Ling 105
Sounds of Language

Tuesday, October 1, 2024

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Perceptual dispersion

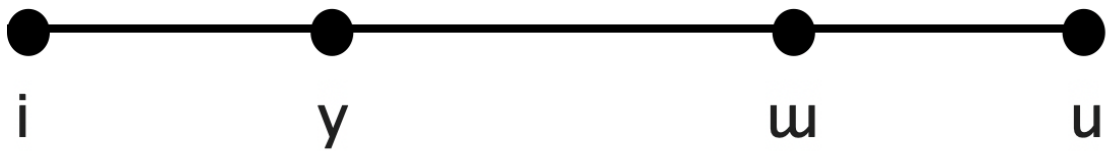
- Languages tend to fill out perceptual-phonetic spaces to render contrasts maximally distinct
- e.g. 3V systems, 5V systems
- Dispersion is maintained diachronically by mergers, enhancements, & chain shifts

Dispersion: rounding

- Setting aside low vowels, back vowels tend to be rounded, and front vowels unrounded
  - In UPSID (Maddieson 1984), 86% of vowels fit this generalization
  - Recall primary vs. secondary cardinal vowels
- Implicational universal: a front rounded vowel occurs only if its unrounded counterpart is also available

Dispersion: rounding

- Articulatorily, no reason to associate rounding with backness
- /y, ɯ, ɑ/ fill the lingual space just as well as /i, u, ɑ/
- Rounding is not physically easier for back vowels
- Acoustically, a continuum in F2: /i, y, ɯ, u/



- Corollary: /i, y/ are more likely to contrast than /e, ø/ (and /ɑ, ɒ/ rarely if ever contrast). Why?
- Complex implicational universal: contrast A implies contrast B

