

Phonetics II

Andrew Murphy
andrew.murphy@uChicago.edu

Week 2

04.04.22

LING 20001: Introduction to Linguistics

- There are three main ways we can characterize speech sounds:

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation:**

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**:

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**:

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**: e.g. stop, fricative, approximant

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**: e.g. stop, fricative, approximant
- For a sound like **t** in **t**ree, we can give it a label:

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**: e.g. stop, fricative, approximant
- For a sound like **t** in **t**ree, we can give it a label:
- **Voiceless alveolar stop**

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**: e.g. stop, fricative, approximant
- For a sound like **t** in **t**ree, we can give it a label:
- **Voiceless alveolar stop**
- But this gets tedious. We want a shorter way of describing this sound.

- There are three main ways we can characterize speech sounds:
 - ★ **Phonation**: voiced/voiceless
 - ★ **Place of articulation**: e.g. bilabial, labiodental, alveolar, post-alveolar, velar, glottal
 - ★ **Manner of articulation**: e.g. stop, fricative, approximant
- For a sound like **t** in **t**ree, we can give it a label:
- **Voiceless alveolar stop**
- But this gets tedious. We want a shorter way of describing this sound.
- This is where transcription comes in!

Pronunciation ≠ orthography!

*I take it you already know
of **tough** and **bough** and **cough** and **dough**?
Others may stumble, but not you
On **hiccough**, **thorough**, **slough**, and **through**?
Well done! And now you wish, perhaps
To learn of less familiar traps?*

T.S. Watt (1954)

Pronunciation ≠ orthography!

Spelling <ough> Pronunciation

'bought'

'o' in 'spot'

'rough'

'uff' in 'fluff'

'hiccough'

'up'

'through'

'oe' in 'shoe'

'cough'

'off'

'dough'

'oh'

'plough'

'ow' in 'power'

International Phonetic Alphabet

The most widely accepted phonetic alphabet is the **International Phonetic Alphabet**, or IPA.

International Phonetic Alphabet

The most widely accepted phonetic alphabet is the **International Phonetic Alphabet**, or IPA.

This set of symbols is designed to make it possible for linguists to give a more precise description of sounds from any language in the world.

International Phonetic Alphabet

THE INTERNATIONAL PHONETIC ALPHABET (2005)

CONSONANTS (PULMONIC)

	LABIAL		CORONAL				DORSAL			RADICAL		LARYNGEAL
	Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Epi-glottal	Glottal
Nasal	m	ɱ	n				ɳ	ɲ	ŋ	ɴ		
Plosive	p b	ɸ β	t d				ʈ ɖ	c ɟ	k ɡ	q ɢ	ʔ	ʔ
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	ħ ʕ	h ɦ
Approximant		ʋ	ɹ				ɻ	j	ɰ			
Trill	ʙ		r						ʀ		ʀ	
Tap, Flap		ⱱ	ɾ				ɽ					
Lateral fricative			ɬ ɮ			ɮ	ɬ	ɮ				
Lateral approximant			l			ɭ	ʎ	ʎ				
Lateral flap			ɺ			ɻ						

Where symbols appear in pairs, the one to the right represents a modally voiced consonant, except for murmured *ɦ*. Shaded areas denote articulations judged to be impossible. Light grey letters are unofficial extensions of the IPA.

CONSONANTS (NON-PULMONIC)

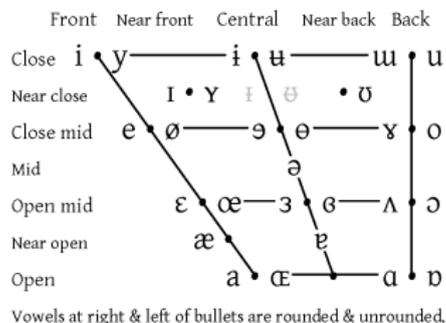
Anterior click releases (require posterior stops)	Voiced implosives	Ejectives
⦿ Bilabial fricated	ɓ Bilabial	ʼ <i>Examples:</i>
ɮ Laminar alveolar fricated ("dental")	ɗ Dental or alveolar	ɓ' Bilabial
ɠ Apical (post)alveolar abrupt ("retroflex")	ɲ Palatal	ɗ' Dental or alveolar
ɠ Laminar postalveolar abrupt ("palatal")	ɣ Velar	ɲ' Velar
ɠ Lateral alveolar fricated ("lateral")	ʄ Uvular	ɣ' Alveolar fricative

