

**Ling 110**  
**Introduction to Phonetics and Phonology**  
**Final Exam**

**1. True/False questions.** Mark each statement as “true” or “false”.

- 1. In the Cardinal Vowels system, cardinal vowel #1 has an articulatory definition.
- 2. The front primary cardinal vowels (#1-5) are all produced with lip rounding.
- 3. In the IPA, there are more place of articulation contrasts for stops than for fricatives..
- 4. To indicate vowel nasality it doesn't matter whether you place the tilde over the vowel letter or under it.
- 5. The IPA symbol for a voiceless labial-velar approximant is [ʍ].
- 6. The IPA symbol for a voiced labial-velar fricative is [ʙ].
- 7. Ejective stops are more commonly voiceless than voiced.
- 8. Breathy phonation has less airflow than modal phonation.
- 9. Plain voiced stops are more common in the languages of the world than plain voiceless stops.

**2. Vowels.**

2.1 Which is the more common vowel inventory (A or B) in the languages of the world? Give an explanation (based on either speech production or speech perception) for why A or B is more likely to occur.

A)    i        u  
      e        o            ã     õ  
          a                    ã

B)    i        u            ã        ã  
      e        o  
          a                    ã

2.2 Cross-linguistically back vowels are usually round. What perceptual motivation is there for this? Relate your explanation to the frequency of the second vowel formant (F2).

2.3. All languages contrast vowels on the height dimension, but there are languages that do not

contrast vowels on the front/back dimension (having only central vowels usually). This is related to the number and arrangement of vowel symbols in the IPA vowel chart. The number of contrastive vowel heights provided in the IPA vowel chart is four (close, close-mid, open-mid, and open). What is the number of contrasts provided in the front-back dimension in the IPA vowel chart? Briefly discuss why (speakers of) languages might use more height contrasts (on the acoustic F1 dimension) than front/back contrasts (on the acoustic F2 dimension) in vowels.

### 3. Consonants - place and manner

3.1 Articulation at some places of articulation may be further described as apical or laminal. Which of the following may NOT be apical or laminal?

dental, alveolar, palatal, retroflex, bilabial

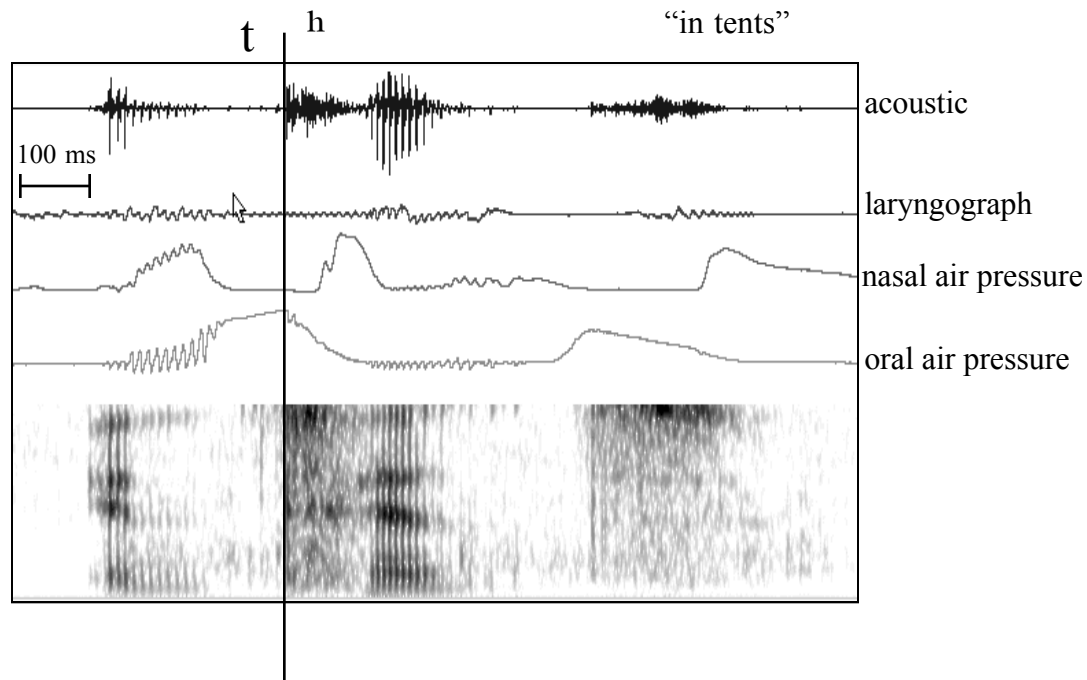
3.2 There are no IPA symbols for pharyngeal or glottal nasal segments. Is this an accidental gap (in that linguists just haven't happened to find any pharyngeal or glottal nasals), or are such consonants simply impossible to make?

3.3 Voiced fricatives often lose their frication noise becoming approximants. For example the voice palatal fricative [j̥] becomes the palatal glide [j]. How would you indicate in phonetic transcription the approximant versions of these voiced fricatives?

