

80%

Final Exam

Name: Jamie Yu

Structure of the Exam

This exam was designed to take about an hour and a half. However, you have the whole class period in which to finish it.

The exam has three parts:

Part I-a:	Dictation in Estonian	35 pts
Part I-b:	Dictation in Navajo	25 pts
Part II:	Short answer questions	40 pts

Tear off the last page of the exam. On one side, there is a phoneme chart for Estonian, and some notes about Estonian allophones. On the other side, it has the same thing for Navajo. Refer to this sheet while you are doing the two dictation portions of the test.

Part I-a: Dictation in Estonian

Example Words for Reference

'sheep'	/lam:as/	'manufacturer'	/t:φ:tʰ:a/
'myrrh'	/myr/	'fields'	/væfʰad/
'bride'	/mørsʰa/	'chocolate'	/ʃok:ola:d/
'enzyme'	/ensy:m/	'edition'	/tryk:/
'ice age'	/jæ:aeg/	'beige'	/be:ʒ/
'audacious'	/hulʰjulge/	'apron'	/p:ø:l:/
'suitcase'	/k:ohver/	'missile'	/rak:et:/
'holder'	/hoidʰa/	'page'	/p:a:ž/ ʒ
'midnight'	/sydæø:/		

Test words

Write *phonemic* transcriptions for the dictation items. That means your answers should be in // brackets, and you should only use symbols from the Estonian phoneme chart.¹

1. myrrh
2. hoid
3. chocolate
4. ice age ✓
5. sheep
6. apron
7. missile
8. holder ✓
9. bride
10. midnight

¹ However, it may help you to jot down a *phonetic* transcription of what you hear on scratch paper, so you can refer to that and to the phoneme chart to figure out what phonemes are being said.

Part I-b: Dictation in Navajo

Example Words for Reference

'water'	/tʰó/	'ant'	/wóʒátʰí:ʔ/
'ice'	/tʰín/	'crescent moon'	/táh jí:t'á/
'rotten'	/tá:t/	'reside'	/k'é:hátʰí/
'goat'	/tʰízi/	'cow'	/pé:káʃi/
'white'	/líkà/	'acute accent'	/ʒíts'ó:z/
'boy'	/áʃkʰi:/	'cross'	/áhnáʔátsòh/

Test words

Write *phonemic* transcriptions for the dictation items. That means your answers should be in // brackets, and you should only use symbols from the Navajo phoneme chart.

1. /tíné/ ✓

2. /kíõ:/

3. /tétʰó:z/

4. /k'ó:t/

5. /máʔ:ts'òh/

6. /áʔí:ts'í/

Part II

Problem 1 - (5 points)

ɕu mə k^wa zɛ* ʔø

- Underline the words that use the lips at some point
- Put a * by the words that use the tongue tip at some point
- Circle the words in which the vocal folds are spread at some point

Problem 2 - Place of Articulation (3 points)

Briefly explain the difference between [ɟ] and [dʒ] in terms of what the tongue does.

when pronouncing [ɟ], the tongue body is touching the palate & the tongue tip is resting. However, when pronouncing [dʒ], the tongue tip is at the alveolar ridge & the tongue body moves towards the palate.

Problem 3 - Coarticulation (4 points)

In the movie we watched in week 1, we saw an X-ray video of woman saying the sequences [apapapa] and [ipipipi]. When they froze the video on the closure for [p], the X-ray showed that the position of her **tongue body** was different during a [p] from [apapapa] and a [p] from [ipipipi].

- What about the position of her tongue was different? (Even if you don't remember the video, you can figure out what it probably was based on your understanding of the articulatory system).

for [ipipipi], the tongue is higher than [apapapa]

- Explain the physical, articulatory reason for this difference. Why did the X-ray show a different tongue position? Why do both consonants nevertheless just sound like [p]?

There is a difference in the position because the p is in different environments. Since [i] is a high vowel, the [p] will "get ready" and will be in a high position. They both sound like [p] because [p] only relies on the position of the lips and tongue height does not affect it.

Problem 4 - Phonetics for Robots (9 points)

You have just built a speaking robot, with intricate, human-like articulators. Nice! Your robot has a tongue, and vocal folds, and so on, but it doesn't yet know what to do with them.

At the moment, everything is in resting position, defined as follows: lips are open, tongue-body is mid central, tongue tip is resting behind lower teeth, velum is lowered, vocal folds are spread, death laser is turned off.

