

Review for Midterm

SPAU 3343

Updated Spring, 2014

IPA

- International Phonetic Alphabet.
- Each symbol represents a single sound.
- We can transcribe any sound of any language with IPA.

Linguistics

- The scientific study of language.

Phonetics

- Part of linguistics. The scientific study of speech sound.
 - Articulatory phonetics: How speech sounds are articulated. → Description and classification of speech sounds.
 - Acoustic phonetics: How speech sounds are generated and how they are transmitted. → The relationship between articulation and acoustic output.
 - Auditory phonetics: How human ears perceive speech sounds.

Phonology

- How speech sounds are used in languages.
- Study of systems of speech sounds and the rules which govern them

Speech sounds

- Sounds are not the same things as orthography.
- The IPA was created to represent actual speech sounds.
- IPA was designed to consider grouping of sounds.
 - Voiced/voiceless
 - Place of articulation
 - Manner of articulation
- Sounds change based on speech context

Phone

- An individual sound of speech; an elementary sound unit.

Phoneme

- The smallest sound unit in a language that distinguishes word meanings.



Minimal pair

- Two words that have exactly the same phonemes except one.
- Minimal pairs are useful for determining which sounds are phonemes in a language.
- EXAMPLES: /pit/ - /bit/
• /pit/ - /pæt/

Vowels – tense, lax

- **Tense vowels** - occur in words with a final so-called silent “e” in the spelling (e.g., “mate”, “mete”, “kite”, and “cute”). These vowels **CAN** occur in open syllables (V, CV, CCV, etc.)
- **Lax vowels** - occur in the words without a “silent e” such as “mat”, “met”, “kit” and “cut”. These vowels **CANNOT** occur in open syllables, but are only found in closed syllables.

Vowels – tense, lax

 Tense Vowels	 Lax Vowels	Most Closed Syllables	Open Syllables	Syllables Closed by [r]	Syllables Closed by [ŋ]	Syllables Closed by [ʃ]
i:		beat	bee	beer		(leash)
	ɪ	bit			sing	wish
eɪ		bait	bay			
	ɛ	bet		bare	length	fresh
	æ	bat			hang	crash
ɑ:		hot	pa	bar		slosh
ɔ:		bought	saw	bore	long	(wash)
oʊ		boat	low	(boar)		
	ʊ	good				push
u:		boot	boo	poor		
	ʌ	but			hung	crush
aɪ		bite	buy	fire		
aʊ		bout	bough	hour		
ɔɪ		void	boy	(coir)		
ju		cute	cue	pure		

Allophone – []