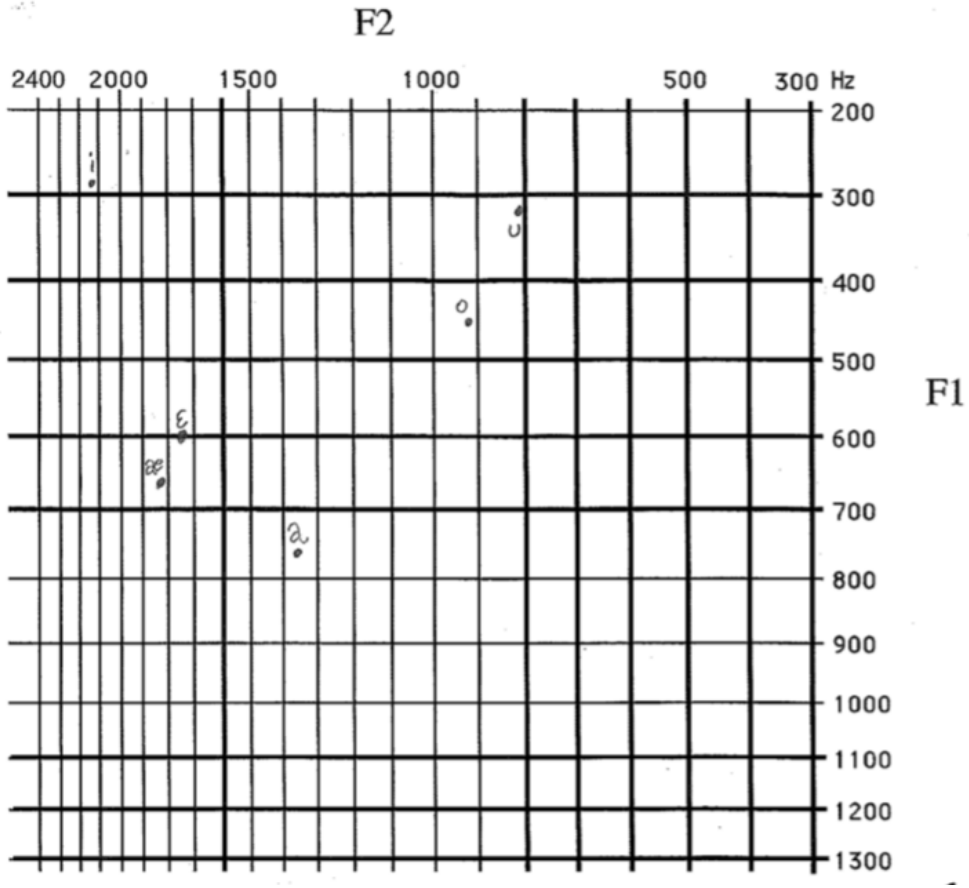
Dispersion: sibilants

- In English, /s/ is unrounded and /ʃ/ is slightly rounded, a case of enhancement. Why not the other way around?
- Center of gravity
- Inspect spectra of sibilants.wav

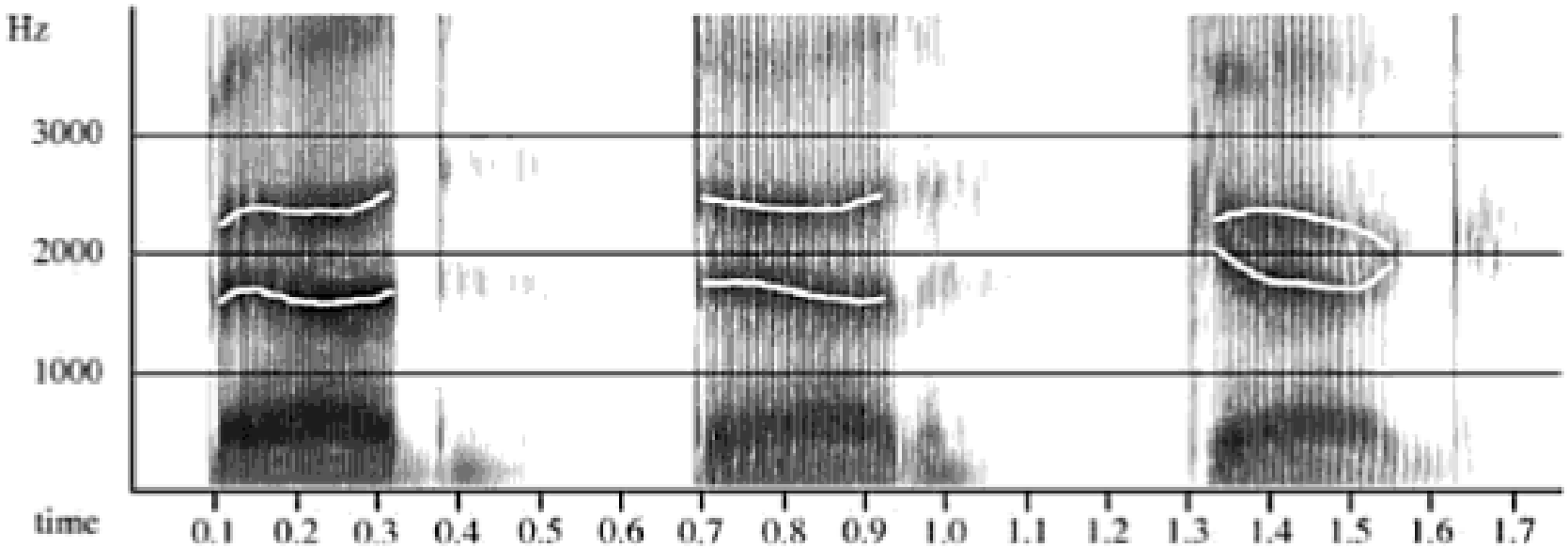
Multi-dimensionality of dispersion

- Vowels that are close in quality often differ in length and other cues

e.g. /ɛ/ vs. /æ/ for me:

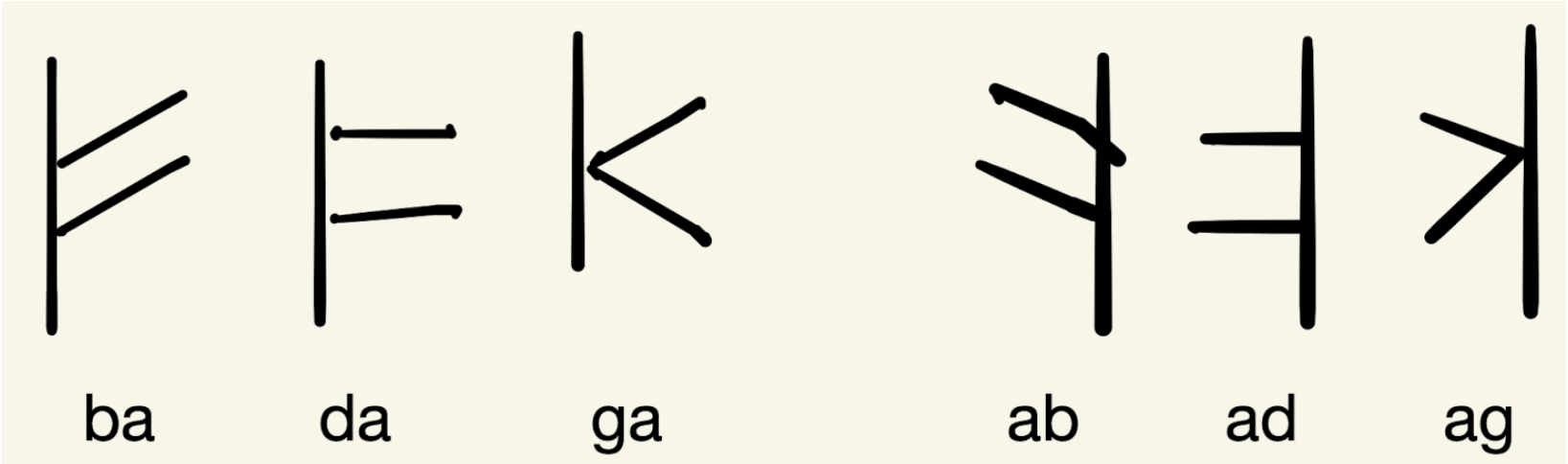


Stops/places



- [b̥ɛd, d̥ɛd, g̊ɛg]
- F2 & F3 transitions from/to V identify consonant place

Stops/places



- Vertical line = V/C boundary
- Horizontal lines = F2 & F3 (stylized)
- Transitions into (left) vs. out of (right) the vowel
- Velar pinch
- Labial lowering

