Unit 5

The syllable nucleus in the material world

shaping the airflow to form vocoids.

Slides for the session of
Phonetics with Listening Practice (British)
held on
14 May 2024

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Saarland University

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1. Goals
2. Acoustic phonetics and vowels
3. Where vowels are formed in the mouth
4. Vowels: phonetics vs phonemics
5. Vowel quadrilateral and cardinal vowels
6. English vowel phonemes vs. cardinal vowel positions
7. Using diacritics for vowels
8. English sounds classified
9. Listening Exercise

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2. To become acquainted with the vowel quadrilateral and the cardinal vowels
3. To become acquainted with the diacritics that are used to specify positions 'in between' the cardinal vowels
4. To check which vowel phonemes in English fall close to cardinal vowels, and which do not

Brief overview of acoustic phonetics in relation to vowels

1. Physics of sound waves
2. Overtones and formants
3. Distinguishing vowels by means of formants
4. How to read a spectrogram

Physics of sound waves

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- `http://www.spence.saar.de/akustik.jpg`

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- identifying vowels by their formants (F_1 and F_2)

Distinguishing vowels by means of formants

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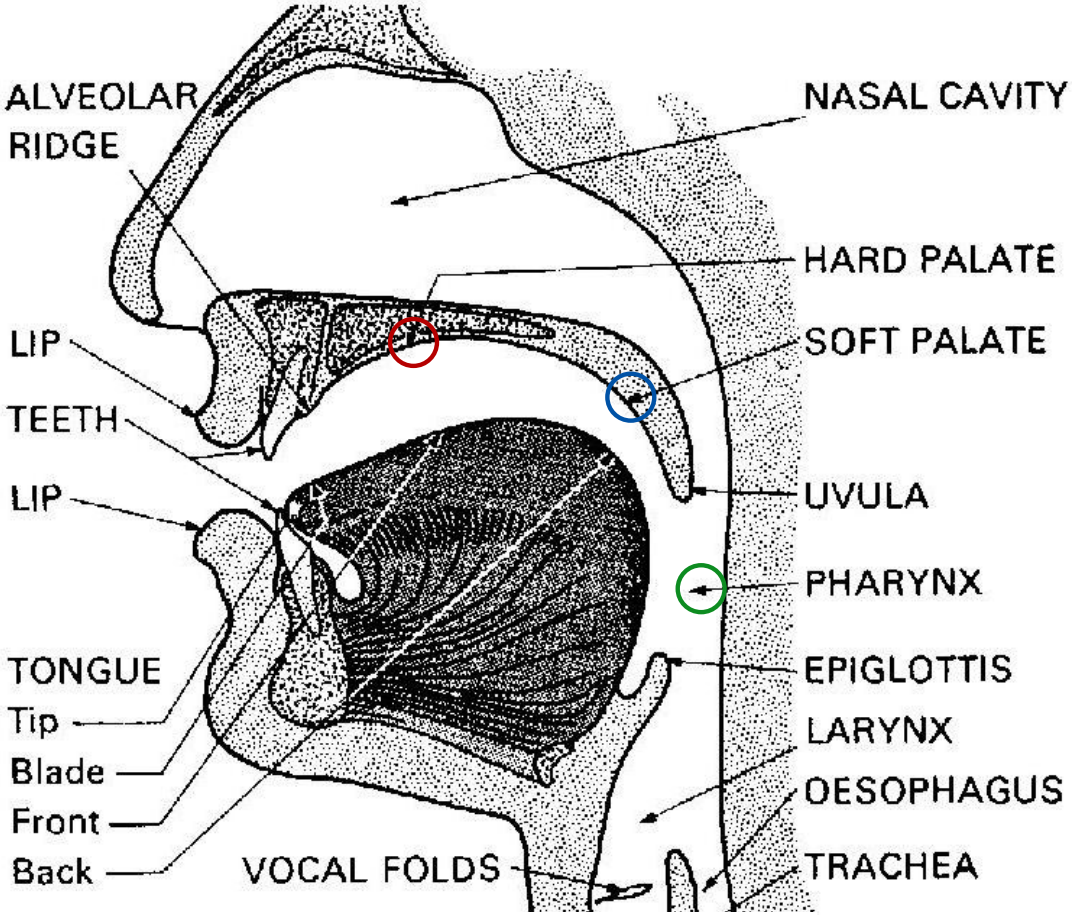
Outer boundaries of the space where vowels can be formed



