MSt/MPhil course: Phonetics and Phonology
Michaelmas Term 2018

John Coleman

NB Links to other documents relating to this course will be added incrementally as the course progresses. The plan below only sets out classes for 7 weeks, but in practice it tends to stretch out to take 8 weeks to deliver, so we'll see how it goes.

Reading list

Week 1: Why study phonetics? Respiration and airstream mechanisms

Introduction to Phonetics

In this course ...

The International Phonetic Alphabet

Speech vs. Writing

Respiration and air-stream mechanisms

Airstream mechanism exercises

Week 2: Phonation categories. Voice, tone, intonation, glottalization

The vocal tract and larynx

Phonation exercises

Week 3: Prosody 1: Pitch, Tone and Intonation

Pitch examples

Week 4: Articulation: Vowels and consonants

Place of articulation

Stricture

Place and manner exercises

Week n: Vowel classification in the IPA: Cardinal Vowels

Week m: Brain vs. mouth. Coarticulation, multiple articulation, assimilation.

Exercises


Exercises: Length contrasts

Holiday homework
MSt/MPhil Phonetics Reading List
Michaelmas Term 2018

Some useful books. Note that we won't be "following a coursebook", but items marked with an asterisk are especially recommended for purchase.


Week 1: Breathing: more on respiration and airstream mechanisms


**Weeks 2 and 3: Phonation, voice, tone, glottalization, intonation**


**Week 4: Vowels, consonants, categories, the (un)realities of segments and phonemes**


**Week n: Vowel features and systems; synharmonism**


**Week m: Brain vs. mouth**

Coarticulation, multiple articulation, assimilation
Lips and velum; distributed exponents of "voicing"


Introduction to Phonetics

1. What is phonetics? The (scientific?) study of speech. But why do we want to study speech?

2. The Primacy of Speech: speech is the primary way in which linguistic information is communicated between people. There are only two ways of linguistic communication that are natural (biological, independent of culture?): speech and sign (among the congenitally deaf and in some hunter-gatherer societies). Of these, speech is more widespread.

3. Naturalness of speech
   
   1 In history: for most of human history, writing did not exist. Writing is a comparatively recent social invention.

   2 In world society: languages with established writing systems are numerically a small minority. Most languages are unwritten (or were until this century).

   3 In human development: children without disabilities acquire speech as a natural human function, e.g. like walking or eating. It does not require explicit instruction, is biologically pre-programmed, and is achieved to an equal degree of mastery by everyone (though some become more eloquent in what they have to say than others!)

   4 In the development of literary languages: a literary language is a socially established forms of what was, at an earlier stage, merely one spoken dialect among many.

   5 In quantity of activity: most linguistic activity is in the spoken medium. Indeed, even among literate people, writing is a relatively rare activity.

4. The scope of the subject. The subject of phonetics covers all aspects of speech production, transmission, and reception, including:

   1 Planning: How people plan how they are going to control their organs of speech in order to say what they want to say. Usually studied by neurological and psychological methods, such as observation of brain-injured patients, subjects in psycholinguistic-style experiments, and imaging of brain function ("brain scanning").

   2 Articulatory phonetics: the organs of speech, the ways in which they may move and be coordinated with each other, and the possibilities for speech that this permits. These aspects can be observed to a certain extent by proprioception, assisted by training, as well as physiological and experimental studies.

   3 Acoustic phonetics: how air is set in motion, made to vibrate and how speech waves are transmitted between speakers. In transmission, speech acoustics may be studied in incredible detail just by careful listening, or with instruments, such as the microphone, and a small computer.

   4 Auditory phonetics and speech perception. Primarily based on psychological experiments and some physiological studies.
In this course (foundation course in phonetics) ...

... we shall study general articulatory phonetics.

**General** phonetics means that we shall study all the possible speech abilities that a speaker of any language might use in their speech. In other words, we shall not just study "the sounds" of individual languages. However, we shall consider various aspects of the phonetics of English and examples from many other languages where relevant during the course. You shall learn all of the symbols of the [International Phonetic Alphabet](http://web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm) (IPA), which is designed to be used in writing down the pronunciation of any language. We shall study various kinds of phonetic transcription, in various degrees of detail, for different purposes.

**Articulatory** phonetics means that we shall study the names and nature of the speaking organs and their role in speech. The symbols of the IPA are defined mostly in articulatory terms, and partly in acoustic terms.

After each lecture, you must **practise** the new sounds you have learned, by saying them aloud to yourself (in a private place, I suggest). By practising, you will become more sensitive to the position and motions of the organs of speech, including those which you are not normally used to using, and their auditory effects. If you do not practise, you will probably not get the hang of the IPA properly, which will only make the exam seem harder.

