

# Elements

Vowels and vocalic elements

# Vowels and vocalic Elements

- Corner Vowels
- Empty Vowels
- Complex Vowels
- Your Vowels

# Corner Vowels

- Phonology
  - Vowel Inventories
- Phonetics
  - Vowel Space

# Corner Vowels

- Vowel inventories
  - Most basic
    - i, a, u
  - Most common
    - i, e, a, o, u

# Corner Vowels

- Basic assumption of ET:
  - Autonomous Interpretation
    - Every element can stand on its own

# Corner Vowels

- If three basic vowels, then three elements

# Brief excursion

- Empty vowels
  - Schwa
  - Silence

# Corner Vowels

- [i] is represented by |i|
- Articulatory correlates:
  - Tongue high
  - Front



# Corner Vowels

- [i] is represented by |I|
- Acoustic signature
  - F1: low
  - F2: very high
    - Almost coalesces with F3

# Corner Vowels

- [u] is represented by |U|
- Articulatory correlates
  - Backness
  - Roundness

# Corner Vowels

- [u] is represented by |U|
- Acoustic signature:
  - F1: low
  - F2: low

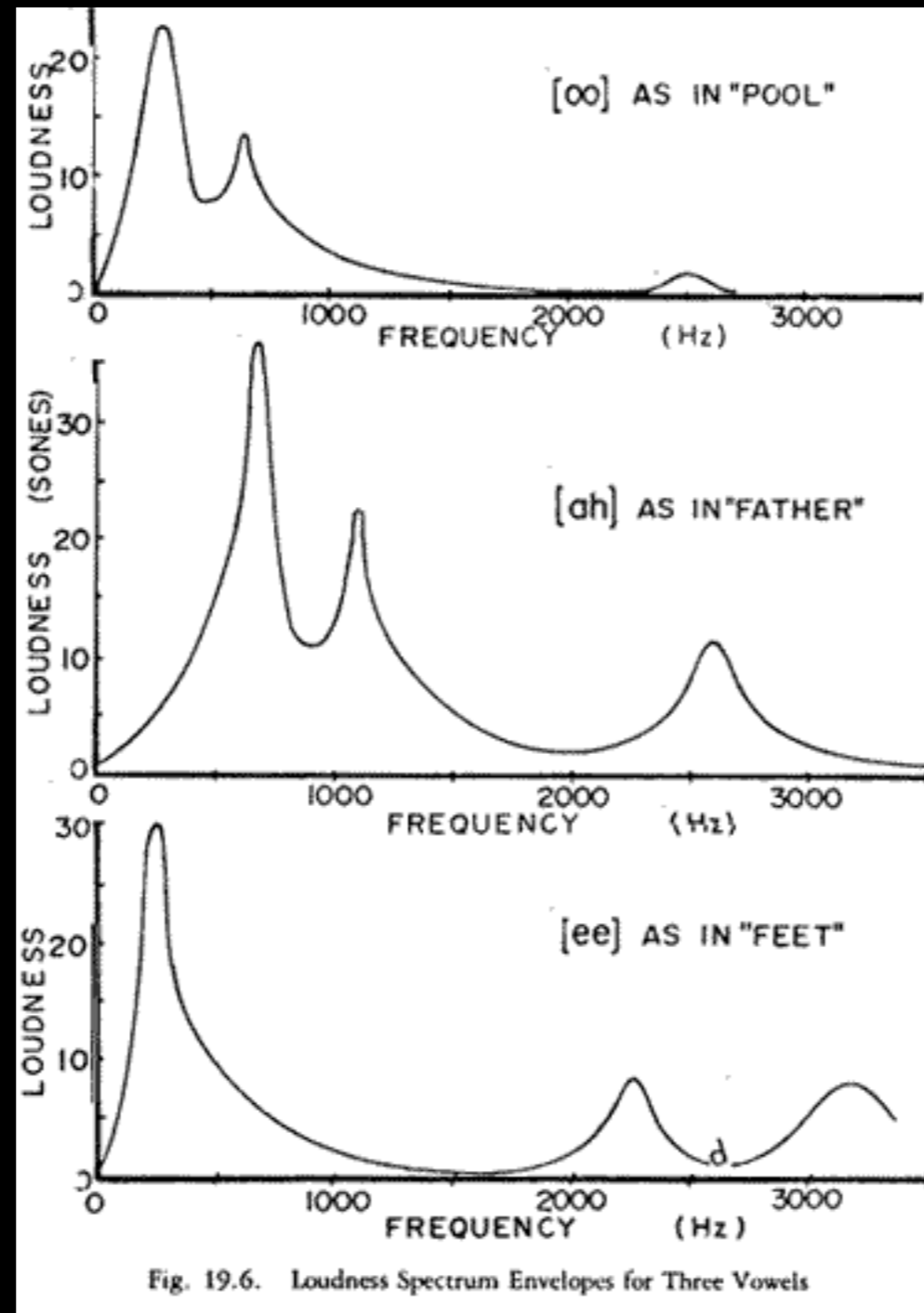
# Corner Vowels

- [a] is represented by |A|
- Articulatory correlates:
  - Low tongue position
  - Lowered jaw

# Corner Vowels

- [a] is represented by |A|
- Acoustic signature:
  - F1: Mid-low
  - F2: Mid-low
    - F1-F2 form a complex

# Corner Vowels



# Complex Vowels

- Basic assumption of ET:
  - Autonomous Interpretation
    - Every element can stand on its own

# Complex Vowels

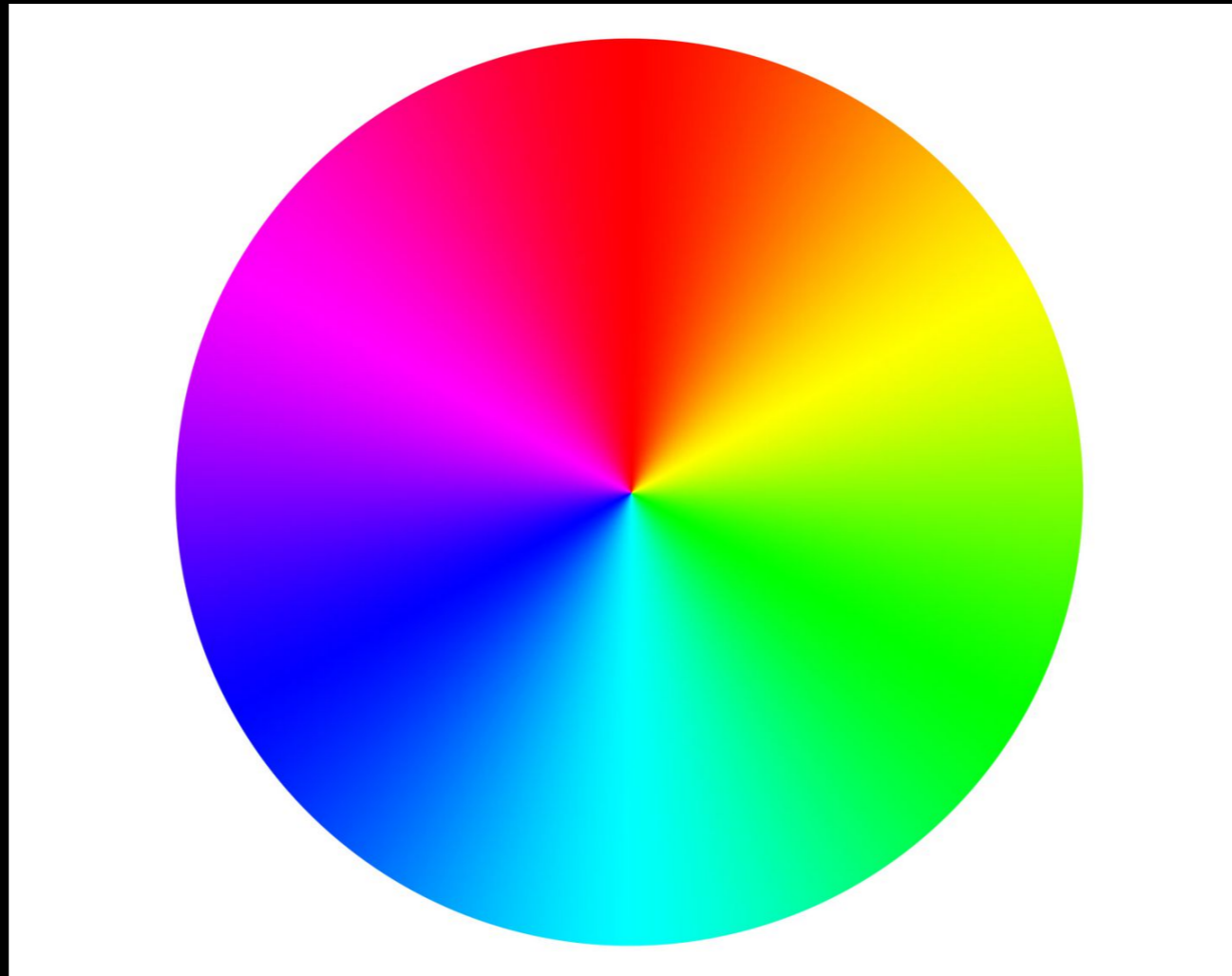
- Non-corner vowels are complex
- Composed of basic ingredients
  - Inheriting properties from both