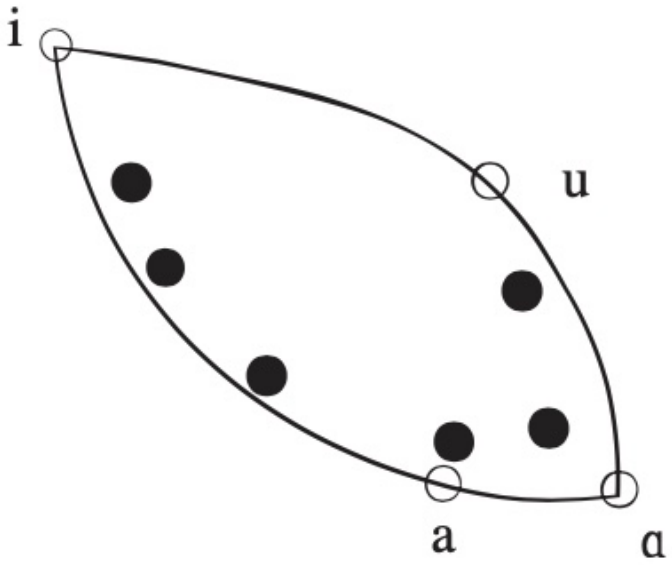
THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

CONSONANTS (PULMONIC) © 2005 IPA

	Bilabial	Labiodental	Dental	Alveolar	Postalveolar	Retroflex	Palatal	Velar	Uvular	Pharyngeal	Glottal
Plosive	p b			t d		ʈ ɖ	c ɟ	k g	q ɢ		ʔ
Nasal	m	ɱ		n		ɳ	ɲ	ŋ	N		
Trill	B			r					R		
Tap or Flap		ⱱ		ɾ		ɽ					
Fricative	ɸ β	f v	θ ð	s z	ʃ ʒ	ʂ ʐ	ç ʝ	x ɣ	χ ʁ	ħ ʕ	h ɦ
Lateral fricative				ɬ ɮ							
Approximant		ʋ		ɹ		ɻ	j	ɰ			
Lateral approximant				l		ɭ	ʎ	ʟ			

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

Position of highest part of tongue in relation to the four basic cardinal vowels



Source: Alex Jones *australian english grammar*, Wild and Woolley, 2001, page 170.

The empty circles show the location of the four basic cardinal vowels [i], [a], [ɑ], [u].

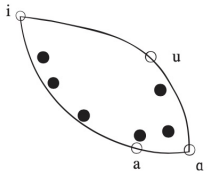
The black circles show the location of the six short vowels of Australian English that are heard in

KIT, DRESS, STRAP, STRUT, LOT, FOOT

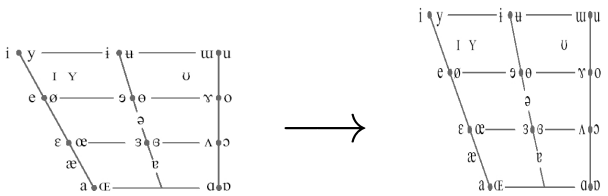
(counter-clockwise from upper left).

From the ‘AFL football’ to the ‘vowel quadrilateral’ … and beyond

The roughly oval ARTICULATORY shape as measured in the mouth:



can be stylised to form the ‘vowel quadrilateral’, based partly on anatomical and partly on psychological (PERCEPTUAL) criteria; this, in turn, can be modified on the basis of ACOUSTIC measurements:



Finally, the quadrilateral shape can be idealised further to form a square or rectangle, if necessary:

/ɪ/		/ʊ/
/e/		
/æ/	/ʌ/	/ɒ/

Vowels: phonetics vs phonemics

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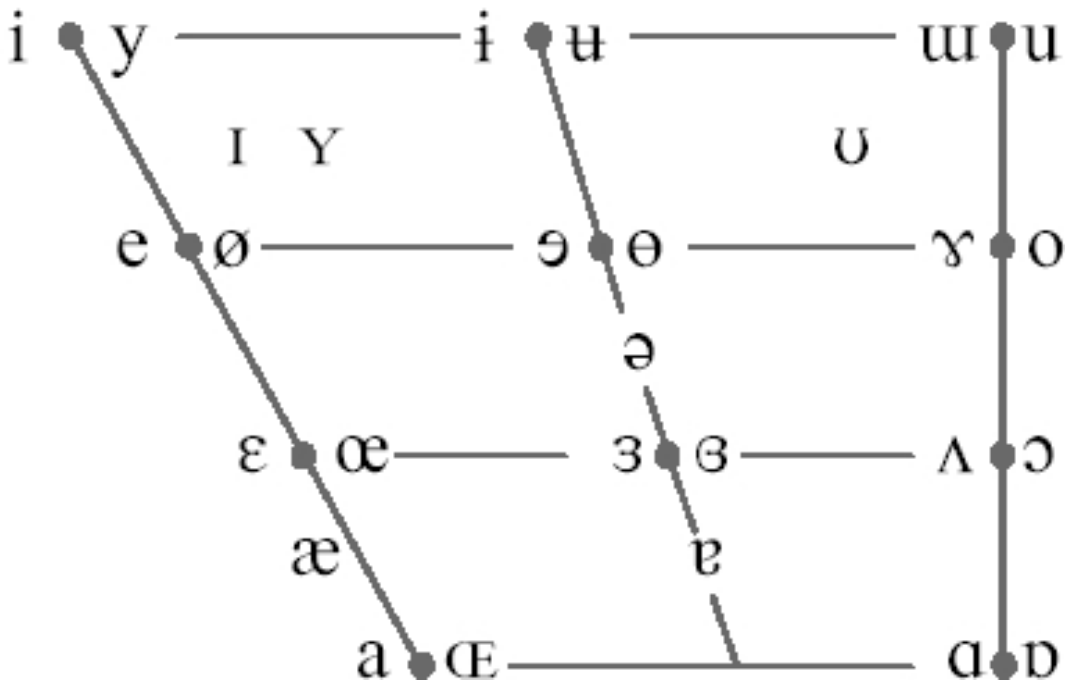
- **English** has / iː ɪ e æ ɑː ɒ ʌ ɔː ʊ uː /

Vowel quadrilateral and cardinal vowels

highest point of tongue is:

front ***back***

JAW IS:



lips are ***unrounded*** (symbol to the ***left*** of the dot) or ***rounded*** (symbol to the ***right*** of the dot); beware [ə] [ɐ] (***unrounded***), [ʊ] (***rounded***): NOTE: [a] is ***'front'*** (just like [i])

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- Look at the **diacritics** on your IPA chart for ways of ***'fine-tuning'*** phonetic transcriptions of vowels.

Using diacritics for vowels

e̝ Raised

e̞ Lowered

u̟ Advanced

i̠ Retracted

ä Centralized

ɪ̈ Mid-Centralized

ɔ̹ More rounded

ɔ̜ Less rounded

ɛ̃ Nasalized

ɜ˞ Rhoticity

English sounds classified

SOUNDS		
OBSTRUENTS	RESONANTS	
	NASAL AND LATERAL RESONANTS	CENTRAL ORAL RESONANTS
[p t tʃ k] [b d dʒ g] [f θ s ʃ] [v ð z ʒ]	[m n ŋ] [l / ɬ]	[w ɹ j] [ə] [ɪ e æ ʌ ɒ ʊ] [i: eɪ aɪ ɔɪ u: əʊ aʊ] [ɪə eə ɜː ɑː ɔː ʊə]
[h]		
CONTOIDS		VOCOIDS
SOUNDS		

Listening Exercise

If you have time, do this listening exercise:
http://www.spence.saar.de/phonetics/exercise_sheet_02-01/exercise_sheet_02-01.pdf