

24.900: Introduction to Linguistics

April 4, 2005

Goals for today's class:

- a. Review of the big picture. "What is linguistics and who cares?"**
- b. Review basic parameters for describing consonant sounds**
- c. The dimensions for vowel description**
- d. Major classes of human sounds**
- e. Some prosodic suprasegmental features**

- I. Check the MIT server for resources pertaining to phonetics/phonology. There are links under the "Materials" section for "phonetics" and "phonology" for downloading IPA fonts; full IPA inventory; videotapes of heads articulating different sounds, etc., etc. If you are having difficulty with getting the IPA fonts to work on Mac OS X, *Google* "Yamada" and download the pre-'93 fonts for Mac. These work.
- II. Be sure to keep up with the reading from your textbook, Chapter 6. The textbook can fill in in detail the topics we cover in class.
- III. Some notes about your mid-term evaluations
- IV. A word about the course of phonological development in children.
- V. Phonetic transcriptions from 3/28/05:

- VI. Transcribe the following sentences into regular English spelling:
- a. nom tʃɑmski Iz e lɪŋgwɪst hu tɪtʃəz æt ɛm əj ti
 - b. fonetɪks Iz ðə stɑdi əv spɪtʃ sawndz
 - c. In wʌn dajələkt əv ɪŋglɪʃ kət ðə nawn ænd kət ðə vərb ar prɔnawnst ðə sem
 - d. sʌm pɪpəl θɪŋk fonetɪks Iz vəri ɪntərəstɪŋ
- VII. What three factors do we always want to consider when we describe consonants?

VIII. VOWELS

(Language Files 7th edition; Ohio State University: 1998)

- a. Vowels are the most sonorant, or intense, and the most audible sounds in speech.
- b. They usually function as the nucleus of a syllable /mother/ moth*er.
- c. The consonants that surround them often depend on the vowel for their audibility. For example, in the word *pop*, neither [p] has much sound of its own; the [p]s are heard mainly because of the way they affect the beginning and end of a vowel sound.
- d. We transcribe vowels using different features than those we use for consonants.
- e. Vowels are sounds produced with a relatively open vocal tract, so that they do not have a consonant-like point of articulation (place of constriction) or manner of articulation (type and degree of constriction), and they are almost always VOICED (see my note on the discussion board about the Mexican language that has voiceless vowels).
- f. Vocal fold vibration is the sound source for vowels. The vocal tract above the glottis acts as a resonator affecting the sound made by the vocal folds. The shape of the resonator determines the quality of the vowel—[i] vs. [u] vs. [a], for example.

g. There are several ways in which speakers can change the shape of the vocal tract and thus change vowel quality. They do this by:

- Raising or lowering the body of the tongue
- Rounding or not rounding the lips
- Making these movements with a tense or a lax gesture
- Advancing or retracting the body of the tongue

When describing a vowel, it is necessary to provide information about these four aspects (actually we will not ask you for information about advancing or retracting the tongue for this class; however, be aware that this property of description exists) of the articulation of the vowel.

Some more class exercises:

What phonetic property or feature distinguishes the sets of sounds in column A from those in column B?

A

1. [i] [I]

2. [p] [t] [k] [s] [f]

3. [p] [b] [m]

4. [i] [I] [u] [ʊ]

5. [f] [v] [s] [z] [ʃ] [ʒ]

6. [i] [I] [e] [ə] [ɛ] [æ]

B

[u] [ʊ]

[b] [d] [g] [z] [v]

[t] [d] [n] [k] [g] [ŋ]

[e] [ɛ] [o] [ɔ] [æ] [a]

[tʃ] [dʒ]

[u] [ʊ] [o] [ɔ] [a]

IX. How to describe your basic VOWELS:

a. Tongue Height: repeat the words *seat, set, sat* [i], [ɛ] [æ]

What happens? You should be opening your mouth a bit wider as you change from [i] to [ɛ] and then a little wider as you go from [ɛ] to [æ].