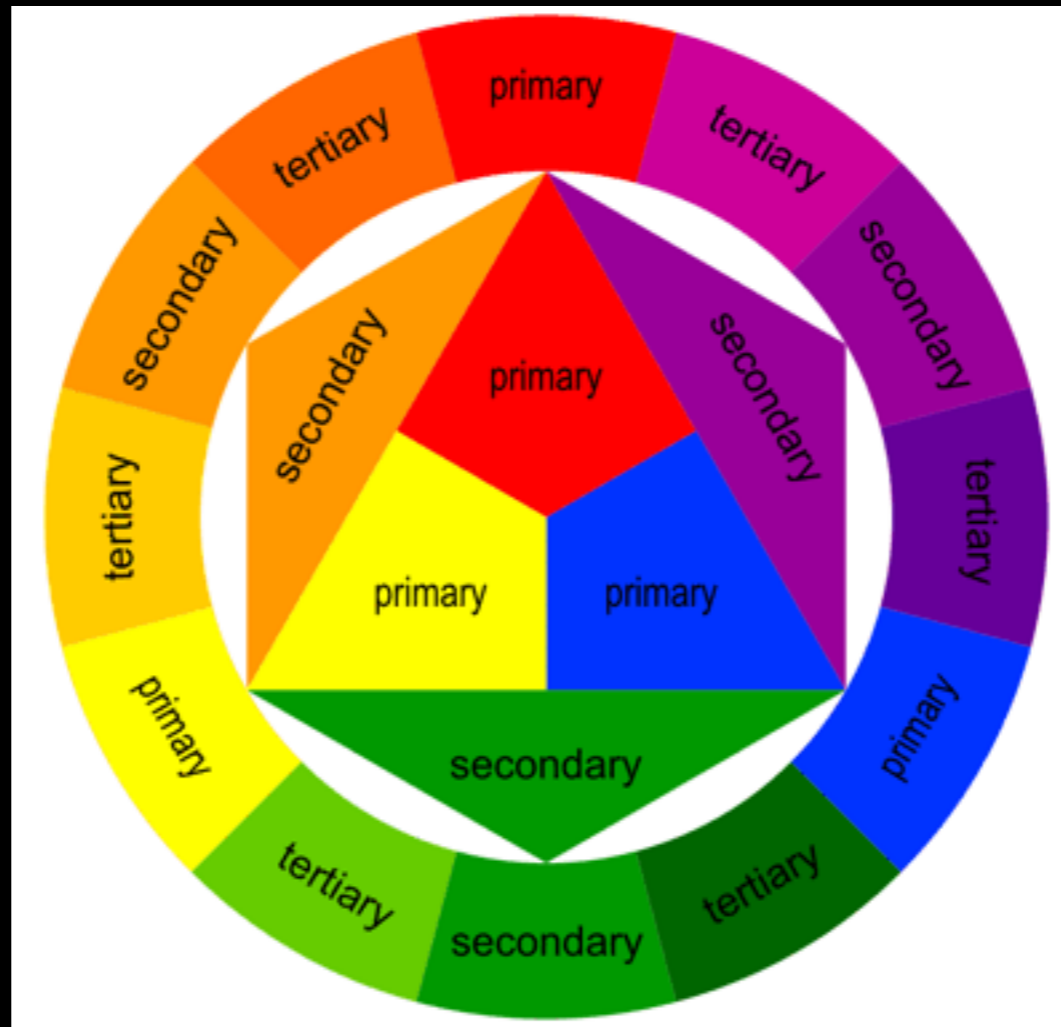
# Complex Vowels

- Analogy: color theory
- Visible spectrum - RYB (RGB, CMYK, LAB etc...)

