voiceless aspirated stops.

Nonpulmonic consonants

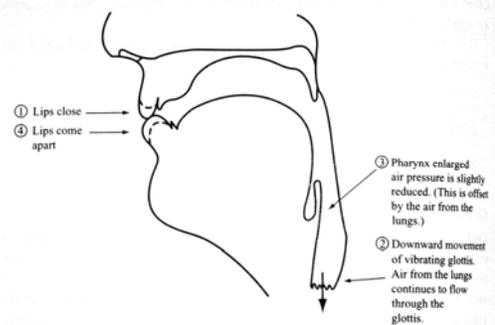
- The consonants we talked about so far are all produced by egressive pulmonic airstream.
- Ingressive pulmonic consonants are typically used for emotional effects. Norwegian ya.
- Human languages also have consonants that are produced by nonpulmonic airstream.
- Glottalic airstream gives us ejectives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

Sequence of an Ejective Velar Stop



Adapted from Asbey & Maidment, 2005

Sequence of a Bilabial Implosive



Articulatory sequence of an Alveolar click

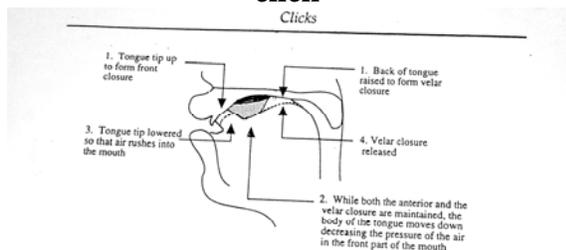


Figure 8.1 The articulatory sequence involved in production of an alveolar click in !Xóó. The dark shaded area shows the cavity enclosed when the closures are formed. The light shaded area shows the cavity just before the release of the anterior closure. The dashed lines show the lowered tongue positions corresponding to steps 3 and 4.

Peter Ladefoged's sound files

- Ejectives in Lakhota.
- Implosives in Sindhi.
- Clicks in !Xóó.

Vowels

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 [ɛ] 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.

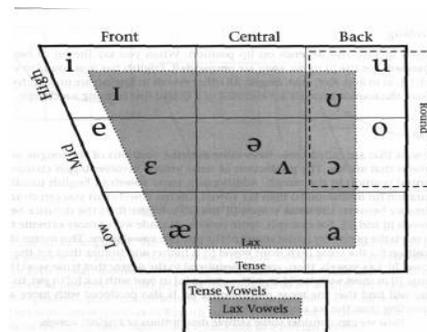


Figure 1. The vowels of English.

American English Vowels

- | | |
|------------------------------------|-----------------|
| ■ [i] beat | [u] boot |
| ■ [ɪ] bit | [ʊ] put |
| ■ [e] bait | [o] boat |
| ■ [ɛ] bet | [ɔ] bought |
| ■ [æ] bat | [ɑ] bomb (bot?) |
| ■ [ʌ] butt | |
| ■ [ə] <u>a</u> bout, sofa <u>a</u> | |

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:
 - [aj] as in *die* [aw] as in *now*
 - [ɔj] 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.

Nasalization of vowels

- 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* [bɪ̃n] and *bone* [bō̃wn].

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

Word	Broad Transcription
	[ˌɛj̩nɪŋ]
	[lɛktʃə] or [lɛkʃə]
	[sawndz]
	[fəˈnɛtɪks]

Broad Phonetic Transcription

[nəʊm tʃɑmski ɪz ə lɪŋgwɪst hu tɪtʃəz ət ɛm əj ti]

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 [k^hæ̃nt]

Assimilation: Progressive

- Assimilation can also be **progressive**, as in Scots Gaelic:
[nē:l] “cloud”
[mū:] “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 [pl̥eɪs]
quick [kw̥ɪk]
trim [t̥ɪm]
- 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:
Careful speech Informal speech
laden [la:dən] → [la:dn] “to invite”
loben [lo:bən] → [lo:bm] “to praise”
backen [bakən] → [bakŋ] “to bake”
- What's going on here?

Dissimilation

- Dissimilation is an articulatory process whereby two sounds are made less similar.

From English:

fifths [fɪfθs] → [fɪfts]

Deletion

- Deletion is a process which removes a segment from certain phonetic contexts. From English:
suppose [səp^hɔwz] → [spɔwz]
- Deletion may also occur as an alternative to dissimilation for some speakers in words like *fifth*:
fifths [fɪfθs] → [fɪfs]

Epenthesis

- Epenthesis is a process that inserts a segment within an existing string of segments. From English:
something [sʌmθɪŋ] → [sʌmpθɪŋ]
length [lɛŋθ] → [lɛŋkθ]
- 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 [tɪren]

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* [pɛskɛri].

Vowel reduction

- In many languages, vowels in unstressed syllables undergo reduction, typically appearing instead as the weak vowel [ə]:
Canada [k^hænədə]
Canadian [k^hənejdɪən]

Next class agenda

- Prosodies.
- Introduction to Phonology.