These varying degrees of openness correspond to different degrees of tongue height: *high for [i], mid for [ɛ] and low for [æ].*

b. High vowels like [i] are made with the front of the mouth less open because the tongue body is raised or high. The high vowels of English are [i, I, u, ʊ] as in *leak, lick, Luke, look.*

c. Low vowels like [æ] in *sat* are pronounced with the front of the mouth open and the tongue lowered. The low vowels in English are [æ, a] as in *sat/cat, cot.*

d. Mid vowels like [ɛ] *set* are produced with an intermediate tongue height; in English the mid vowels are [e, ɛ, ʌ, ɔ , o] as in *bait, bet, but, bought, boat.* Note that the vowel [ə] as in the last syllable of *sofa* is simply unstressed [ʌ].

e. Lip rounding: Vowel quality also depends on lip position. When you say the [u] in *two*, your lips are rounded. For the [i] in *tea*, they are unrounded. English has four rounded vowels: [u, ʊ, o, ɔ]as in *loop, foot, soap, caught.* All other vowels in English are unrounded.

f. Tenseness: Vowels that are called **tense** have more extreme positions of the tongue or the lips than vowels that are **lax**. The production of tense

vowels involves bigger changes from a mid central position in the mouth. On the vowel chart, you can see that the distance between tense vowels [i] and [u] is bigger than the distance between the lax vowels [ɪ] and [ʊ].

For example, tense vowels are made with a more extreme tongue gesture to reach the outer peripherals of the vowel space. What this means is that the tongue position for the tense high front vowel [i] is higher and fronter than for the lax high vowel [ɪ]. Lax vowels are not peripheral, on the outer edge of the possible vowel space. Compare tense [i] in *meet* with lax [ɪ] in *mitt*, or tense [u] in *boot* with lax [ʊ] in *put*. In the latter case you will find the tensed vowel [u] is also produced with more and tighter lip rounding than the lax counterpart [ʊ].

Tense

i beat

e bait

u boot

o boat

Lax

ɪ bit

ɛ bet

ʊ put

ɔ bore

g. Tongue Advancement: Besides being held high, mid or low, the tongue can also be pushed forward or pulled back within the oral cavity. For example, in the high front vowel [i] as in *beat*, the body of the tongue is raised and pushed forward so it is just under the hard palate. The high back vowel [u] of *boot*, on the other hand, is made by raising the body of the tongue in the back of the mouth, toward the velum. The tongue is advanced or pushed forward for all the front vowels [i, ɪ, e, ɛ, æ] as in *seek, sick, sake, sec, sack* and retracted or pulled back for the back vowels [u, ʊ, o, ɔ, a] as in *ooze, look, road, paw, dot*. The central vowels [ʌ] as in *luck* or [ə] as the first vowel in the word *another* require neither fronting nor retraction of the tongue.

VIII. Sample descriptions of English vowels;

- [i] as in *beat*, is high, (front) unrounded and tense.
- [ɔ] as in *caught*, is mid, (back), rounded and lax.
- [a] as in *cot*, is low, (back), unrounded and lax.
- [e] as in *cake*, is mid, (front) unrounded and tense.

IX. DIPHTHONGS

- a. Sequence of two sounds, vowel + glide.
- b. Simple vowels are called monothongs.
- c. The vowel sound in the word *bite* [bajt] has the [a] vowel sound of *father* followed by the [j] glide resulting in the diphthong [aj].
- d. The vowel in *bout* [bawt] is [a] followed by the glide [w] resulting in the glide [aw].
- e. The third diphthong that appears in English is the vowel sound in *boy* which is the vowel [ɔ] of *bore* (without the [r]) followed by the palatal glide [j] resulting in the diphthong [ɔj].

X. Nasalization

- a. When the nasal passage is blocked (raised velum that prevents the air from escaping through the nose), *oral* vowels are produced.
- b. When the nasal passage is open (lowered velum) nasal vowels result.
- c. In English, nasal vowels occur for the most part before nasal consonants in the same syllable, and oral vowels occur in all other places.
- d. The words *bean*, *bin*, *bane*, *boon*, *bun*, *beam*, *bam*, *bang*, *bong* are all examples of words that contain nasalized vowels.
- e. To indicate nasalization, we place a ~ over the vowel.
- f. In languages like French, Polish and Portuguese, nasalized vowels occur without nasalized consonants.

XI. Major Classes

There are many different ways that linguists describe speech sounds.

Consider the biologist who can describe life in broader or narrower terms animals vs. plants, within animals vertebrates vs. invertebrates, and within vertebrates mammals vs. reptiles and so on.

Linguists also describe speech sounds in broader and narrower terms.

a. Noncontinuants and continuants:

Stop sounds are noncontinuants as we discussed in class on Monday. There is a total obstruction of the airstream in the oral cavity. They include the nasal stops (despite the fact that air flows continuously out the nose). All other consonants and vowels are continuants in which the air flows out the mouth.

b. Obstruents and sonorants:

The non-nasal stops [p,b, t,d, k, g], the fricatives [f,v,ʃ, ʒ, θ, ð, s, z,] and the affricates [tʃ, dʒ] form a major class of sounds called **obstruents**. The airstream may be fully obstructed as in non-nasal stops and affricates, or partially obstructed as in the production of fricatives.