[β], [v], [ð], [ɹ].

3.4 In general terms (i.e. no formulas or calculations please) what aerodynamic factors are involved in causing voiced fricatives to become voiced approximants? Be specific! Discuss (in specific physiological terms) pressures, chambers, channels, and airflow; you need to bring up the issues relevant to the presence or absence of frication and of voicing.

3.5 The figure below shows acoustic recording, nasal air pressure, oral air pressure and a relatively useless laryngograph signal of Keith Johnson saying the phrase "in tents". Nasal air pressure was measured with a "nasal olive" a stopper in one nostril that had a pressure tube inserted in a hole drilled through the stopper (think hamster water bottle). The vertical line shows the moment of stop release burst of the first /t/ of "tents". Did this speaker keep his nose open during the /t/ of "tents"? Mark below the spectrogram the moments when the nasopharyngeal port is open and shut.



#### 4. Airstream mechanisms

4.1 Ladefoged describes implosives using a sagittal section (as below) labeled according to the sequence of events during the production of the sound. Complete the sagittal section and then list the sequence of articulatory events for the production of [ɟ].



4.2 What are some acoustic characteristics of creaky voice? (consider periodicity, pitch, relative amplitudes of H1 and H2, spectral tilt, and any other acoustic properties you think might distinguish creaky voice from modal phonation.)

## **5. Phonological processes and features.**

5.1. The vowels [i] and [ɪ] tend to neutralize before [ɹ] in some dialects of American English. Cite some other examples of neutralization. How does the phenomenon of neutralization relate to the idea that distinctive sounds (that is ‘phonemes’) make up an inventory that is available for use in a language?

5.2 The simultaneous stop  $[\widehat{kp}]$  is more common in language than is  $[\widehat{kt}]$ . Considering the movements of the articulators that are required to produce these two kinds of simultaneous stops which one is most likely to result in a velaric click? and what one sentence explanation can you give for the greater likelihood of  $[\widehat{kp}]$ ?

5.3 In the following examples of assimilation what phonetic property or phonological feature is being assimilated?

b -> d/ \_ n

s -> z/ n \_

a -> ã / \_ n

## 6. Stress and intonation.

6.1. Fill in the prominence hierarchies (label the levels of the hierarchy) for the word 'police' as said these two ways (assume that the intonation contour is H\* L- L%):

nuclear accent

accent

full vowel

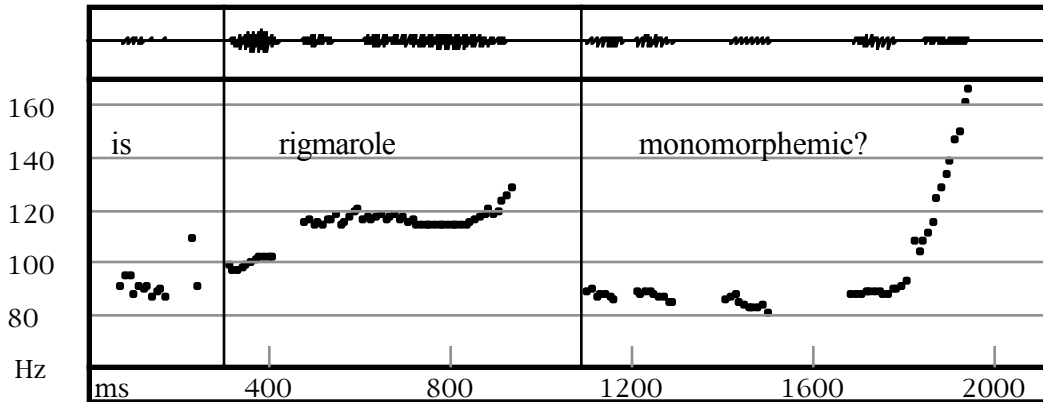
vowel

$[p^h \text{ ə } l i s]$

$[p^h \text{ o}^U l i s]$

6.2 Below is a pitch trace of the utterance *Is rigmarole monomorphémic?* with vertical lines at the word boundaries.

Untitled 1-Pitch.PICT



a. Is this utterance composed of one intonational phrase or two? What durational and pitch information did you use to answer this question?

b. How would you phonetically transcribe the pitch pattern on *monomorphemic?* What phonological transcription (in terms of accents and boundary tones) would you use to describe the tune?

6.3. The two utterances shown in the following spectrograms are *night rate* and *nitrate*. They illustrate how syllable structure may be cued by the detailed phonetic realization of segments. In this case syllable-final /t/ is different from syllable-initial /t/. Label the spectrogram to indicate which two syllable span is “night rate” and which is “nitrate”.

Is the first /t/ in *nitrate* affiliated with the first syllable or the second (compare how you say “train”)? What acoustic cue or cues in the spectrogram support your conclusion?

Untitled 1-Spectrogram.PICT

