Unit 5

The syllable nucleus in the material world

shaping the airflow to form vocoids.

Slides for the session of
Practical English Phonetics /
Phonetics with Listening Practice (British & General)
held on
10 November 2026

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{ English Department | LangSciTech }
Saarland University

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Goals

Acoustic phonetics and vowels

Where vowels are formed in the mouth

Vowels: phonetics vs phonemics

Vowel quadrilateral and cardinal vowels

English vowel phonemes vs. cardinal vowel positions

Using diacritics for vowels

English sounds classified (A. I. Jones)

Listening Exercise

Dedication



Image source: Obituary for John Rupert Firth

https://doi.org/10.1017/S0041977X00092156

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John Rupert Firth 17.06.1890–-14.12.1960

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
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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

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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

- Motion of particles in direction of propagation of wave …

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

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- formants: *amplified* upper harmonics
- identifying vowels by their formants (F_1 and F_2)

Distinguishing vowels by means of formants

- The distinctive ‘quality’ of a vowel depends on how the vocal tract was shaped when it was being formed, and thus on the acoustic ‘formants’ (especially F_1 and F_2)

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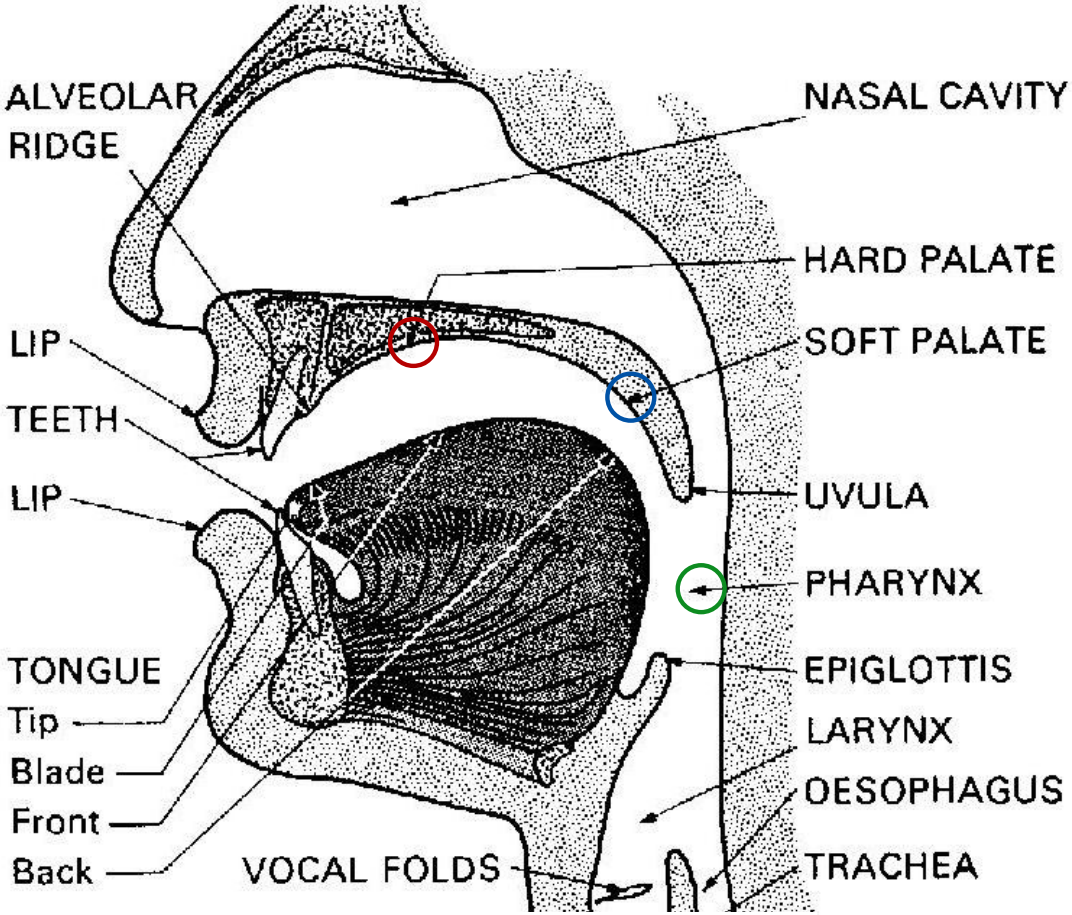
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Outer boundaries of the space where vowels can be formed



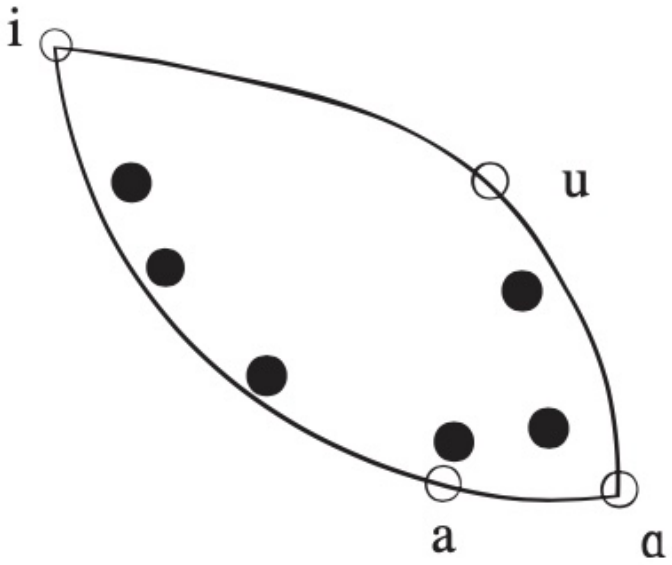
THE INTERNATIONAL PHONETIC ALPHABET (revised to 2005)

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].