Fricatives are **continuant** obstruents.

Non-nasal stops and affricates are **noncontinuant** obstruents; there is a complete blockage of the air during the production of these sounds.

Sounds that are not obstruents are **sonorants**. Sonorants are produced with relatively free airflow through either the mouth or the nose. They have greater acoustic energy than obstruents. Nasal stops are **sonorants** [m, n, ŋ] because although the air is blocked in the mouth, it continues to resonate and move through the nose. Vowels, the liquids [l] and [r] and the glides [w] and [j] are also **sonorants** because the air resonates as it flows relatively undisturbed through the vocal tract.

c. **Consonants and vowels:**

Nasals, liquids, and obstruents are all grouped together into a larger class called **consonantal**. While all consonantal sounds are consonants, not all consonants are consonantal. Glides are **not** consonantals. They pattern with the vowels to make up the class that is referred to as **vocalic** sounds.

XI. More terms to classify consonants:

- a. **Labials:** [p], [b], [m], [f], [v]. These are sounds articulated with the involvement of the lips.
- b. **Coronals:** [t], [d], [n], [s], [z], [ʃ], [ʒ], [ʃ], [dʒ], [l]: These include the alveolars, the palatals, the affricates, and the liquid [l]. These are sounds articulated by raising the tongue blade.
- c. **Anterior:** [p], [b], [m], [f], [v], [θ], [ð], [t], [d], [n], [s], [z]: These are consonants produced in the front part of the mouth, that is, from the alveolar area forward. They include the labials, the interdental, and the alveolars.
- d. **Sibilants:** [s], [z], [ʃ], [ʒ], [tʃ], [dʒ]: These sounds are characterized by an acoustic rather than an articulatory property of its members. The friction created in the production of fricatives and affricates causes a hissing sound, which is a mixture of high-frequency sounds.

XII. Prosodic suprasegmental features:

a. **Length: a:**

Speech sounds that are identical in their place or manner features may differ in length (duration), pitch or loudness. Tense vowels are usually longer than lax vowels. However, when a vowel is prolonged to around twice its normal length, it is considered in some languages a different vowel, and it can make a difference between words.

Japanese: *biru* building

bi:ru (*biiru*) beer

A long vowel is also called a geminate vowel.

Japanese, Finnish and Italian, for example, also have geminate consonants that make a difference in words. When a consonant is long, either the closure or obstruction is prolonged.

Japanese short “k” *saki* ahead

long “k” *sakki* before

English does not use vowel or consonant length to change a word.

No NOOOOOOO NOO all mean NO

b. Pitch: depends on how fast the vocal cords vibrate; the faster they vibrate, the higher the pitch. If the larynx is small, as in children and women, the shorter vocal cords vibrate faster and the pitch is higher, all else being equal.

c. Stress: In many languages, certain syllables in a word are louder, slightly higher in pitch, and somewhat longer in duration (but not geminate) than other syllables in a word. They are *stressed* syllables.

Digest (noun) **digest** (verb)

English is a stress language. In general, at least one syllable is stressed in an English word. French is not a stressed language. The syllables have approximately the same loudness, length and pitch.

d. Tone and Intonation: Speakers have the ability to control the level of pitch in their speech. This is accomplished by controlling the tension of the vocal folds and the amount of air that passes through the glottis. The combination of tensed vocal folds and greater air pressure results in higher pitch on vowels and sonorant consonants, while less tense vocal folds and lower air pressure result in lower pressure. Two kinds of controlled pitch are *tone* and *intonation*.

A language is a **tone** language when differences in word meaning are signaled by differences in pitch. Pitch on forms in tone languages function very differently from the movement of pitch in a non-tone language.

Compare: a car. A car?

Chinese: ma (five tones) (all signal different meanings; we will see that in some languages **tone** is **phonemic**)

Intonation is pitch movement in spoken utterances that is not related to differences in word meaning. However, intonation often does serve to convey information of a broadly meaningful nature. For example, the falling pitch we hear at the end of statement in English such as *Susan blasted the flames*. Signals that the utterance is complete.

- **Terminal** intonation contour
- **Nonterminal** intonation contour: a rising or level intonation contour that signals incompleteness.

Length, pitch and stress are *prosodic* or *suprasegmental* features.