CONSONANTS (CO-ARTICULATED)

ɱ	Voiceless labialized velar approximant
ɰ	Voiced labialized velar approximant
ɰ	Voiced labialized palatal approximant
ɕ	Voiceless palatalized postalveolar (alveolo-palatal) fricative
ʐ	Voiced palatalized postalveolar (alveolo-palatal) fricative
ɧ	Simultaneous x and f (disputed)
kp ts	Affricates and double articulations may be joined by a tie bar

International Phonetic Alphabet

VOWELS



SUPRASEGMENTALS

- ' Primary stress
 - '' Extra stress
 - ˌ Secondary stress [ˌfoʊnəˈtʃən]
 - e: Long
 - eː Half-long
 - e Short
 - ě Extra-short
 - Syllable break
 - ˘ Linking (no break)
- ### INTONATION
- | Minor (foot) break
 - || Major (intonation) break
 - ↗ Global rise
 - ↘ Global fall

TONE

- ### Level tones
- é ˩ Top
 - é ˨ High
 - ē ˩ Mid
 - è ˩ Low
 - è ˩ Bottom
- ### Contour-tone examples:
- ě ˩ ↗ Rising
 - ê ˩ ↘ Falling
 - ē ˩ ↗ High rising
 - è ˩ ↗ Low rising
 - è ˩ ↘ High falling
 - ē ˩ ↘ Low falling
 - ē ˩ ↗ Peaking
 - ē ˩ ↘ Dipping
- ### Tone terracing
- ↑ Upstep
 - ↓ Downstep

DIACRITICS

Diacritics may be placed above a symbol with a descender, as ɲ̣. Other IPA symbols may appear as diacritics to represent phonetic detail: t̚ (fricative release), bʰ (breathy voice), ʔ (glottal onset), ə̤ (epenthetic schwa), o̤ (diphthongization).

SYLLABICITY & RELEASES		PHONATION		PRIMARY ARTICULATION		SECONDARY ARTICULATION			
ɲ̩ ɳ̩	Syllabic	ɲ̥ ɳ̥	Voiceless or Slack voice	t̪ b̪	Dental	tʷ dʷ	Labialized	ɔ̠ ɣ̠	More rounded
e̞ ɔ̞	Non-syllabic	ʂ̺ ɖ̺	Modal voice or Stiff voice	t̺ d̺	Apical	tʲ dʲ	Palatalized	ɔ̠ ɣ̠ʷ	Less rounded
tʰ ht̚	(Pre)aspirated	ɲ̤ ɳ̤	Breathy voice	t̺ d̺	Laminal	tʷ dʷ	Velarized	ẽ ʒ̃	Nasalized
d̚	Nasal release	ɲ̤ ɳ̤	Creaky voice	ɯ̟ t̟	Advanced	t̟ d̟	Pharyngealized	ɤ̟ ɔ̟	Rhoticity
d̚	Lateral release	ɲ̤ ɳ̤	Strident	ɨ̟ t̟	Retracted	t̟ z̟	Velarized or pharyngealized	ɛ̟ ɔ̟	Advanced tongue root
t̚	No audible release	ɲ̤ ɳ̤	Linguolabial	ä̟ j̟	Centralized	ũ̟	Mid-centralized	ɛ̟ ɔ̟	Retracted tongue root
e̞̟ β̞̟	Lowered (β̞̟ is a bilabial approximant)			e̞̟ ɹ̞̟	Raised (ɹ̞̟ is a voiced alveolar non-sibilant fricative, ɹ̞̟ a fricative trill)				

Interactive version: [URL](#)

Consonants in the IPA

The IPA organizes consonants according to three primary dimensions of variation:

	Bilabial
Nasal	m
Plosive	p b

place of articulation

manner of articulation

glottal state

Consonants of English

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Glottal
Nasal	m		n					ŋ		
Plosive	p b		t d					k g		ʔ
Fricative		f v	θ ð	s z	ʃ ʒ					h
Approximant			ɹ				j			
Trill										
Tap, Flap			ɾ							
Lateral fricative										
Lateral approximant			l							
Lateral flap										

Consonants of English

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Glottal
Nasal	m		n					ŋ		
Plosive	p b		t d					k g		ʔ
Fricative		f v	θ ð	s z	ʃ ʒ					h
Approximant			ɹ				j			
Trill										
Tap, Flap			ɾ							
Lateral fricative										
Lateral approximant			l							
Lateral flap										

Why is **w** not here?