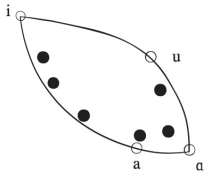
The black circles show the location of the six short vowels of Australian English that are heard in

KIT, DRESS, STRAP, STRUT, LOT, FOOT

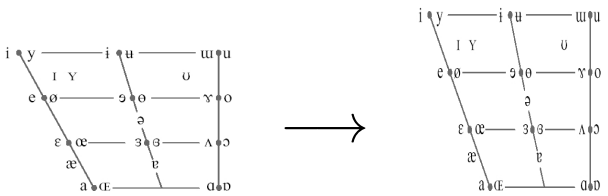
(counter-clockwise from upper left).

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/

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- How many ***phonetically*** distinct vowels are there along the continuum [i] – [a] – [ɑ] – [u] ?
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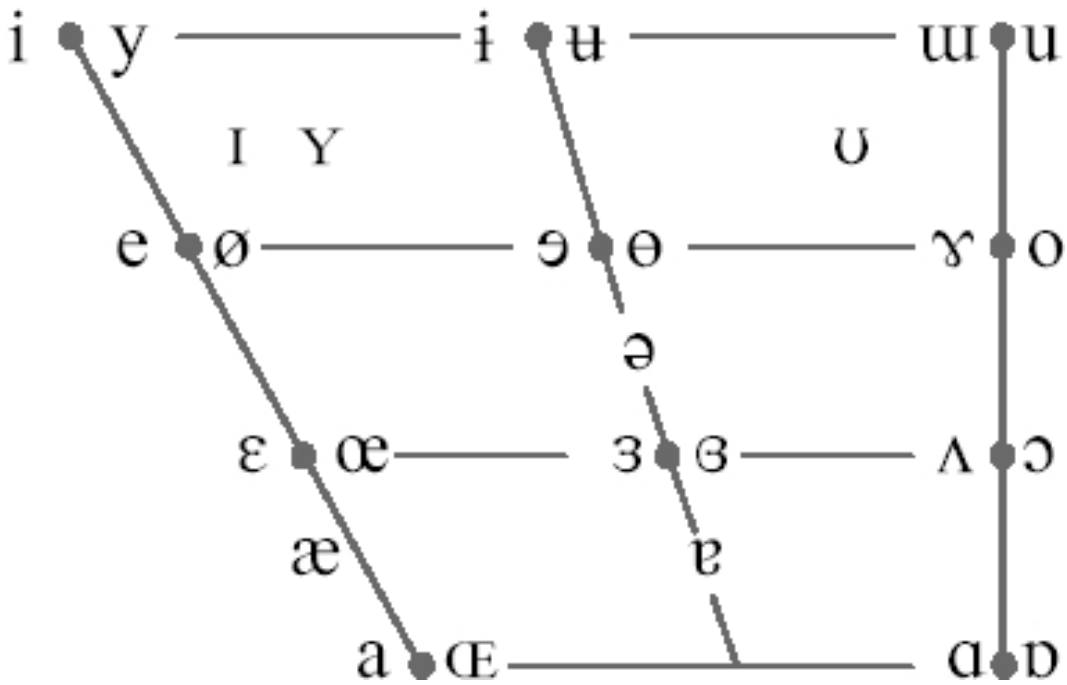
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- **English** has / iː ɪ e æ ɑː ɒ ʌ ɔː ʊ uː /

Vowel quadrilateral and cardinal vowels

highest point of tongue is:

front ***back***

JAW IS:



CLOSE

OPEN

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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English vowel phonemes vs. cardinal vowel positions

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- See if you can identify ***other*** cardinal vowels that are used in pronouncing English phonemes.

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- ***Beware*** the English phoneme /ʌ/. This has evolved away from the [ʌ] position, and is now nearly [ɐ]. (Should it be written as /ɐ/?)

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

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Using diacritics for vowels

e̝ Raised	Lowered e̞
u̟ Advanced	Retracted i̠
ä Centralized	Mid-Centralized ɪ̽
ɔ̹ More rounded	Less rounded ɔ̜
ɛ̃ Nasalized	Rhoticity ɜ˞

English sounds classified (A. I. Jones)

<table>
<tr><td colspan="3">SOUNDS</td></tr>
<tr><td rowspan="2">OBSTRUENTS</td><td colspan="2">RESONANTS</td></tr>
<tr><td>NASAL AND LATERAL RESONANTS</td><td>CENTRAL ORAL RESONANTS</td></tr>
<tr><td>[p t tʃ k]
[b d dʒ g]
[f θ s ʃ]
[v ð z ʒ]</td><td>[m n ŋ]
[l / ɬ]</td><td>[w ɹ j]
[ə]
[ɪ e æ ʌ ɒ ʊ]
[i: eɪ aɪ ɔɪ u: əʊ aʊ]
[ɪə eə ɜː ɑː ɔː ʊə]</td></tr>
<tr><td colspan="3">[h]</td></tr>
<tr><td colspan="2">CONTOIDS</td><td>VOCOIDS</td></tr>
<tr><td colspan="3">SOUNDS</td></tr>
</table>

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`
And if you have even more time, do this one as well.
CONTENT NOTICE: contains innuendo(!):
`http://www.spence.saar.de/phonetics/exercise_sheet_01-01/exercise_sheet_01-01.pdf`

Goals

Acoustic phonetics and vowels

Where vowels are formed in the mouth

Vowels: phonetics vs phonemics

Vowel quadrilateral and cardinal vowels

English vowel phonemes vs. cardinal vowel positions

Using diacritics for vowels

English sounds classified (A. I. Jones)

Listening Exercise