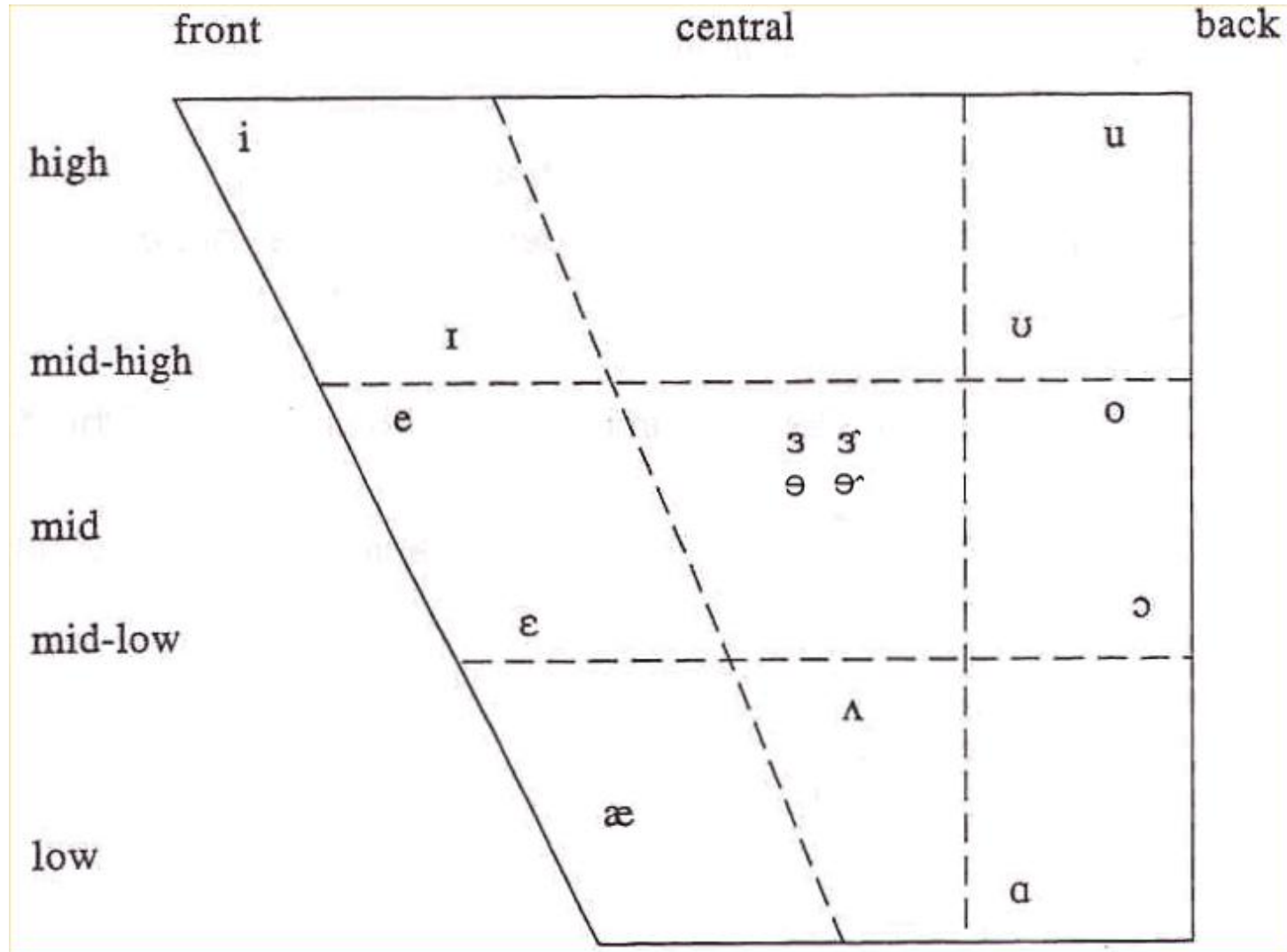
- A variant of a phoneme. The allophones of a phoneme form a set of sounds that:
 - Do not change the meaning of a word,
 - Are all very similar to one another, and
 - Occur in phonetic contexts different from one another (for example, syllable-initial as opposed to syllable-final).
- The differences among allophones can be stated in terms of phonological rules.

Consonants of GAE

Manner	Voicing		Place of Articulation							
	voiced (+)	voiceless (-)	Bilabial	Labio-Dental	Dental	Alveolar	Palato-Alveolar	Palatal	Velar	Glottal
Stop (nasal)	+		ɱ			ɲ			ŋ	
Stop (oral)		-	p			t			k	
Stop (oral)	+		b			d			g	
Fricative		-		f	θ	s	ʃ			h
Fricative	+			v	ð	z	ʒ			
Affricate		-					tʃ			
Affricate	+						dʒ			
Approximant	+					ɹ		j	w hw	
(lateral)	+					l			ɫ	

Also: /ʔ/, /r/

GAE Vowel Quadrilateral



Monophthongs vs. Diphthongs

Monophthongs

- A vowel in which there is no appreciable change in quality during a syllable, as in “father.”

Diphthongs

- A vowel in which there is a change in quality during a single syllable, as in “high.”

Diphthongs

/aɪ/

/ɔɪ/

/aʊ/

Tense vowels with a little bit of offglide
But these are not full diphthongs.

/e/ = /e/

/i/ = /ij/

/o/ = /ou/

/u/ = /uw/

Diphthong /aɪ/

- As in “*high, buy*,” moves toward a high front vowel, but in most forms of English it does not go much beyond a mid front vowel.

Diphthong /aʊ/

- As in “**how**”
- Usually starts with a very similar quality to that at the beginning of “**high**”

Diphthong /ɔɪ/

- As in “**boy**”

Connected speech

- The way we talk daily.
- Our talk is “connected” because we do not separate each word as we talk.
- Connected speech is not like citation form.

Citation form

- Citation form is a teacher type of talk. Each word is articulated separately.
- We rarely talk in citation form.

Feature theory

Markedness – mark only unusual cases

- Voicing, place and manner →
Consonants are assumed to be:
 - **Central instead of lateral** → Therefore, “lateral” is a marked feature. You don’t have to mark “central.”
 - **Oral instead of nasal** → Therefore, “nasal” is marked. You don’t have to mark “oral.”