Consonants of English

	Bilabial	Labio-dental	Dental	Alveolar	Post-alveolar	Retroflex	Palatal	Velar	Uvular	Glottal
Nasal	m		n					ŋ		
Plosive	p b		t d					k g		ʔ
Fricative		f v	θ ð	s z	ʃ ʒ					h
Approximant			ɹ				j			
Trill										
Tap, Flap			ɾ							
Lateral fricative										
Lateral approximant			l							
Lateral flap										

Why is **w** not here? It is a **voiced labio-velar approximant** ([w])

Consonants in the IPA

When we write a phonetic transcription, i.e., how a sound or word is pronounced, we'll enclose it in **[square brackets]** so we know to interpret the symbols in the phonetic alphabet

Consonants in the IPA

When we write a phonetic transcription, i.e., how a sound or word is pronounced, we'll enclose it in **[square brackets]** so we know to interpret the symbols in the phonetic alphabet

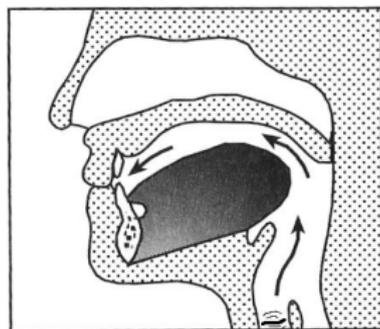
When describing the properties of a consonant, we must make reference to **glottal state**, **place** of articulation, and **manner** of articulation (in that order)

Consonants in the IPA

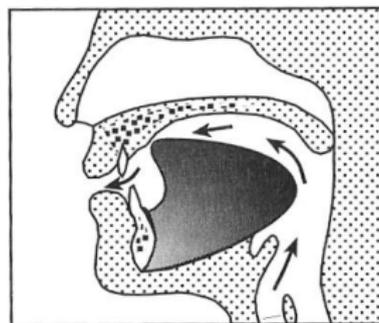
When we write a phonetic transcription, i.e., how a sound or word is pronounced, we'll enclose it in **[square brackets]** so we know to interpret the symbols in the phonetic alphabet

When describing the properties of a consonant, we must make reference to **glottal state**, **place** of articulation, and **manner** of articulation (in that order)

e.g. [b] is a voiced bilabial stop, [s] is a voiceless alveolar fricative



[b]



[s]

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. **[b]**ill, s**[p]**ill, **[d]**ill, s**[t]**ill, **[g]**ill, s**[k]**ill, **[v]**an, **[f]**an, **[m]**oon, **[n]**oon, **[h]**ill

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. [b]ill, s[p]ill, [d]ill, s[t]ill, [g]ill, s[k]ill, [v]an, [f]an, [m]oon, [n]oon, [h]ill
- A few sounds have corresponding symbols that aren't part of English orthography:

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. **[b]**ill, s**[p]**ill, **[d]**ill, s**[t]**ill, **[g]**ill, s**[k]**ill, **[v]**an, **[f]**an, **[m]**oon, **[n]**oon, **[h]**ill
- A few sounds have corresponding symbols that aren't part of English orthography:

thigh **[θ]**

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. [b]ill, s[p]ill, [d]ill, s[t]ill, [g]ill, s[k]ill, [v]an, [f]an, [m]oon, [n]oon, [h]ill
- A few sounds have corresponding symbols that aren't part of English orthography:

thigh	[θ]
thy	[ð]

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. **[b]**ill, s**[p]**ill, **[d]**ill, s**[t]**ill, **[g]**ill, s**[k]**ill, **[v]**an, **[f]**an, **[m]**oon, **[n]**oon, **[h]**ill
- A few sounds have corresponding symbols that aren't part of English orthography:

th igh	[θ]
th y	[ð]
sh y	[ʃ]

