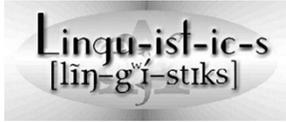


# LNGT0101

## Introduction to Linguistics



Lecture #6  
Sept 28<sup>th</sup>, 2011

## Announcements

- Homework #2 will be posted shortly after class. It is due Wednesday October 5<sup>th</sup> by e-mail no later than 8pm; however, if you plan to submit a handwritten copy, then you do have to turn it in in class that day. Delay policy applies.
- There is a DVD part in the homework, so bear this in mind as you plan to do it.
- Aaron's investigation of Michi's and Rahul's questions.

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## Agenda

- Finish talking about vowels.
- Transcription.
- Talk about some of the articulatory processes that take place in connected speech.
- Talk about prosodic features.

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## Vowels

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## Parameters for vowel articulation

- To distinguish between different vowels, we rely on four articulatory features:
  - (a) **Tongue height: High, Mid, and Low**
  - (b) **Which part of the tongue is involved: Front, Central, and Back**
  - (c) **Lip rounding: Rounded and Unrounded**
  - (d) **Tenseness or laxness of the vocal tract: Tense and Lax**

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## American English Vowel Chart

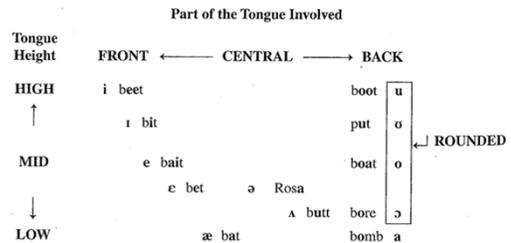


FIGURE 6.5 | Classification of American English vowels.

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## American English Vowel Chart

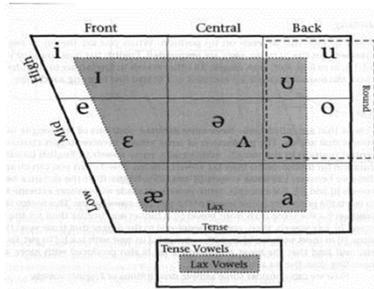


Figure 1. The vowels of English.

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## Diphthongs

- Two vowels may combine together to form a **diphthong**. Examples of diphthongs in American English are given below:
  - [aɪ] 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 [eɪ] and [oʊ], respectively.
- (Note: In many books, the second vowel of a diphthong is frequently represented as a glide, e.g., [aɪ̯], [aʊ̯], [ɔɪ̯], [eɪ̯] or [oʊ̯].)

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## Nasalization of vowels

- Vowels can be either **oral** or **nasal**.
- 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 *ban* [bãn] and *boom* [bũm].

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<http://www.uiowa.edu/~acadtech/phonetics/#>

- Now visit this link again for the articulation of the vowels of American English (German and Spanish are also available if you like to check out these).
- Notice that there may be some slight differences between this link and your textbook concerning phonetic symbols, but it is a very useful link, particularly the animated diagrams.

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## Transcription

- Phonetic transcription** is a representation of the pronunciation of a word using IPA symbols. It is typically given between [ ].
- 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 (e.g., aspiration of voiceless stops and nasalization of vowels).
- The difference is illustrated on the next slide.

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## Broad vs. Narrow Phonetic Transcription

Word	Broad Transcription	Narrow Transcription
?	[jɛnɪŋ]	[jɛ̃nĩŋ]
?	[lɛktʃə] or [lɛkʃə]	[lɛktʃə] or [lɛkʃə]
?	[saʊndz]	[saũndz]
?	[fɛnɛtɪks]	[fɛnɛtɪks]
?	[tʌŋg]	[tʰʌŋg]

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## Transcribing sentences

[nom tʃɑmski ɪz e lɪŋgwɪst hu tɪtʃɪz æt ɛm ɑr ti]

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## Exercises from the textbook

- Exercise 1 (p. 261): Words a-e.
- Exercise 2 (p. 261): Words a-e.
- Exercise 3 (p. 261): Words a-e.
- Exercise 5 (p. 262): Words a-e.

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## Speech production and coarticulation

- So far, we described sounds 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 this *coarticulation*, sounds may get to affect neighboring sounds in speech (as we've seen in nasalization for example).
- These are called *articulatory processes*. We discuss a few here.

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## 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<sup>h</sup>æ̃nt]

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## Assimilation: Progressive

- Assimilation can also be **progressive**, as in Scots Gaelic:

[ñ̩:l]      “cloud”  
[m̩̃:]      “about”

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## Assimilation in voicing

- While liquids and glides are voiced sounds, when preceded by a voiceless stop, they get “devoiced.” We indicate that by a [ ̥ ] below the liquid or the glide. Examples:  
*place*      [pl̩̥eɪs]  
*quick*      [kw̩̥ɪk]  
*trim*      [t̩̥ɪm]
- 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 *afbell* (=cancel) and *afdekken* (=cover).

