Phonology IV

FSEM CORE S119: Language as Human Nature
Fall 2025
Prof. Forrest Davis

September 11, 2025

Warm-up

1. Discuss with your neighbor your favorite dessert
2. In Kikuyu, which is a Bantu language spoken by around 6.6 million people, some vowels are long (in duration; marked with ':') while others are short. Are long and short vowels allophones of the same phonemes or different phonemes? If they are allophones of the same phoneme, provide a phonological rule to account for their distribution.

[kera]	'cross over'	[keːra]	'realize'
[ðaka]	'beautiful'	[ðaːka]	'play'
[kua]	'die'	[kuːa]	'carry'
[ðura]	'spit'	[ðuːra]	'stay'
[kɔra]	'find'	[kɔːra]	'little frog'

Logistics

- Living and Learning Workshop Friday Sep 12

Learning Objectives

- Describe the IPA representation of vowels in English
- Read and transcribe English using the IPA
- Describe the basic components of syllables and syllabification
- Give a sketch of the phonotactic constraints of English

Summary: We cover the basic articulatory properties of English vowels. Then, we turn to the structure of syllables and the phonotactics of English.

Articulatory Parameters for English Vowels

WE TURN TO THE REPRESENTATION of vowels in the International phonetic Alphabet (IPA) with an emphasis on English. Recall, the aims of the IPA are to associate with every sound one and only one symbol. We identify the sound corresponding to a symbol based on articulatory phonetics. For vowels, English makes use of four parameters:

The discussion here draws from Seth Cable's wonderful Introduction to Linguistic Theory materials taught at University of Massachusetts Amherst.

1. Tongue **Height** (how close to roof of the mouth)
2. Tongue **Backness** (how far back in mouth)
3. Lip **Rounding** (whether lips are 'puckered')
4. Tongue **Tenseness** (how 'tense' the tongue is)

Height

- High: very close to the roof of the mouth
  - [i] 'ee'-sound (heat)
  - [u] 'oo'-sound (hoot)
- Mid: mid-way between roof of mouth and jaw
  - [e] 'ay'-sound (hate)
  - [o] 'oh'-sound (hope)
- Low: lowered to the jaw
  - [ae] 'a'-sound (hat)
  - [ɑ] 'ah'-sound (hot)

Backness

- Back: close to the back of the mouth
  - [u] 'oo'-sound (hoot) high back
  - [o] 'oh'-sound (hope) mid back
  - [ɑ] 'ah'-sound (hot) low back
- Central: midway between back and front
  - [ʌ] 'uh'-sound (cut) low central
  - [ə] 'uh'-sound (sofas) mid central
  - [ɨ] 'uh'-sound (roses) high central
- Front: at the front of the mouth

  - [i] 'ee'-sound (heat) high front
  - [e] 'ay'-sound (hate) mid front
  - [æ] 'a'-sound (hat) low front

Rounding

- Rounded: lips are rounded when vowel is made
  - [u] 'oo'-sound (hoot) high back rounded
  - [o] 'oh'-sound (hope) mid back rounded
  - [ɔ] 'aw'-sound (caught) mid back rounded
- Unrounded: lips are not rounded when vowel is made
  - [i] 'ee'-sound (heat) high front unrounded
  - [e] 'ay'-sound (hate) mid front unrounded
  - [æ] 'a'-sound (hat) low front unrounded
  - [ɑ] 'ah'-sound (hot) low back unrounded

Tenseness

- Tense Vowels ('heat', 'sale')
  - Pronounced with greater 'tensing' of the tongue
  - Tongue is closer to roof of the mouth
  - Pronounced with greater duration (length)
- Lax Vowels ('hit', 'sell')
  - Pronounced with less 'tensing' of the tongue
  - Tongue is further from roof of the mouth
  - Pronounced with less duration (length)
- Tense Vowels
  - [i] 'ee'-sound (heat) high, front , unrounded, tense
  - [e] 'ay'-sound (hate) mid, front , unrounded, tense
  - [u] 'oo'-sound (hoot) high, back , rounded, tense
  - [o] 'oh'-sound (hope) mid, back, rounded, tense
  - [ɑ] 'ah'-sound (hot) low, back, unrounded, tense
- Lax Vowels
  - [ɪ] 'i'-sound (hit) high, front, unrounded, lax
  - [ɛ] 'e'-sound (sell) mid, front, unrounded, lax

- [æ] 'a'-sound (hat) low, front, unrounded, lax
- [ɨ] 'uh'-sound (roses) high, central, unrounded, lax
- [ə] 'uh'-sound (sofas) mid, central, unrounded lax
- [ʌ] 'uh'-sound (cut) low, central, unrounded, lax
- [ʊ] 'u'-sound (put) high, back, rounded, lax
- [ɔ] 'aw'-sound (caught) mid, back, rounded, lax

Dipthongs

ABOVE WE DISCUSSED **pure vowels**, where there is no change in vowel quality during the segment. English contains another type of vowel called a **dipthong**, which is a vowel which shows a noticeable change in quality. Compare 'bah', 'bee', 'boo' with 'buy', 'boy', 'bow' (of a ship).