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. **[b]**ill, s**[p]**ill, **[d]**ill, s**[t]**ill, **[g]**ill, s**[k]**ill, **[v]**an, **[f]**an, **[m]**oon, **[n]**oon, **[h]**ill
- A few sounds have corresponding symbols that aren't part of English orthography:

th igh	[θ]
th y	[ð]
sh y	[ʃ]
gar age	[ʒ]

Consonants of English: Stops & Fricatives

- Many IPA symbols for consonants correspond to English orthography:
- e.g. **[b]**ill, s**[p]**ill, **[d]**ill, s**[t]**ill, **[g]**ill, s**[k]**ill, **[v]**an, **[f]**an, **[m]**oon, **[n]**oon, **[h]**ill
- A few sounds have corresponding symbols that aren't part of English orthography:

th igh	[θ]
th y	[ð]
sh y	[ʃ]
gar ag e	[ʒ]
si ng	[ŋ]

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]

judge [dʒ]

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]

judge [dʒ]

- These are known as **affricates**.

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]

judge [dʒ]

- These are known as **affricates**.
- Another English sound with a different manner of articulation is the **(voiced) alveolar tap** or **flap**.

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]

judge [dʒ]

- These are known as **affricates**.
- Another English sound with a different manner of articulation is the **(voiced) alveolar tap** or **flap**.
- This sound is produced when the tongue briefly strikes the alveolar ridge as it passes across.

butter [ɾ]

bidder [ɾ]

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]
judge [dʒ]

- These are known as **affricates**.
- Another English sound with a different manner of articulation is the **(voiced) alveolar tap** or **flap**.
- This sound is produced when the tongue briefly strikes the alveolar ridge as it passes across.

but**ter** [ɾ]
bi**dder** [ɾ]

- In American English, this sound occurs between vowels.

Consonants of English: Affricates & Taps

- English also has sequences of stops followed by fricatives.

church [tʃ]

judge [dʒ]

- These are known as **affricates**.
- Another English sound with a different manner of articulation is the **(voiced) alveolar tap** or **flap**.
- This sound is produced when the tongue briefly strikes the alveolar ridge as it passes across.

butter [ɾ]

bidder [ɾ]

- In American English, this sound occurs between vowels.
- In some dialects of British English, it is a glottal stop [ʔ]

Consonants of English: Approximants

Consonants of English: Approximants

young [j]

Consonants of English: Approximants

young [j]
_utility [j]

Consonants of English: Approximants

y oung	[j]
_ utility	[j]
w inner	[w]

Consonants of English: Approximants

y oung	[j]
_ utility	[j]
w inner	[w]
l ove	[l]

Consonants of English: Approximants

y oung	[j]
_ utility	[j]
w inner	[w]
l ove	[l]
ll bell	[ɫ]

Consonants of English: <r>

English <r>

Consonants of English: <r>

English <r>

- The IPA symbol [ɹ] corresponds to a sound not found in standard English.

Consonants of English: <r>

English <r>

- The IPA symbol [r] corresponds to a sound not found in standard English.
- It is an alveolar trill (a series of taps in quick succession), e.g. Spanish **perro** 'dog' ([r]).

Consonants of English: <r>

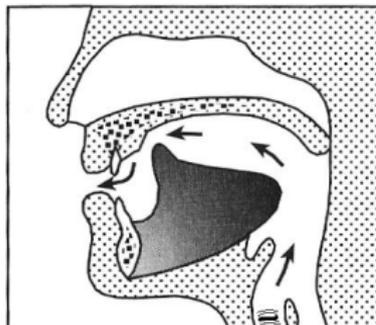
English <r>

- The IPA symbol [r] corresponds to a sound not found in standard English.
- It is an alveolar trill (a series of taps in quick succession), e.g. Spanish **perro** 'dog' ([r]).
- English <r> is as an **alveolar approximant**, e.g. red → [ɹ]

Consonants of English: <r>

English <r>

- The IPA symbol [ɾ] corresponds to a sound not found in standard English.
- It is an alveolar trill (a series of taps in quick succession), e.g. Spanish **perro** 'dog' ([ɾ]).
- English <r> is as an **alveolar approximant**, e.g. **red** → [ɹ]

