Introduction to Phonology and Phonetics Final Portfolio Assessment

Semester 1, 2024

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Portfolio overview

The assessment for this course is made up of a portfolio of five exercises that you will complete throughout the term. This may seem like a lot! But remember, you will have a lot of the required knowledge to work on the portfolio when it is released to you. Working on it from the release date until the due date should give you plenty of time, and hopefully reduce your stress during the busy finals period.

Structure

The assessment for this course is made up of a portfolio of five exercises that you will complete throughout the term. This portfolio is due on 9 December at 12 noon via Turnitin on Learn.

The entire portfolio should be no more than 10 pages in total, including any figures, references, or cover pages, with a total word limit of 3000 words. Each individual exercise should not exceed pages. Anything beyond 2 pages will be disregarded for marking purposes.

Materials

The materials for each of the five parts of the portfolio will be specified in the instructions and will be made available on Learn, or linked in this document. Importantly, You **do not** need to consult outside references.

The materials can be downloaded from here.

Tasks

Each exercise will consist of "Core" tasks that you must complete, along with "Advanced" tasks you may complete if you would like to go further. These are not required and should not be the focus of your work on each exercise.

Please note: it is possible to achieve top marks (70+) without incorporating any of the Stretch tasks. Therefore, it is in your best interest to focus on the Core tasks and make sure that you do them well. Note also that the 2-page limit per exercise, and 10-page limit overall, applies regardless of whether you include Stretch tasks in your submission.

Submitting the assessment

All five parts will be submitted in a single PDF as part of a portfolio **on 9 December at 12 noon via Turnitin on Learn.**

- The text for each exercise must not exceed 2 pages.

- The entire portfolio submission should not exceed 10 pages.

- The overall word limit for the portfolio is 3000 words.

Materials

The materials for each of the five parts of the portfolio will be specified in the instructions and will be made available on Learn, or linked in this document. Importantly, You **do not** need to consult outside references. You should instead limit yourself to the materials that have been explicitly provided on Learn.

You can download the zipped folder with materials here [zv].

Core and Advanced tasks

Each exercise will consist of "Core" tasks that you must complete, along with "Advanced" tasks you may complete if you would like to go further. These are not required and should not be the focus of your work on each exercise.

Please note: it is possible to achieve top marks (70+) without incorporating any of the Stretch tasks. Therefore, it is in your best interest to focus on the Core tasks and make sure that you do them well. Note also that the 2-page limit per exercise, and 10-page limit overall, applies regardless of whether you include Stretch tasks in your submission.

1 Chamarro VOT

1.1 Overview

In this part of your portfolio you will annotate, measure, and report on voice onset time (VOT) in Chamorro, an Austronesian language spoken in the Mariana Islands. This language makes use of a two-way voicing contrast (voiced and voiceless) in stops, which occur at three places of articulation. Your task is to identify pairs of words that exemplify this contrast at all three places of articulation, annotate them to identify where voicing begins relative to stop closure release, that is, voice onset time, and report the values that you measure.

Remember: The text that you submit for this exercise must not exceed 2 pages. **Anything beyond 2 pages will be ignored** for marking purposes. This includes all text, figures, graphs, tables, references, and stretch materials, if any.

- Your entire portfolio submission should not exceed 10 pages.

If you need a refresher on how to identify and measure VOT, you can consult the workshop on this topic from Week 5.

1.2 Materials

The materials for this exercise are available on Learn and consist of 6 audio files and 1 word list file. The data for this exercise is taken from the UCLA Phonetics Lab Archive.

1.3 Tasks and reporting

Your general task is to measure and report voice onset time. The sections below spell out how you should do this. The "Core" section explains what you MUST do, while the "Advanced" section provides guidance if you would like to go further.

1.3.1 Core tasks

- Choose word list items that exemplify the voicing contrast at each of the three places of articulation where it occurs (bilabial, alveolar, and velar). You should have 6 items in total (three places, two voicing categories).

  - Report which word list items you are focusing on for your investigation. Include the word list item number, IPA transcription, orthographic transcription, and gloss/translation for the items that you choose.