- a. Program your robot to say the word "alt," pronounced [ɔlt], by giving it explicit step-by-step instructions on how to move its articulators. Each step should be very simple, and involve only one articulator. Some steps have been done for you.

Step 1 (ɔ) > Move the tongue body back and slightly down to a lower-mid height.

Step 2 (ɔ) > Round the lips.

Step 3 (ɔ) > Raise the velum.

Step 4 (ɔ) > Put the vocal folds near each other (but not touching).

Step 5 (ɔ) > Exhale to initiate voicing.

Step 6 (l) > *move tongue body forward so tongue tip @ alveolar ridge*

Step 7 (l) > *unround the lips*

Step 8 (t) > *open*
~~close~~ *vocal folds*

Step 9 (t) > *build up pressure behind tongue @ alveolar ridge*
+ sides up

Step 10 (t) > Quickly lower the tongue tip away from the alveolar ridge.

-1.5

- b. Now program it to say the IPA sequence [q'ə], again starting from the resting position.

Step 1 (q') > Put the back of the tongue body against the uvula.

Step 2 (q') > Raise the velum. *close glottis*

Step 3 (q') > *also larynx to create pressure*

Step 4 (q') > ~~lower velum~~

-2

Step 5 (q') > *move tongue body forward, away from uvula*

Step 6 (ə) > Open the vocal folds a bit.

Step 7 (ə) > Exhale to initiate voicing.

- c. After processing these instructions, your robot accidentally says [q'ə] instead of [q'ə].

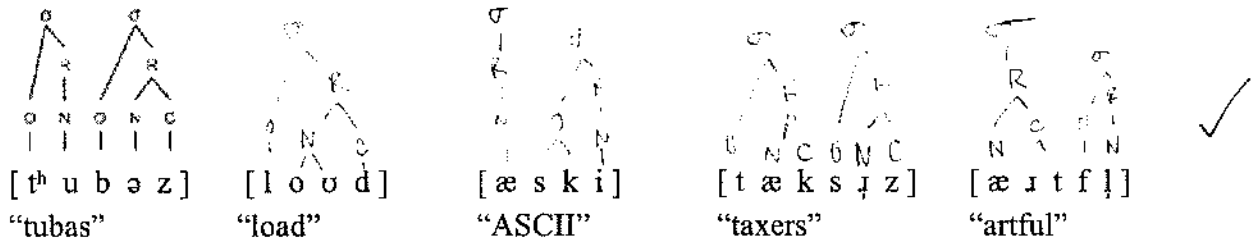
Oops! What specifically it do wrong?

~~exhale first then open the vocal folds~~ -2

2.5 -5.5

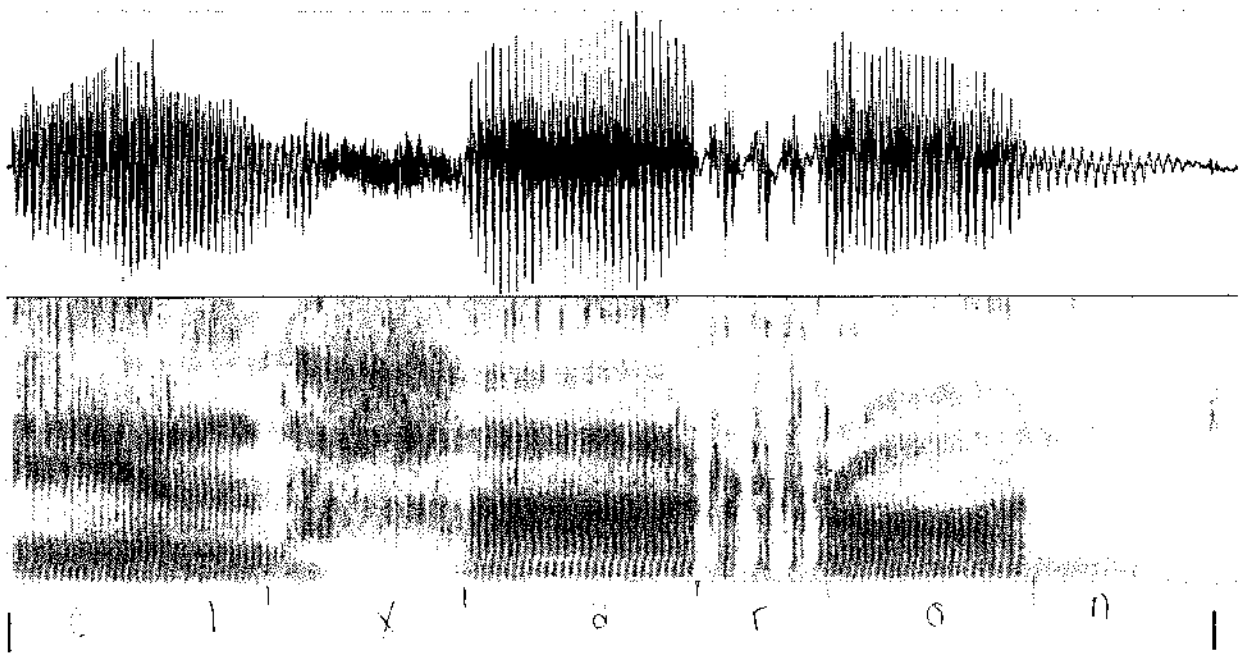
Problem 5 - Syllable Structure (4 points)