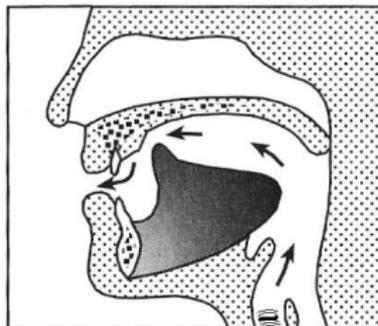


[ɾ]

Consonants of English: <r>

English <r>

- The IPA symbol [r] corresponds to a sound not found in standard English.
- It is an alveolar trill (a series of taps in quick succession), e.g. Spanish **perro** 'dog' ([r]).
- English <r> is as an **alveolar approximant**, e.g. **red** → [ɹ]

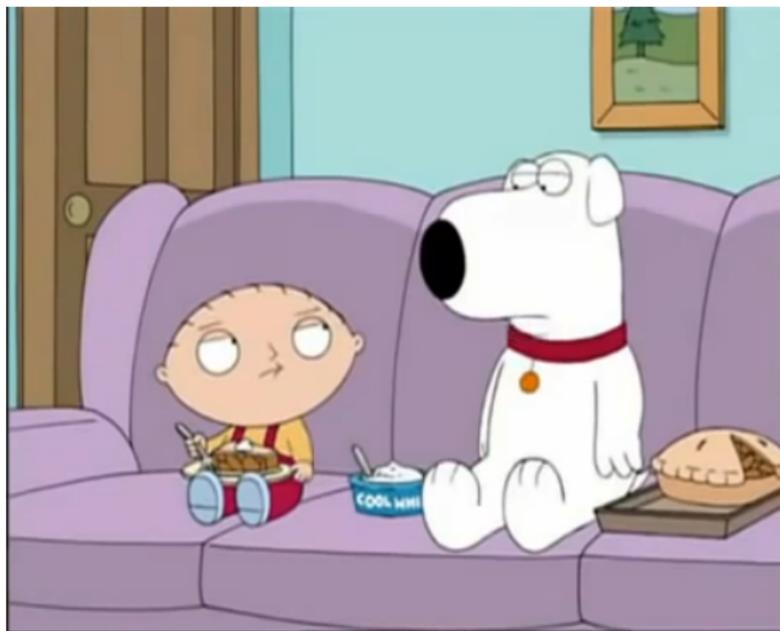


[ɹ]

- Don't confuse this symbol with the alveolar tap [ɾ]!

Cool whip





“Why are you putting so much emphasis on the ‘h’?”



“Why are you putting so much emphasis on the ‘h?’” **There is no ‘h!’**



“Why are you putting so much emphasis on the ‘h’?” **There is no ‘h’!**

It is a **voiceless labio-velar fricative** [ɸ] or **approximant** [ɰ]!

Approximants vs. Vowels?



Approximants vs. Vowels?



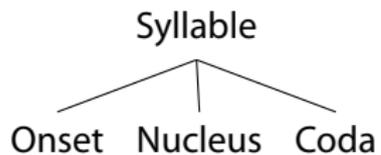
Why is 'y' sometimes a vowel?

Syllable structure

- Syllables have a basic structure:

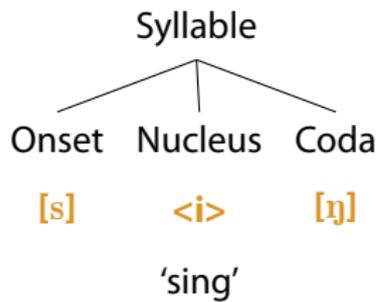
Syllable structure

- Syllables have a basic structure:



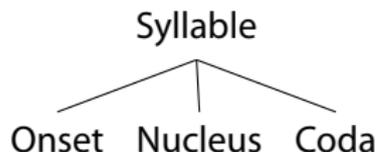
Syllable structure

- Syllables have a basic structure:



Syllable structure

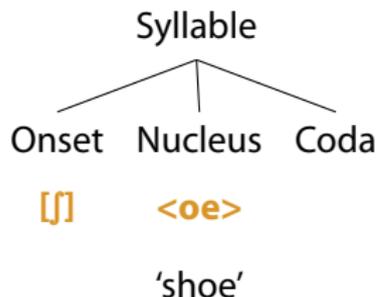
- Syllables have a basic structure:



- The onset and coda do not necessarily have to be filled.