Binary vs. Graded Features

- **Binary features:**

- In a binary system, a state is either “on” or “off.” For example, “voiced” or “voiceless”.
- Binary codes are used for computers.
Binary features are:
 - Graspable
 - Intuitive

- **Graded features:**

- Like prosody (the melody of language), it cannot be explained by clear-cut binary features.

Coarticulation

- Coarticulation → Sounds before/after influence the next/previous sounds.
 - Anticipatory coarticulation → “look-ahead” → future sounds influence the present sound. When you say “I said ‘su’ again”, your mouth prepares for articulation of /u/ before it finishes producing /s/.
 - Perseverative coarticulation → “carryover” → previous sound still influences your present sound.
- Coarticulation is language dependent.
 - French speakers can anticipate 6 segments.
 - English speakers anticipate 1-2 segments.

Electropalatography (EPG)



- Subjects wear the unit on the upper surface of the mouths.
- Platinum electrodes record points of tongue contact.

Syllable

- A unit of speech consisting of either a single vowel (or a syllabic consonant) or a vowel and one or more consonants associated with it.
- The syllable is often used to describe patterns of stress and timing in speech.
 - Open syllable → starts with one or more consonants and ends with V
 - CV
 - Closed syllable → consonants at the end.
 - CVC, CVCC (etc.)

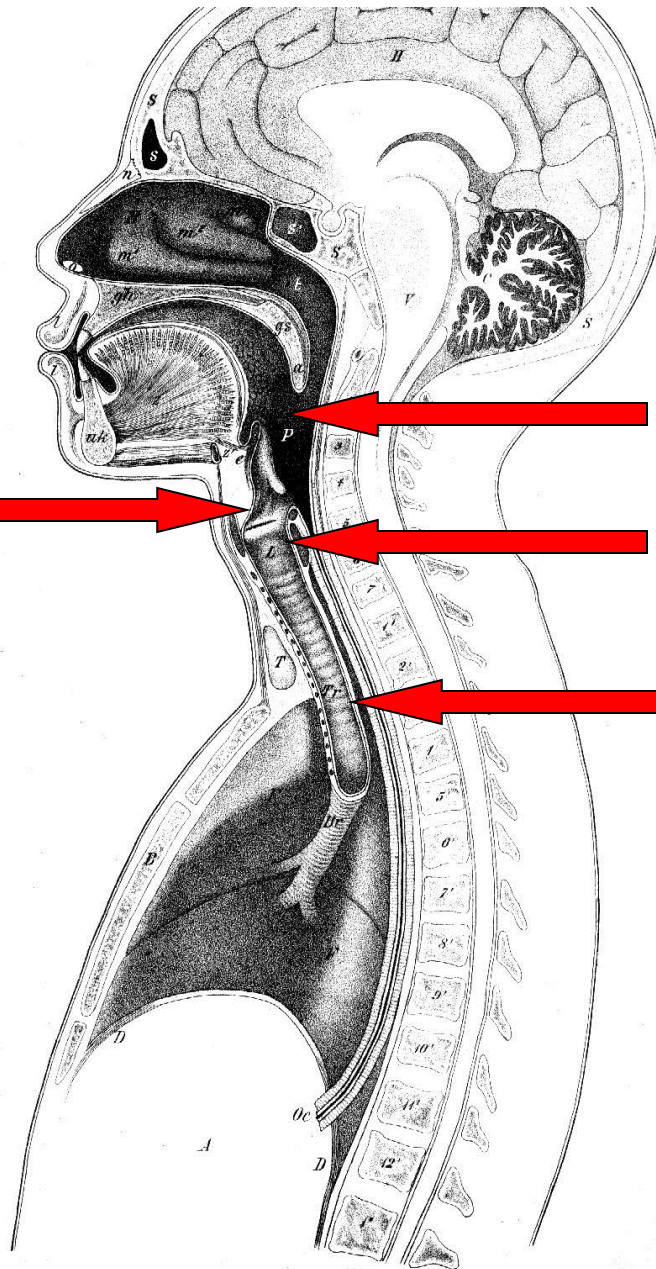
Diacritics

- A small mark that can be used to distinguish different values of an IPA symbol.
- For example, the addition of /~/ distinguishes a velarized from a non-velarized sound
- Try saying “ḷemon” and “pulḷ” to feel the different locations for producing the lateral sounds.
- For specific diacritics, refer to the pages about 12 phonological rules.