Major Dipthongs

- [aj] 'eye'-sound eye, lie, buy, rye, etc.
- [aw] 'ow'-sound now, how, bow, loud etc.
- [ɔj] 'oy'-sound boy, toy, joy, Freud etc

Minor Dipthongs

There are two other dipthongs. The sounds [e] as in 'hate' and [o] as in 'hope' are actually dipthongs!

- [ej] 'ay'-sound lay, bay, etc.
- [oj] 'o'-sound low, bow (and arrow), know, etc.

IPA Practice

Practice Problems

1. What is the English equivalent of the following IPA symbols?

   [fənɑlədʒɨsts mʌst kip ðejɹ iɹz spɛktækjuliɹli klin]

2. What is the English equivalent of the following IPA symbols?

   [ju majt fajnd ðə ɑn lajn klæs wɛbsajt hɛlpfʌl]

Practice Problems

3. What are the IPA symbols for the following English sentence?

   Sabrina Carpenter is a female pop singer

4. What are the IPA symbols for the following English sentence?

   Fall is the best season of the year

Syllables: The Basics

For the sections on syllables I draw on Prof. Claire Moore-Cantwell's Linguistics 2010Q from University of Connecticut.

WE HAVE MADE REFERENCE TO SYLLABLES a number of times in this class, notably with Expletive Insertion. The aim here is to formalize these notions a bit and discuss what counts as a possible English word.

Syllables are comprised of:

- **Onset**: the consonants that begin a syllable
- **Nucleus**: the sound in the middle of a syllable (typically a vowel)
- **Coda**: the consonants that end a syllable

Consonants and vowels sit on a spectrum from non-sonorant (meaning quiet or non-prominent) to sonorant (meaning loud or prominent):

Sonority Scale

stops/plosives < affricates < fricatives < nasals < approximants < vowels

- In onsets, sonority often increases into the nucleus
- In codas, sonority often decreases away from the nucleus
- The nucleus is the most prominent part of the syllable

To build a syllable you can follow this simple algorithm:

1. Find the nucleus
2. Find the onset (make it as large as possible, called Onset Maximization)
3. Find the coda
4. Coda + Nucleus is called the Rime
5. The Rime combines with the onset to form the syllable

Phonotactics

NOT ALL SEQUENCES OF SEGMENTS ARE PERMISSIBLE in a given language. Syllables play a large role in defining phonotactics as languages target them. These phonotactic constraints are often arbitrary, though there are some general patterns. Some fun cross-linguistic generalizations include:

- No language allows only V syllables (syllables of only vowels; e.g., you need to use consonants somewhere)

- Many languages allow only syllables of the form V or CV (e.g., no codas)
- Many languages allow only simple onsets and codas, like V, CV, VC, CVC
- Onsets can be up to 6 consonants long (Georgian, Armenian)
- Codas can be up to 4 consonants long (Russian, Slovak)
- All languages allow vowels to be nucleii, but some languages allow consonants (including voiceless stops; Berber, Oowekyala)

Below is a representative sampling of monosyllabic English words.

[ðə]	[splej]	[spaj]
[m]	[tɹej]	[ləɹm]
[ə]	[stɹej]	[ləɹmd]
[frej]	[smæk]	[θəɹst]
[θɹi]	[snæk]	[θəɹsts]
[twɪm]	[slæk]	[lɛŋkθ]
[plej]	[ski]	[lɛŋkθs]

Question

Based on the data above:

1. How small can onsets be? How big can onsets be?
2. How small can codas be? How big can codas be?
3. What are some exceptions to the general tendencies of syllables?

Question

Consider the following Japanese word:

[bisuketo] 'biscuit'

What can you glean about the phonotactics of Japanese?

Practice

Question

1. In at least American English, which is West Germanic language spoken by approximately 246 million speakers, some vowels are long (in duration; marked with ‘ː’) while others are short. Are long and short vowels allophones of the same phonemes or different phonemes? If they are allophones of the same phoneme, provide a phonological rule to account for their distribution.

‘ride’	[ɹaːjd]	‘right’	[ɹajt]	‘rye’	[ɹaj]
‘aid’	[eːjd]	‘ate’	[ejt]	‘bay’	[bej]
‘lobe’	[loːwb]	‘lope’	[lowp]	‘low’	[low]
‘teethe’	[tʰiːð]	‘teeth’	[tʰiθ]	‘tea’	[tʰi]
‘save’	[seːjv]	‘safe’	[sejf]	‘say’	[sej]

Before Next Class

- Reading and pre-class quiz
- Make progress on the first report