Syllable structure

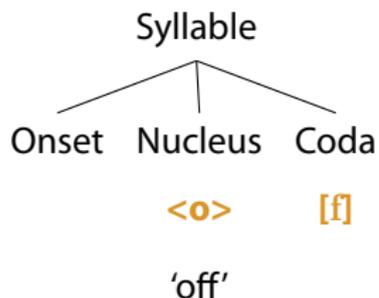
- Syllables have a basic structure:



- The onset and coda do not necessarily have to be filled.

Syllable structure

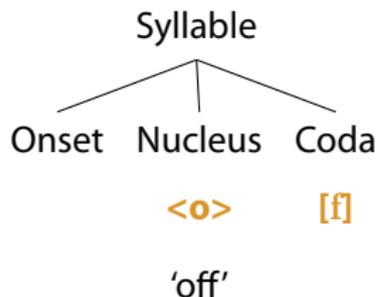
- Syllables have a basic structure:



- The onset and coda do not necessarily have to be filled.

Syllable structure

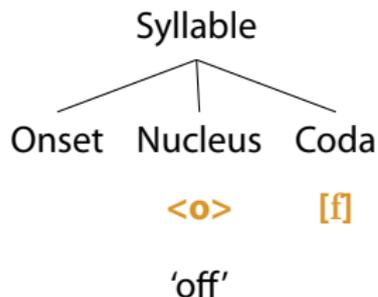
- Syllables have a basic structure:



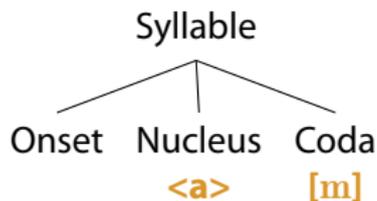
- The onset and coda do not necessarily have to be filled.
- How many syllables in the word *ambitious*?

Syllable structure

- Syllables have a basic structure:

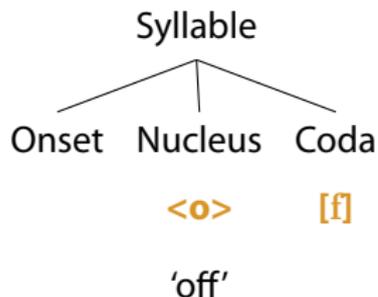


- The onset and coda do not necessarily have to be filled.
- How many syllables in the word *ambitious*?

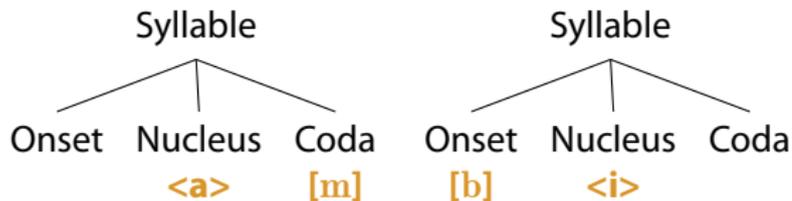


Syllable structure

- Syllables have a basic structure:

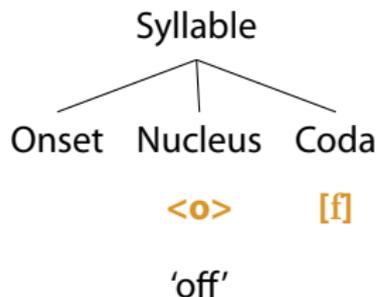


- The onset and coda do not necessarily have to be filled.
- How many syllables in the word *ambitious*?

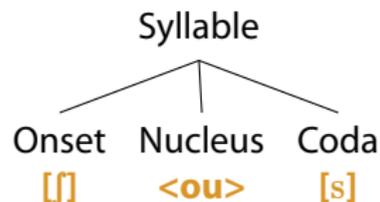
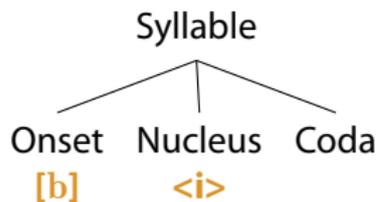
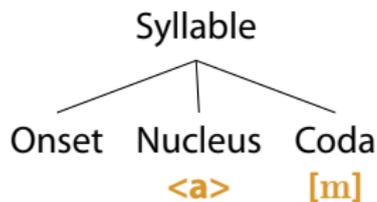


Syllable structure

- Syllables have a basic structure:



- The onset and coda do not necessarily have to be filled.
- How many syllables in the word *ambitious*?