Source Filter Theory

- A theory in which energy from a source is modified by a set of filters.
- Source → The basic source of power for speech is the respiratory system pushing air out of the lungs.
- Filter → The larynx, pharynx, nasal cavity, and oral cavity (= supralaryngeal vocal tract)

Vocal Folds



Pharynx

Larynx

Trachea

Geminate consonant

- Long consonants that can be analyzed as double are called geminates.
- E.g. middle of Italian “folla”
- Careful: many English words are spelled with two consonants, but these are usually NOT geminates (e.g., “running”)

homorganic

- Two sounds that have the same place of articulation.
- For example, /d/ and /n/, as in English “hand,” are homorganic. They are both articulated on the alveolar ridge.

Transcription methods

- **Broad** → a transcription that uses a simple set of symbols.
- **Narrow** → Transcription that shows more phonetic detail, either just by using more specific symbols or by also representing some allophonic differences.
- **Phonemic** → A transcription made by using letters of the simplest possible shapes, and in the simplest possible number (generally goes with “broad”)
- **Systematic phonetic** → A transcription that shows the allophones in very detailed manners (generally goes with “narrow”)
- **Impressionistic** → A transcription that only indicates general phonetic value, e.g. when transcribing foreign, child, or disordered speech – the more impressionistic, the more broad.

Voice

- **Breathy voice** (murmur) → A type of phonation in which the vocal folds are only slightly apart so that they vibrate while allowing a high rate of airflow through the glottis, as in **Hindi** /b^h/ or /a̤/.
- **Creaky voice** (laryngealization) → A type of phonation in which the arytenoid cartilages hold the posterior end of the vocal folds together so that they can vibrate only at the other end, as in **Hausa** /a̰ /

Airstream mechanism

- **Airstream mechanism:** The manner in which an airstream is set in motion for the purposes of speech.
- Airstream mechanisms may produce **ingressive** (inward) or **egressive** (outward) airflow.
- An airstream mechanism consists of the movement of an initiator. Speech sounds are produced with one of three airstream mechanisms, or occasionally by a combination of two of these.

Airstream Mechanism

(pg. 239)

	Pulmonic	Glottalic	Velaric
Egressive	Plosives /p, t, k, b, d, g/	Ejectives /p', t', k'/	NONE
Ingressive	NONE	Implosives /ɓ, ɗ, ɠ/	Clicks /ǀ, ǁ, ǃ, ǂ/

Pulmonic, Glottalic and Velaric airstreams

Name	Initiator	Egressive	Ingressive
Pulmonic	lungs	most speech sounds	
Glottalic/Pharyngeal	closed glottis	ejectives	voiceless implosives
Velaric/Oral	velar closure		clicks
Pulmonic + Glottalic			voiced implosives

Ejective vs. Implosive sounds

- **Ejective** → A stop made with an egressive glottalic airstream, such as Hausa /t'/.
• **Implosive** → A stop made with an ingressive glottalic airstream, such as Sindhi /b/.

Different Languages

- Review the examples of languages discussed in class exemplary of interesting phonetic and linguistic features.
 - Language with click sounds → **!Xhosa**
 - Bilabial implosive → **Sindhi**
 - Ejective (glottal egressive airstream mechanism) stops → **Lakhota, Hausa**

How to describe vowels

Main classification

- Tongue height → high, mid, or low.
- Tongue advancement → front, central, or back.

Also, we talk about...

- Tenseness → tense or lax
- Lip rounding

Describing the vowels...

/i/ is a (high, mid, low)
(back, central, front) vowel.