- Annotate the onset of voicing and stop closure release bursts for the tokens you have identified.

  - Describe your annotation methods in text. Supply enough detail that someone could replicate your annotation.

- Include at least two illustrative spectrograms with accompanying TextGrid showing your annotations for one voiced sound and one voiceless sound. These can be screenshots from Praat.

- Report the Voice Onset Time for all 6 tokens that you have measured. (This can also be in a table.)

- Identify and briefly summarize/discuss any potential patterns you observe in the VOT data, making reference to phonetically relevant information such as voicing and place of articulation categories.

1.3.2 Advanced tasks

Consider other factors, including contextual factors, that may influence the VOT measures that you have collected. Provide information about the tokens that you investigated, and the ways in which the factors you identify influence your interpretation of the patterns that you have observed, and how they modify your interpretation of those patterns.

2 Chamarro vowel space and acoustics

2.1 Overview

In this exercise you will annotate, measure, and report on vowel formants in Chamorro, an Austronesian language spoken in the Mariana Islands. This language makes use of three levels of vowel height (high, mid, and low) and two levels of advancement (front and back), resulting in at least six contrastive vowel qualities: i, , a, , o, u.

Remember: The text that you submit for this exercise must not exceed 2 pages. **Anything beyond 2 pages will be ignored** for marking purposes. This includes all text, figures, graphs, tables, references, and stretch materials, if any.

- Your entire portfolio submission should not exceed 10 pages.

If you need a refresher on how to identify and measure Formants and F0, you can consult the workshop on this topic from Week 4.

2.2 Materials

The materials for this exercise are available on Learn and consist of 6 audio files and 1 word list file. They are the same materials as in part 1. The data for this exercise is taken from the UCLA Phonetics Lab Archive.

2.3 Tasks

Your general task is to measure and report voice onset time. The sections below spell out how you should do this. The "Core" section explains what you MUST do, while the "Advanced" section provides guidance if you would like to go further.

2.3.1 Core Task 1

- Identify word list items that exemplify each of the vowel qualities. You should have 6 items in total, one for each vowel.

- Report which word list items you are focusing on for your investigation. Include the word list item number, IPA transcription, orthographic transcription, and gloss/translation for the items that you choose. You can report them in a table for ease of presentation.

- Using a TextGrid, annotate the 6 items you have identified. Describe your annotation methods in text. Where did you take your formant measurements from? How did you determine this point? How did you extract the formant measurements?

- Include at least one illustrative spectrogram with its accompanying TextGrid showing your annotations.

- Report the frequency values of the first and second formants for all 6 tokens that you have measured. (This can be reported in a table.)

- Discuss the patterns you see in the data.

2.3.2 Core Task 2

Create a helpful visualization of your vowel space with F2 on the x axis and F1 on the y axis, and arrayed in the traditional fashion. Place this figure in your submission. This can be done in Excel, other computer programs, or simply by hand on graph paper, and scanned or photographed on your phone. See the Week 4 lab for details and templates.

2.3.3 Core Task 3

Choose **2 of the 6** vowels and perform the following tasks for both vowels.

- Locate the approximate midpoint of the vowel (50% of the vowel duration). Zoom into this location and identify one period in the waveform.

- Report this value for the period and then compute F0 **using the period measure**.

- Ask Praat to calculate F1, F2, and F3 at this point as well.

- With these pieces of information, create a **schematic** line drawing of the vowel spectrum, with one vertical line representing each harmonic. This must have the following to receive full marks. See the Week 4 lecture slides for an example of what this can look like.

    - An x axis which allows you to show frequency in an accurate and legible way, and a reasonable range.

– The y axis can be totally schematic, and does not require actual intensity values - you can just label it to be 'louder' versus 'quieter', or similar.

– A clear representation of F1, F2, and F3, which also approximates standard vowel spectrum properties, e.g., declination in intensity at higher frequencies.

You can produce this in anyway that is easy to you. You could draw it by hand (graph paper would be helpful), take a picture or scan, and add it to your submission. Or, you can make it using e.g. powerpoint, or any other programme that let's you draw and/or manipulate shapes.