# Complex Vowels



# Complex Vowels



# Complex Vowels

- Vowel inventories
  - Most basic
    - i, a, u
  - Most common
    - i, e, a, o, u

# Complex Vowels

- [e] is represented by |I,A|
- Articulatory correlates:
  - Medium height
  - Front

# Complex Vowels

- [e] is represented by |I,A|
- Acoustic signature:
  - F1, F2, more central than [i]

# Complex Vowels

- [o] is represented by |A, U|
- Articulatory correlates
  - Medium height
  - Back
  - Round

# Complex Vowels

- [o] is represented by |A, U|
- Acoustic correlates:
  - F1, F2 higher than [u]
  - F1, F2 more separated than [a]



# Complex Vowels

- More contrasts needed!
  - [ɛ, ɔ, ...]

# Complex Vowels

- Not all partners are equal
  - Head-dependent

# Complex Vowels

- Headedness:
  - Properties of head element are more prominent
  - [e] vs. [ɛ]
  - |I, A| vs. |I, A|

# Complex Vowels

- Headedness:
  - Properties of head element are more prominent
  - [o] vs. [ɔ]
  - |U, A| vs. |U, A|

# Complex Vowels

- Combining is not interpolating
- Vowel triangle, or vowel wedge?

# Complex Vowels

- Headedness:
  - Properties of head element are more prominent
  - [e] vs. [ɛ]
  - |I, A| vs. |I, A|

# Complex Vowels

- Headedness:
  - Properties of head element are more prominent
  - [o] vs. [ɔ]
  - |U, A| vs. |U, A|

# Complex Vowels

- Phonetic evidence
  - Blended acoustic properties



# Complex Vowels

- Phonological evidence
  - If [o] consists of |A, U|...
  - ... then we predict that both elements will be visible somehow

# Complex Vowels

- Phonological evidence
  - Diachronic, synchronic
  - Breaking, Coalescence

# Complex Vowels

- Middle English

dai      *Day*

aiçt      *Eight*

vain      *Vain*

pai      *Pay*

lau      *Law*

daufter      *Daughter*

nauht      *Not*

baul      *Ball*

# Complex Vowels

- Modern English: regional varieties
  - Day
  - Boat

# Complex Vowels

- Dutch: regional varieties
  - Mee
  - Boot

# Complex Vowels

- African English

lɛk	<i>Like</i>	rɔnd	<i>Round</i>
fɛndɪŋ	<i>Finding</i>	mɔt ~ mɔp	<i>Mouth</i>
prɛməri	<i>Primary</i>	tɔn	<i>Town</i>
trɛb	<i>Tribe</i>	ɔs	<i>House</i>

# Complex Vowels

- Maga Rukai

<i>Negative</i>	<i>Positive</i>	<i>Gloss</i>	<i>Negative</i>	<i>Positive</i>	<i>Gloss</i>
i-k-valu:	vlo:	Bee	i-k-damli:	dmele	Hemp
i-k-talqu:	tloqo	Bridge	i-k-valsiz:	vlese	Tooth
i-k-palɲu:	plonɔ	Pan	i-k-caki:	cke:	Excrement

# Complex Vowels

- Mongolian

<i>Nominative</i>	<i>Instrumental</i>	<i>Gloss</i>
gal	gal-aɣ	Fire
deɪ	deɪ-eɣ	Coat
doroɣ	doroɣ-goɣ	Stirrup
nøxøɣ	nøxøɣ-øɣ	Comrade



# Complex Vowels

- Recap
  - All vowels consist of combinations of three elements
    - |A|, |I|, |U|
  - Each element can be interpreted on its own
    - |A| ~ [a], |I| ~ [i], |U| ~ [u]

# Complex Vowels

- Recap
  - Non-corner vowels are complex
    - |A, I| ~ [e]
    - |A, U| ~ [o]
    - |I, U| ~ [y]
    - |A, I, U| ~ [ø]

# Complex Vowels

- Recap
  - Elements mix different aspects
    - |A, I| ~ [e]
    - |I, U| ~ [y]

# Complex Vowels

- Recap
  - Elements may differ in prominence
    - |I, A| ~ [e]
    - |I, A| ~ [ɛ]

# Complex Vowels

- Recap
  - Elements describe acoustic targets
    - As can be represented by spectra