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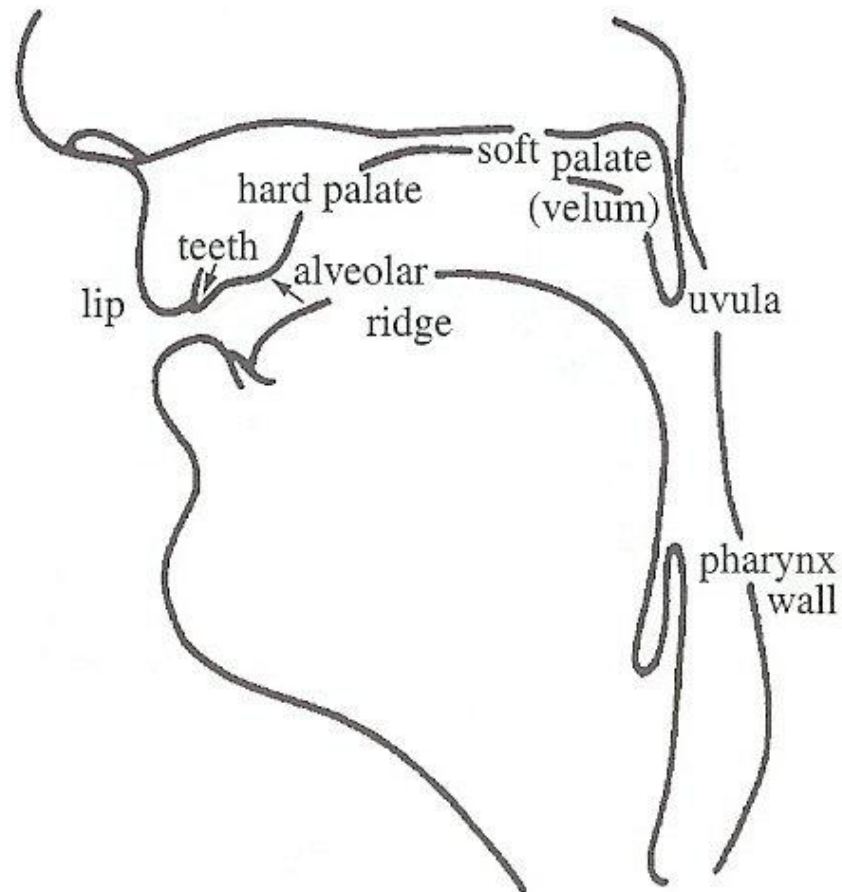
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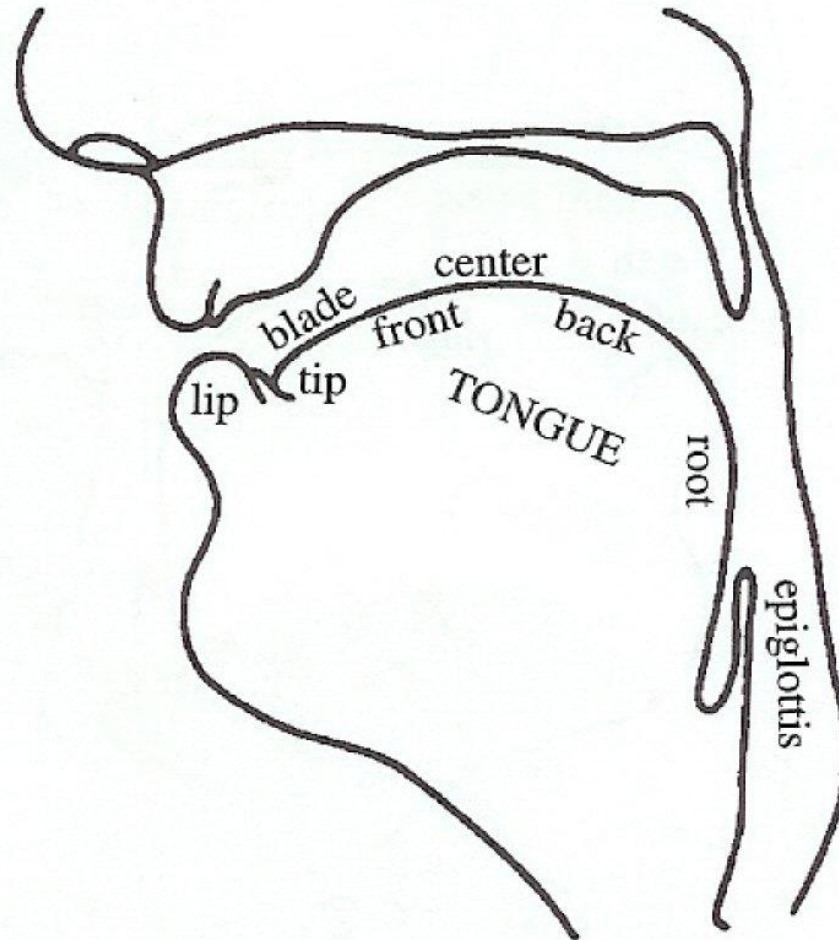
Describing the vowels...

/u/ is a (high, mid, low)
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Basic Speech Anatomy



Basic Speech Anatomy



Vocal Cord



- **Glottis** is the space between the vocal folds.
- **Vocal folds** are the two moving parts.