2.3.4 Advanced task

Consider other factors, including contextual that may influence vowel formant measures. If the two measures for a particular vowel are different consider why and discuss. Provide information about the tokens that you investigated, and the ways in which the factors you identify influence your interpretation of the patterns that you have observed.

3 Segmentation

3.1 Overview

In this exercise you will annotate a short audio file containing a recording of someone telling a story in Kazakh. Your task is first to segment the audio according to both voicing and oral closure, separate tiers of a TextGrid. Then, you will align the phonetic transcription of the speech to the segmentation you have created.

Remember: The text that you submit for this exercise must not exceed 2 pages. **Anything beyond 2 pages will be ignored** for marking purposes. This includes all text, figures, graphs, tables, references, and stretch materials, if any.

- Your entire portfolio submission should not exceed 10 pages.

If you need a refresher on how to identify and measure Formants and F0, you can consult the workshop on this topic from Week 4.

3.2 Materials

The materials for this exercise are available on Learn and consist of 1 audio file and a phonetic transcription. The data for this exercise is taken from the phonetic illustration of Kazakh in the *Journal of the International Phonetic Association*. A phonetic transcription of the data is provided in the paper, linked above, and reproduced for you here:

[**b r k n so tst k iel mien k n iek j w r a ndæ k əm mə t iek ienn ie ie   maj bæsek ielesied**]

This transcription has been simplified somewhat from the one provided in the full paper. The tie bars have been removed from diphthong vowels, along with diacritics that would indicate information about vowel length. In the original transcription, the 't', 'd', 'n', 's', 'l', and 'r' phones were modified by a diacritic that indicates they are produced at the teeth rather than the alveolar ridge. These diacritics have been removed for the purposes of this exercise. These changes should not affect your segmentations in any way, because you should be focused first on the acoustic events that are happening, and only then looking to align the transcription after the segmentation is completed.

3.3 Tasks

The "Core" section explains what you MUST do, while the "Advanced" section provides guidance if you would like to go further.

3.3.1 Core Tasks

Create a TextGrid with one tier for each segmentation type, being sure to label the tiers appropriately. Segment the provided audio according to two different sets of criteria:

- Voicing

- Oral closure

Align the phonetic transcription to each of the segmentations you have created in the TextGrid. Provide a screenshot of your annotations, making sure that they are legible on the page. You may need to split the annotation over two pages, and you may find it helpful to put image in landscape orientation. See the Week 8 workshop for examples and instructions.

3.3.2 Advanced Tasks

For this part you should focus only the first portion of the passage, that is:

[**b r k n**]

Based on the two text grids you have created, some boundaries will define boundaries corresponding to speech segments. Choose **two** such boundaries, and describe the following (a few sentences for each).

- What acoustic information in the spectrogram led you to place the boundaries where you did? Refer to specific frequencies and locations, describing, for example, acoustic information that you used to identify presence or absence of voicing, the onset of a vowel, etc.

- What acoustic information in the wave form led you to place the boundaries where you did? How does this relate to the spectrogram?

Comment briefly on the extent to which each representation was useful for both boundaries (in a few sentences).

4 Acoustics and connected speech

4.1 Overview

In this exercise you will reason about and analyse two waveform + spectrogram representations of speech.

Remember: The text that you submit for this exercise must not exceed 2 pages. **Anything beyond 2 pages will be ignored** for marking purposes. This includes all text, figures, graphs, tables, references, and stretch materials, if any.

- Your entire portfolio submission should not exceed 10 pages.

4.2 Materials

The materials for this exercise are available on Learn and consist of 2 visual spectrograms. The data for this exercise is taken from the HCRC Map Task Corpus.The first spectrogram was made from a careful word list production of a two-word phrase by a male speaker of Scottish English. The second spectrogram was made from a conversational production of the same phrase *within a sentence* by the same speaker.

The files are named as mystery-wordlist.pdf for the first, careful production, and mystery-connected.pdf for the file produced in a sentence.