To help you practise, there are some **audio-visual resources**. There is a web-based guide to the sounds of the IPA at [http://web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm](http://web.uvic.ca/ling/resources/ipa/charts/IPAlab/IPAlab.htm). The sound clips on that site are taken from a tape recording/CD made at UCL and available from that department by mail order (details at [http://www.phon.ucl.ac.uk/home/wells/cassette.htm](http://www.phon.ucl.ac.uk/home/wells/cassette.htm)). A number of recordings of words in various languages are presented in my webpages/handouts for this course.

You cannot learn much about speech just from **books**: the practical training you will receive is essential in order to really understand the phonetics books.
THE INTERNATIONAL PHONETIC ALPHABET (revised to 2015)

**CONSONANTS (PULMONIC)**

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<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Labiodental</th>
<th>Dental</th>
<th>Alveolar</th>
<th>Postalveolar</th>
<th>Retroflex</th>
<th>Palatal</th>
<th>Velar</th>
<th><em>Uvular</em></th>
<th>Pharyngeal</th>
<th>Glottal</th>
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<tbody>
<tr>
<td>Plosive</td>
<td>p b</td>
<td>t d</td>
<td>t d</td>
<td>c j</td>
<td>k g</td>
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<td>Tap or Flap</td>
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<td>Fricative</td>
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<td>f v</td>
<td>θ δ</td>
<td>s z</td>
<td>s z</td>
<td>θ x y</td>
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<td>h ɔ</td>
<td>h ɔ h</td>
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<tr>
<td>Lateral fricative</td>
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<td>Lateral approximant</td>
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Symbols to the right in a cell are voiced, to the left are voiceless. Shaded areas denote articulations judged impossible.

**CONSONANTS (NON-PULMONIC)**

<table>
<thead>
<tr>
<th></th>
<th>Bilabial</th>
<th>Dental</th>
<th>Alveolar lateral</th>
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<tbody>
<tr>
<td>Clicks</td>
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<tr>
<td>Voiced implosives</td>
<td>โป</td>
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<tr>
<td>Ejectives</td>
<td>โป</td>
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<td>Examples:</td>
<td>โป</td>
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<tr>
<td>Voiced labial-velar approximant</td>
<td>โป</td>
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<tr>
<td>Voiced labial-velar fricative</td>
<td>โป</td>
<td></td>
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</tr>
<tr>
<td>Alveolar-velar fricative</td>
<td>โป</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OTHER SYMBOLS**

- "M" voiceless labial-velar fricative
- "C Z" Alveolar-palatal fricatives
- "V" voiceless labial-velar approximant
- "J" voiced alveolar lateral flap
- "H" voiceless epiglottal fricative
- "K" epiglottal plosive

**DIACRITICS** Some diacritics may be placed above a symbol with a descender, e.g. 樨

- "O" voiceless
- "Breathy voiced" รง ง
- "Dental" ต d
- "Voiced" .GetKey
- "Aspirated" ฮ h
- "More rounded" ว w
- "Less rounded" จ j
- "Advanced" ฎ r
- "Centralized" ฏ ฎ
- "Mid-centralized" ฌ j
- "Syllabic" น n
- "Non-syllabic" ญ y
- "Rhotic" ฅ ฅ

**TONES AND WORD ACCENTS**

**LEVEL**

- "Extra high" ระ
- "High" ระ
- "Mid" ระ
- "Low" ระ
- "Extra low" ระ

**CONTOUR**

- "Rising" ระ
- "Falling" ระ
- "Rising-falling" ระ
- "Global rise" ระ
- "Global fall" ระ
Respiration and air-stream mechanisms

1. Speech and air. Speech is a **disturbance of air pressure** which a speaker brings about by moving various parts of their body. (Speech is a kind of continuously controllable human sound. All sound is just disturbances of air pressure.)

   a) Take a deep breath and say "aaah!"

   b) Take another deep breath, hold your breath, and, **still holding your breath**, say "aaah!" again. (Impossible, see!)

   c) If you made a noise the second time, you were not really holding your breath (unless you have sprung a puncture).

   d) As you say "aaah", feel your chest "deflating". In order to speak, it is necessary to get the air in your body moving. This can be done just by breathing out.

   e) Can you say "aaah" while breathing in?

   f) As you say "aaah", feel your your throat, around the area of the larynx ("Adam's apple"). Can you feel the vocal cords "buzzing"?

   g) Now try **whispering** "aaah". Do the vocal cords buzz? The vocal cords modify the flow of air coming out of your lungs, but this modification is not necessary in order for you to hear "aaah". (Whispering is audible, after all.)

   h) Where does the air leave your body? Does it come out of your mouth? (Try holding your lips shut tight as you say "aaah!". Is it possible?) Try holding your nose shut? (Pinch the nostrils.) How does this affect the sound?

   i) Now say "bah!" a few times. Concentrate on the "b". Is there any air-flow out of your mouth and/or nose during the time in which your lips are closed for the "b"?

   j) Can you say "bah" while breathing in?