Stress placement

- The symbol /' / is a stress mark that has been placed before the syllable carrying the main stress.
- Stress should always be marked in words of more than one syllable.

Tone

- A pitch that conveys part of the meaning a word. In Chinese, for example, /ma/ pronounced with a high-level tone means “mother” and with a high falling tone means “scold.”
- Tones occur in relative balance of the sounds.

Two types of tone languages

1. **Register tone:** e.g., high/mid/low
2. **Contour tone:** include *rising*, *falling*, *dipping* (with slopes)

13 Phonological Rules

- Of English

Phonological Rule 1

Voiceless stops become aspirated when stressed and syllable initial.

- Diacritic: [h]
- Examples: [p^hɪt], [ən^hˈk^huθ]

Phonological Rule 2

Voiceless stops become unaspirated after /s/ at beginning of syllable.

- Diacritic: none
- Examples: [stue]

- Pg. 134 “Aspiration blocked by /s/”

Phonological Rule 3

Approximants become (partially) devoiced after aspirated stops.

- Diacritic: [◌̚]
- Examples: [p^h◌̚e]

Phonological Rule 4

Stops are unreleased before stops.

- Diacritic: [̚]
- Examples: [μɪsk̚t], [hʌm̚p]

•Pg. 136

Phonological Rule 5

Vowels are preceded by glottal stops at the start of an utterance

- Diacritic: [ʔ]
- Examples: [ʔiʔŋ], [ʔ_Δʔo]
- Pg. 137 “Glottal stopping at word beginning”

Phonological Rule 6

Voiceless stops are preceded by glottal stop after a vowel and at the end of a syllable. Also applies to syllable-final voiceless affricates.

- Diacritic: [ʔ]
- Examples: [stiʔp], [p^hIʔtʃ]
- Pg. 137 “Glottal stopping at word end”

Phonological Rule 7

Voiceless alveolar stops become glottal stops before a nasal in the same word.

- Diacritic: [ʔ]
- Examples: [ʔiʔŋ]

- Pg. 138 “Glottal stopping before nasals”

Phonological Rule 8

Alveolar stops (*note*: /t/ or /d/) become a voiced flap between a stressed vowel and an unstressed vowel.

- Diacritic: [ɾ]
- Examples: ['glɑɾt̩], ['bɛɾɪ], ['dæɾɪ]

•Pg. 139 “Tapping your alveolars”

Phonological Rule 9

Nasals become syllabic at the end of a word and after an obstruent (fricatives, stops, affricates).

- Diacritic: [,]
- Examples: [ˈbek̚ŋ]

•Pg. 139. “Nasals become syllabic”

Phonological Rule 10

Liquids become syllabic at the end of a word and after a consonant.

- Diacritic: [,]
- Examples: [ˈlɔɹ̩t̩], [ˈhɑɹ̩d̩]
- Pg. 140 “Liquids become syllabic”

Phonological Rule 11

**Alveolar become dentalized
before dentals.**

- Diacritic: [̣]
- Examples: [ˈtʰɛ̣ṇθ], [nɔ̣θ]

•Pg. 141

Phonological Rule 12

Laterals become velarized after a vowel and before a consonant or at the end of a word.

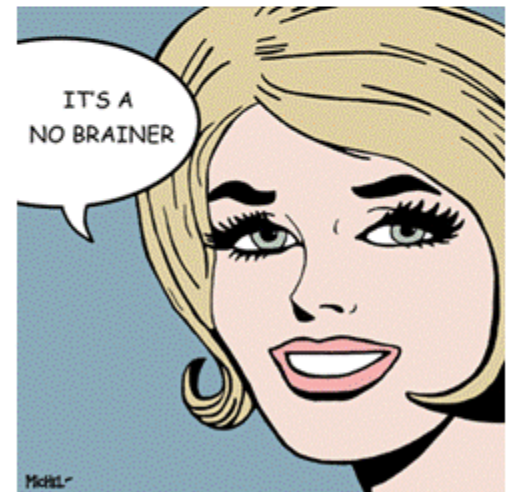
- Diacritic: [~]
- Examples: ['wɔfɫ̠], [sɪɫk]
- Pg. 141 (NOTE – includes final consonant clusters!)

Phonological Rule 13

Vowels become nasalized before nasals.

- Diacritic: [̃]
- Examples: [sĩ m], [sũn]

•Pg. 142



GOOD LUCK!!