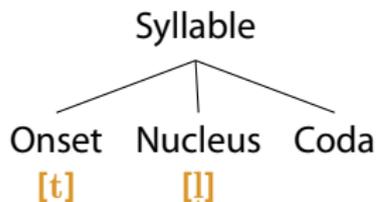
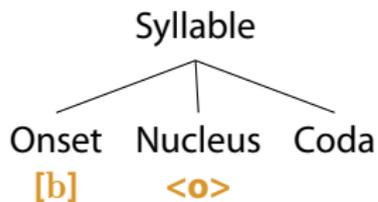


Syllabic consonants

- How many syllables in the word *bottle*?

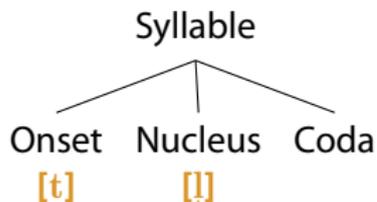
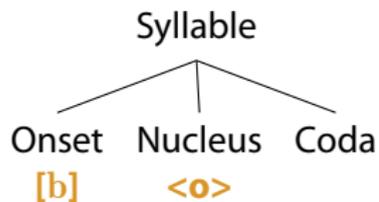
Syllabic consonants

- How many syllables in the word *bottle*?



Syllabic consonants

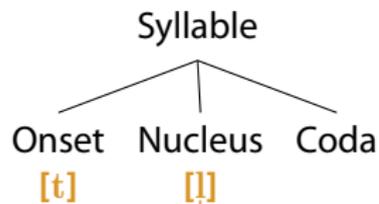
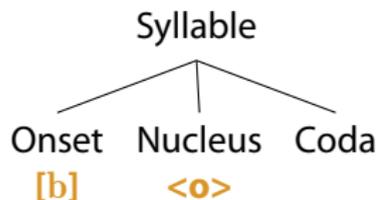
- How many syllables in the word *bottle*?



- The <l> is **syllabic**: [b<o>t̥]

Syllabic consonants

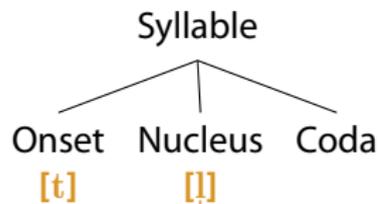
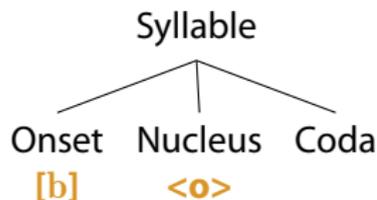
- How many syllables in the word *bottle*?



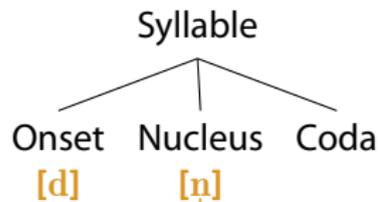
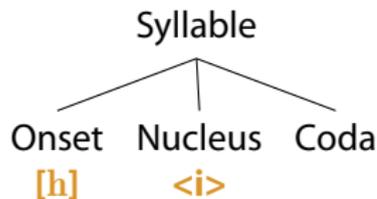
- The <l> is **syllabic**: [b<o>t_l]
- How many syllables in the word *hidden*?

Syllabic consonants

- How many syllables in the word *bottle*?

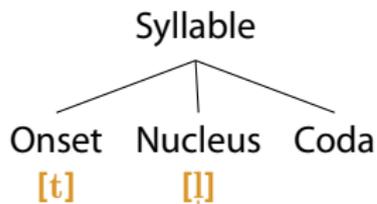
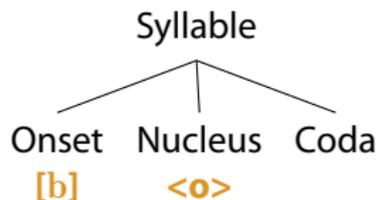


- The <l> is **syllabic**: [b<o>tɫ]
- How many syllables in the word *hidden*?