4.3 Tasks

4.3.1 Core Tasks

Complete each of the below core tasks:

1. Identify where in the conversational spectrogram the target phrase begins and ends. Describe this using acoustic terminology. You may estimate the time points at which the phrase begins and ends from the scale provided in the spectrograms. You can also provide a screenshot with this interval highlighted.

2. Compare and contrast the sounds that are apparent in each production of the phrase. Are there any sounds that are missing or changed with respect to the word list item?

3. Name the major classes of speech sounds that occur in the phrase (e.g. consonant manner & voicing, place information if you can identify it).

4. Describe the relative vowel qualities present in the phrase. Be sure to use acoustic terminology in your description.

Note that it may help to try to visually segment the spectrograms, using the method introduced in week 8. This segmentation is not directly part of the task, but may help you to delimit and identify the various sounds as they occur.

4.3.2 Advanced task

What do you think the speaker is saying? Posit a possible phrase that is consistent with the acoustic information you have interpreted above. Discuss any possible alternatives to your proposed phrase, and explain why the acoustics are ambiguous, as relevant.

5 Phonology problems

5.1 Overview

In this exercise you will look at some phonetic and phonological data and use it to answer questions about phonemes, allophones, and phonological features.

Remember: The text that you submit for this exercise must not exceed 2 pages. **Anything beyond 2 pages will be ignored** for marking purposes. This includes all text, figures, graphs, tables, references, and stretch materials, if any.

- Your entire portfolio submission should not exceed 10 pages.

If you need a refresher on these concepts you can consult the lecture materials, readings, and workshop exercises from Week 9-10.

5.2 Tasks

The "Core" section explains what you MUST do, while the "Advanced" section provides guidance if you would like to go further.

5.2.1 Core Task 1: Phonemes and Allophones

Some information about the distributions of phonetic segments in a few languages is provided below. For each item, determine whether the target phones are allophones of the same phoneme or distinct phonemes, and justify your answers in a few sentences.

1. In some types of Southern Swedish, [ ] always appears at the beginning of a syllable, and [r] always at the end.

2. In Provençal, the word for 'evening' is [s o] and the word for 'saw' (noun) is [s ro].

3. In Plautdiitsch, [x] and [ç] appear in the following words: [axt] 'eight',[açt] 'real', [laxt] 'laughs', [laçt] 'lays'

5.2.2 Core Task 2: Features and classes

These are the sounds of a hypothetical language below

p	t	t	k	q	i		u
p	t	t	k	q	e		o
b	d	d	g				
f	s		x			a	
v	z						
m	n		ŋ				
w	l		j				

1. Assuming this inventory, and using the feature system from the textbook, list the features that are needed to select (all and only) the following classes of sound.

    1. fricatives
    2. high/close vowels
    3. velar stops
    4. voiced affricates
    5. glides/approximants
    6. only [ ] and no other sounds

2. Assuming the same inventory above, list the sounds that are selected by the following sets of features.

    1. [-voice,-continuant]
    2. [dorsal, +consonant]
    3. [+anterior]
    4. [round]
    5. [+delayed release, +voice]

5.2.3 Core Task 3: Examining distributions

Finally, your task to analyse the following data patterns in Japanese. Some of the consonants in the Japanese items below are in complementary distribution with each other, while others are not. List all of the consonants and the environments they occur in. Which of these phones are in complementary distribution with each other? (Note that symbols that appear beneath a tiebar, such as ts should be considered as one segment). To keep things simpler here, translations are not given (they're not relevant to solving the problem).

- For phones which appear in complementary distribution, posit an underlying form and state in prose the environments which result in the observed allophones.

se	tats me	tami	hat inohe	hamamats	ha imoto
himi	hitat i	hofu	mats ima	mine	minamata
motomat i	n mata	setana	init i	soto	s sa
tamana	tate	ts nami			

5.2.4 Advanced Task

Using what you have concluded from core task 3 above, write a phonological rule in the formal notation, which:

1. Posits an underlying form, and justifies the choice of underlying form.

2. Describes the transformation of the form into the observed allophones, defining a conditioning environment.

3. For the highest marks, use features where appropriate.