Stops/places

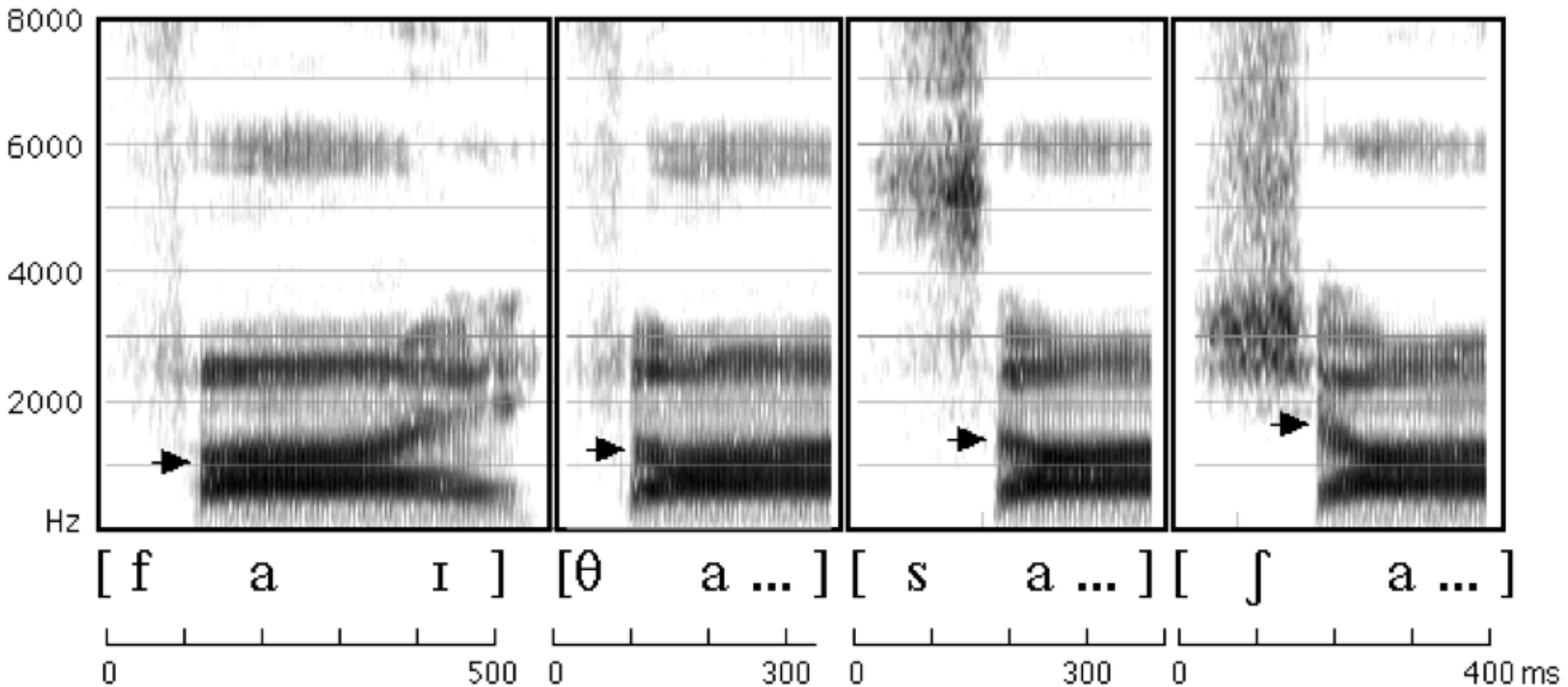
- "sep" illustration (splice in 130 ms silence)
- "spep, step, skep": splice out stops
- Which vowel does the velar pinch sound like?
- Why does F2 increase from labial to coronal to dorsal?

Nasals

- Inspect eme_ene_enge

Fricatives

- Intrinsic cues (unlike plosives)
- F2 generalization
- f/θ merger



Glides

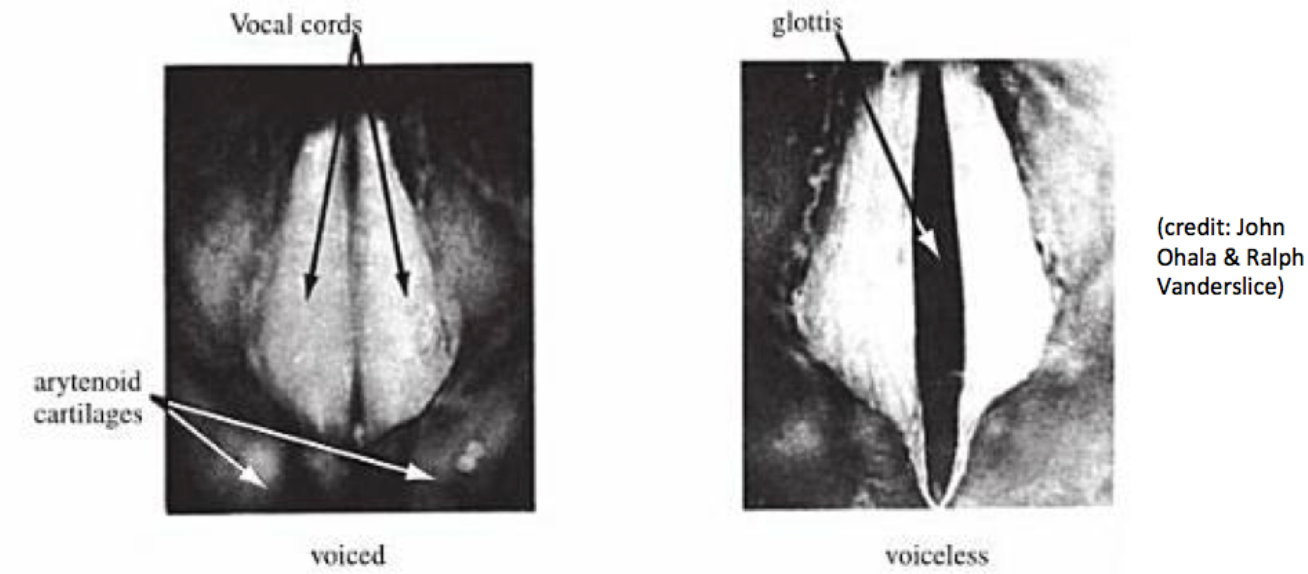
- /w, j/ are the consonantal counterparts of /u, i/
- Inspect “yell, woah”