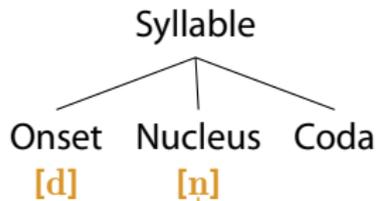
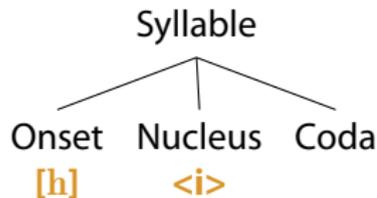


Syllabic consonants

- How many syllables in the word *bottle*?



- The <l> is **syllabic**: [b<o>tɫ̩]
- How many syllables in the word *hidden*?



- The <n> is **syllabic**: [h<i>dɲ̩]

Non-syllabic vowels

- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'

Non-syllabic vowels

- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'

Non-syllabic vowels

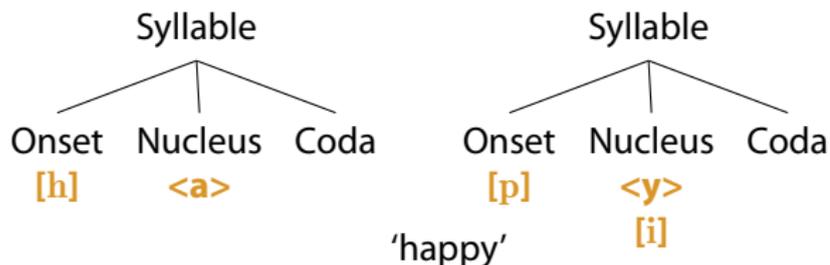
- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'.
- Why is <y> sometimes a vowel?

Non-syllabic vowels

- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'.
- Why is <y> sometimes a vowel?
- The same vowel the <y> in 'happy' and 'feet' ([i]) is transcribed as [j] when it is non-syllabic (i.e. not the nucleus of the syllable).

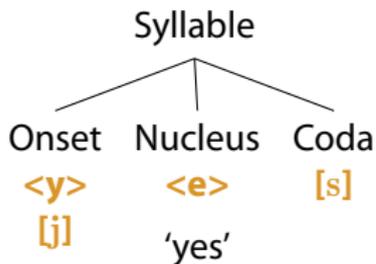
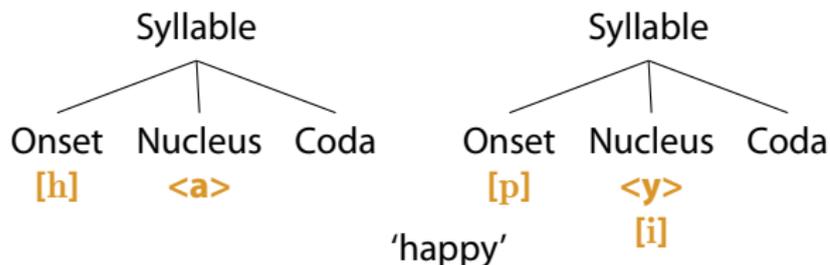
Non-syllabic vowels

- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'.
- Why is <y> sometimes a vowel?
- The same vowel the <y> in 'happy' and 'feet' ([i]) is transcribed as [j] when it is non-syllabic (i.e. not the nucleus of the syllable).



Non-syllabic vowels

- Returning approximants like [j] and [w], we can now understand what it means for them to be 'semi-vowels'.
- Why is <y> sometimes a vowel?
- The same vowel the <y> in 'happy' and 'feet' ([i]) is transcribed as [j] when it is non-syllabic (i.e. not the nucleus of the syllable).

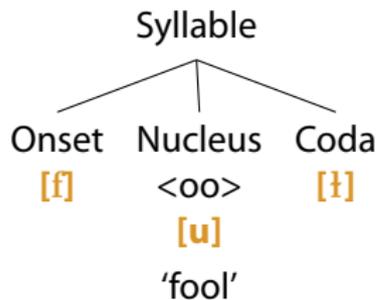


Non-syllabic vowels

- By the same token, we should actually also treat <w> as a non-syllabic vowel!

Non-syllabic vowels

- By the same token, we should actually also treat <w> as a non-syllabic vowel!



Non-syllabic vowels

- By the same token, we should actually also treat <w> as a non-syllabic vowel!