Draw the syllable structure for the following English words, using the Maximal Onset Rule.



Problem 6 - Segmentation (9 points)

Here is a waveform and a wide-band spectrogram (showing frequencies from 0 to 5000 Hz), of the Spanish noun phrase *el jarrón* [elxa'ron].

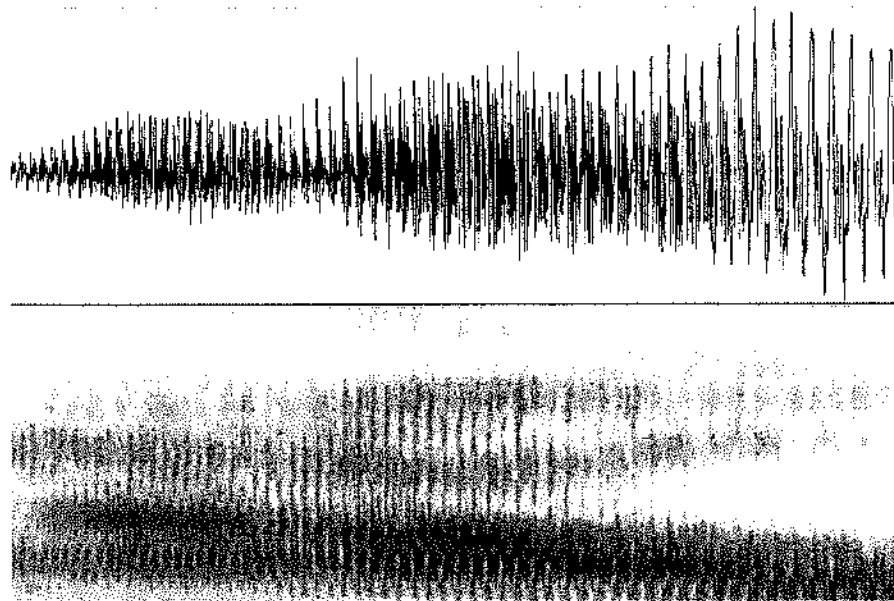


- Segment by drawing lines under it separating the sounds, and label the sounds in IPA.
- How many times did the tongue tip come into contact with the the alveolar ridge during this recording? 5
- There is a faint vertical line on the spectrogram directly over the | symbol at the very end of the recording. What articulatory gesture made this sound?

the tongue was on the alveolar ridge when making the n sound so the vertical line is when the tongue was released

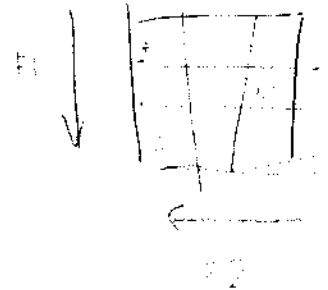
Problem 7 - Spectrogram Reading (6 points)

The following is a waveform and a wide-band spectrogram of a vowel. The y-axis for the spectrogram is the usual 0 to 5000 Hz. F1, F2, F3, F4, and faint traces of F5 are all visible.



- a. Is the vowel [a], [i], [u], [ai], or [au]? Briefly justify your answer.

[au] because F1 is getting lower and so is F2, which means the diphthong is getting higher & darker ✓



- b. Is the pitch rising, falling, or level? Briefly justify your answer.

falling because the waves are getting farther apart so lower frequency ✓

- c. Is the vowel getting louder, quieter, or neither? Briefly justify your answer.

louder because the amplitude in the wave diagram is increasing ✓