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## Assimilation in place of articulation

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

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## Dissimilation

- Dissimilation is an articulatory process whereby two sounds are made less similar. From English:
  - fifths* [fɪfθs] → [fɪfts]

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## Deletion

- Deletion is a process which removes a sound from certain phonetic contexts. From English:
  - suppose* [sə'pʰoʊz] → [spʊz]
- Deletion may also occur as an alternative to dissimilation for some speakers in words like *fifths*:
  - fifths* [fɪfθs] → [fɪfs]

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## Epenthesis

- Epenthesis is a process that inserts a sound. 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 [tiren]

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## 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* [pəskɛrɪ].

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## Vowel reduction

- In many languages, vowels in unstressed syllables undergo reduction, typically appearing instead as the weak vowel [ə]:
  - Canada* [kʰænədə]
  - Canadian* [kʰənɛɪdɪən]

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## More than one process?

- Now, let's look at these German data:

### Careful speech

laden [la:dən]

loben [lo:bən]

backen [bakən]

### Informal speech

→ [la:dn] "to load"

→ [lo:bm] "to praise"

→ [bakŋ] "to bake"

- What's going on here?

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## Syllables

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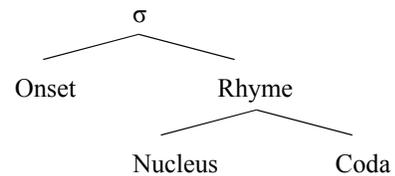
## Syllable structure

- 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**.

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## Syllable structure

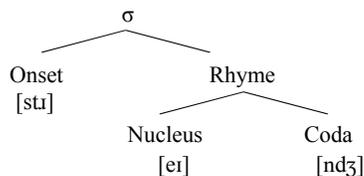
- We can represent syllable structure as in the following diagram:



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## Syllable structure

- For example, a word such as *strange* [stɹeɪndʒ] has [ɹeɪ] as nucleus, [stɹ] as onset, and [ndʒ] as coda. We can represent this syllable linearly as CCCVCC, and hierarchically as below:



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## Syllable structure

- English is rather unusual in allowing a large number of syllable structures. Compare other languages:

Hebrew	Japanese	Hawaiian	Indonesian
CV	V	V	V
CVC	CV	CV	VC
CVCC	CVN		CV
			CVC

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## Syllable structure

- All languages have syllables. The shapes of these syllables are governed by various constraints. Some universal tendencies are observable though. For example,
  - (a) Syllable nuclei usually consist of one vowel.
  - (b) Syllables usually begin with onsets.
  - (c) Syllables often end with codas.
  - (d) Onsets and codas usually consist of one consonant.
- Given these tendencies, the most common syllable structure in human languages is CV and CVC.

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## Phonotactics

- When languages allow consonant clusters in onset and coda positions, there are typically constraints on the kind of consonants that occur in these clusters. We call such sequential constraints on the occurrence of consonants *phonotactics*.
- Languages differ in what is regarded as a permissible combination of consonants in each. English, for example, does not allow words to start with [ŋ], whereas Vietnamese does.

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## Phonotactics

- English may have up to three consonants in onset position (as in [spreɪ]), but Arabic does not allow that.
- In fact, in English, there is a further restriction in the case of a three-consonant onset that the first consonant has to be [s], the second has to be a voiceless stop (i.e. [p], [t], or [k]), and 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”
  - [mglɑ] “fog”

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## Phonotactics

- Another example of phonotactic constraints in English is the impossibility of words like [bɹɒl], where two stops occur initially.
- 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.
- This phonotactic knowledge is also the reason why native speakers syllabify words correctly.

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## 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 [̩].
- Examples:
  - tunnel* [tʰʌnɪ̩]
  - ladder* [lædɪ̩]
  - chasm* [kʰæz̩m]
  - button* [bʌt̩n]

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## 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.”

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## Prosodies (aka Suprasegmentals)

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## Suprasegmental features

- So far we have looked at “segmental” features, e.g., place of articulation, voicing, tongue height, etc.
- Other phonetic features may “ride on top of” these segmental features, and that’s why we call them “suprasegmentals.”
- Four of these are: length, tone, intonation, and stress.

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## 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 “:” after the lengthened sound.

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## 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”

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## Consonant length (gemination) in Italian

- Italian shows the same length effect for consonants:

fato [fatɔ] “fate” vs. fatto [fat:tɔ] “fact”

casa [kasa] “house” vs. cassa [kas:a] “box”

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## 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**.

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## 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”

[Link to Thai tones](#)

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## 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)

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## 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.

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## 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 [ˈɛkspɔːt] or [ɛksˈpɔːt]

*present* could be [ˈpɪɛzɪnt] or [pɪɛˈzɛnt]

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## Next class agenda

- Phonology: Phonemes and allophones. Chapter 7, pp. 272-296.

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