Rhotic vowels

- Inspect “ah, ar”
  - IPA
  - Formant realization of rhoticity?
  - English rhotic vowel/consonant (syllabicity)
  - Cf. glides (e.g. u $\sim$ w)

Phonation: voiced vs. voiceless

- (Partial) adduction vs. abduction of vocal folds



(credit: John Ohala & Ralph Vanderslice)

- Glottal stop
- Voiced or voiceless: What are the unmarked states of
  - Vowels?
  - Sonorant consonants?
  - Obstruents?

Phonation: breathy vs. creaky

- Creaky voice (a.k.a. laryngealized): [ɑ̰] (Praat creaky_breathy)
- Breathy voice (a.k.a. murmur): [ɑ̤] ([ɦ] can also be considered murmured)
- (vs. modal voicing)

Breathy vs. creaky

- Jalapa Mazatec
  - [tʰá̤] “seed” ♪
  - [ndã̰́] “buttocks” ♪
- Santiago Matatlán Zapotec
  - [gã̰́] “chicken” ♪
  - [diza̤̰ː] “language” ♪

Breathy vowel vs. breathy release

- Gujarati (note also final taps)
  - [bạɾ] “outside” ♪
  - [b̤ʱaɾ] “burden” ♪
  - [baɾ] “twelve” ♪

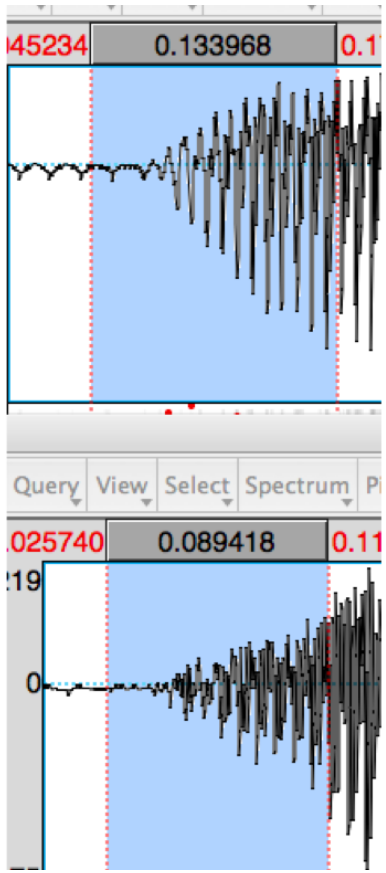
  - [kan] “ear” ♪
  - [kạn] “Krishna” ♪

Breathy release

- Hindi
  - [bal] “hair” ♪
  - [pal] “take care of” ♪
  - [pʰal] “knife blade” ♪
  - [b̤ʱal] “forehead” ♪

Creaky voice

- Hausa
  - [jaː] “he” ♪
  - [j̰aː] “daughter” ♪



The many dimensions of vowels

- Height
- Backness
- Rounding
- Rhoticity
- Nasality
- Length (= phonemicized duration)
- Tone (= phonemicized f0 contour)
- Diphthongization (= phonemicized F1/F2 contour)
- Tenseness
- Phonation