2. Respiration. There are not really any organs of speech as such: all of them originally evolved for other purposes, e.g. lungs for breathing, vocal cords for preventing choking, tongue for eating and tasting, nose for breathing and smelling, lips for eating. In the evolution of speech, we have adapted these organs for other purposes, namely in producing communicative noises.

3. Egressive and ingressive. The normal direction of airflow is called **egressive**. Speech produced by breathing in is called **ingressive**.

4. Some IPA symbols. The "aaah" sound is a **vowel**: in phonetics, the terms "vowel" and "consonant" refer to kinds of sound, not to letters. The IPA symbol
for the "aaah" sound is [æ]. Note that in the IPA, this is a distinct symbol from other "a"-like letters, such as [a]. "Baah" is written [ba]. "Daah" is written [da], and "gaah" is written [ga]. Note the shape of IPA [g]. The normal printed form of this letter, "g", is not usually used in the IPA, though it is a recognised variant of [g].

5. Implosives. A kind of sound like [b], [d], and [g] can be produced by sucking air into the mouth. Implosive [b], for instance, is made by holding the breath, closing the lips as for [b], and then sucking. (Do not purse the lips or allow your cheeks to be sucked in.) The sucking is done by closing the vocal cords together and so that the mouth cavity is completely shut off from the lungs.

As you suck in, the larynx is pulled down (feel it!), enlarging the size of the mouth cavity, without changing the amount of air in the mouth. This makes the air pressure inside the mouth lower than the air pressure outside your body. When you open your lips as for [b], the air rushes in to your lips, making an unusual ingressive sound. The ingressive forms of [b], [d] and [g] are called implosives. There are special letters for implosives, formed by adding a hook to the usual plosive symbols. For example, the velar implosive is transcribed [ɡɑ]. These other symbols are on the IPA chart, under "CONSONANTS (NON-PULMONIC).

PRACTISE

i) Observe and note:

- audible inbreaths
- audible exhalations (not during speech)
- something you hear someone say that you would not expect to see written down
- something you could not write down
- if it occurs, someone speaking on an ingressive airstream

ii) Practise egressive and ingressive speech. [ba], [da], [ga], [ɡɑ], etc. Try saying these with different vowels, e.g. [i] ("ee", as in "bee"), [u] ("oo" as in "boo!"). Observe yourself as you speak, by looking in a mirror. Note what it feels like as you breathe in and out, and as you speak using egressive and ingressive air.
The closest relatives to animals with heads are worms with gill slits. Shown are *Amphioxus* and a reconstruction of a fossil worm (*Haikouella*) over 530 million years old. Both worms have a notochord, a nerve cord, and gill slits. The fossil worm is known from over three hundred individual specimens from southern China.

The gill region of a developing human and a developing shark look the same early on.

If we follow the gill arches from an embryo to an adult, we can trace the origins of jaws, ears, larynx, and throat. Bones, muscles, nerves, and arteries all develop inside these gill arches.
Lung recordings (above: microphone, below: respiratory band)

1. Quiet respiration, audible outbreaths sinus rhythm

2. Altered exhalation with talking
Air-stream mechanism exercises

1. Pulmonic egressive

**English**

In the following, pulmonic, egressive air produced for a vowel ([a], [æ] or [ɑ]) is stopped ([ʔ], [t]) or constricted ([h], [h]) at the glottis ([ʔ], [h], [h]) or by the tongue tip at the alveolar ridge ([t]). [:] indicates length of the preceding sound.

at  [ʔaʔ]
are  [ʔæ]
art  [ʔaʔ] or [ʔæh]
tar  [tʰaː]

heart  [hæʔ]
uh-uh  [ʔəʔa]
a-a  [ʔaʔa]

2. Glottalic egressive (ejectives)

**Amharic**
p’ [p’ap’as] ‘church patriarch’
t’ [t’ut] ‘breast’
k’ [k’es] ‘priest’
s’ [s’om] ‘fast’ (n.)

**Navajo**
[t’áá] ‘just’ (adv.) [tooh] ‘large body of water’
[k’aaʔ] ‘arrow’ [ké] ‘shoe’
[ts’in] ‘bone’ [tsin sita] ‘mile’
[ts’aʔaʔ] ‘basket’ [tsah] ‘needle’

3. Glottalic ingressive (implosives)

**Sindhi**
[ɓar] ‘child’ [buʋ] ‘shoes’
[qar] ‘crevice’ [donu] ‘navel’
[ɠero] ‘heavy’ [gano] ‘song’

4. Velaric ingressive (clicks)

**Non-linguistic vocal sounds in English**

bilabial  ‘kiss kiss’ [ʘʘ]
dental  ‘tut tut’ [][[]
alveolar lateral  ‘gee up’ [][[]]
postalveolar  ‘tick tock’ ![ !]

**Xhosa**
[ukú|ola]  ‘to grind fine’
[ukú|oɓa]  ‘to break stones’
[ú|olo]  ‘peace’
[ukú| poɓa]  ‘to arm oneself’