Today’s video clip

• http://www.youtube.com/watch?v=2j4WMHYfDaA

• For Monday’s class, we will read an article on variation in Greeting formulae in Beirut. There’s a set of 3 questions that you need to respond to in written format on Monday.

What’s phonetics?

• Phonetics is the study of speech sounds in human language.
• In this class, we focus on articulatory phonetics: how speech sounds are articulated by the human vocal tract.
• We also learn the main symbols and diacritics used to transcribe human sounds in the International Phonetic Alphabet.
• We will focus first on the sound system of Classical Arabic (CLA), with occasional references to some of the features of the modern dialects.
• In a later session, we will discuss the phonetic features of the dialects in detail.

Consonants vs. Vowels

• There are two major types of sounds in human language: consonants and vowels. How do they differ?
• In terms of articulation, consonants are produced when the airflow is obstructed in the vocal tract, while vowels are produced with relative free flow of the airstream in the vocal tract.
• Both consonants and vowels can be described in terms of a number of individual articulatory features.
• We start with consonants.
Articulation of Classical Arabic consonants

- Consonant sounds are described according to three main phonetic properties:
  a) Place of articulation
  b) Manner of articulation
  c) Voicing
- In addition, some Arabic consonants are described in terms of a fourth feature:
  d) Emphaticness

Bilabial consonants

- Bilabial consonants are produced with both lips.
- In Classical Arabic, there are three bilabials:
  - [b] as in باب
  - [m] as in مريض
  - [w] as in ولد

Labiodental consonants

- Labiodental consonants are produced with the upper teeth and the lower lip.
- Classical Arabic has only one such consonant:
  - [f] as in فرصة
- In MSA and the modern dialects, the non-Arabic consonant [v] now appears in foreign borrowings such as فيزا and فازلين.

Interdental consonants

- Interdental consonants are produced with the tip of the tongue between the upper and lower teeth.
- There are three interdentals in Classical Arabic:
  - [θ] as in ثقافة
  - [ð] as in ثُرة (‘corn’)
  - [ð'] as in ظُهر

Alveolar consonants

(also described as dental consonants)

- Alveolar consonants are produced when the front part of the tongue is in touch with the alveolar ridge, the area just behind the upper teeth.
- There are several alveolar consonants in Classical Arabic:
  - [t] as in تخرج
  - [d] as in دخول
  - [s] as in سباحة
  - [n] as in نهار
  - [z] as in زعانف

Alveo-palatal consonants

- Alveo-palatal consonants are produced when the front part of the tongue touches the alveolar ridge and then the hard palate (that part of the mouth which is just behind the alveolar ridge).
- There are two alveo-palatal consonants in Classical Arabic:
  - [ʃ] as in شمس
  - [ʒ] as in جيد
- In MSA and the modern dialects, the alveo-palatal consonant [ʒ] appears in foreign borrowings such as بيجو and كراج.
Palatal consonants

- **Palatal** consonants are produced when the front part of the tongue raises towards the palate.
- Classical Arabic has only one palatal consonant: 
  - [j] as in يوم

Velar consonants

- Velar consonants are produced by raising the back part of the tongue towards the velum.
- Classical Arabic has three velar consonants: خ/غ/ك
  - [x] as in خضار
  - [ɣ] as in غريب
  - [k] as in كم
- As we’ll discuss next week, the modern dialects have another velar sound now, the [ɡ] (e.g., in the Egyptian Arabic word جمل).

Uvular consonants

- **Uvular** consonants are produced by raising the back of the tongue towards the uvula.
- There is only one uvular consonant in Classical Arabic: ق
  - [q] as in قريب

Pharyngeal consonants

- **Pharyngeal** consonants are produced at the pharynx.
- There are two pharyngeals in Classical Arabic:
  - [ʔ] as in حادة
  - [ʕ] as in عُمْر

Glottal consonants

- **Glottal** consonants are produced at the glottis.
- Classical Arabic has two glottal consonants: ه/ه
  - [ʔ] as in أسرة
  - [h] as in هذا

Manner of articulation

- Speech sounds are also differentiated by the way the airflow is affected as it travels from the lungs up and out of the mouth and nose. This is referred to as the manner of articulation for the sound.
### Stops (aka plosives)

- **Stops**: These are produced by a complete obstruction of the airflow in the mouth, e.g., [b], [t], [tʰ], [d], [dʰ], [k], [q], and [ʔ].

- When the air escapes through the nasal, rather than the oral, cavity, **nasal stops** are produced, e.g., [m] and [n].

### Fricatives

- **Fricatives**: These are produced by a partial obstruction of the airflow, where the passage in the mouth through which the air escapes is very narrow, causing friction, e.g., [f], [s], [sʰ], [z], [θ], [ð], [ðʰ], [ʃ], [x], [ɣ], [h], [ʕ], and [h].

### Affricates

- **Affricates**: These are produced by a stop closure followed immediately by a slow release of the closure characteristic of the fricative.

- Classical Arabic has only one affricate: [dʒ].

- Some of the dialects, though, have [tʃ] and some have [ts].

### Liquids (aka Approximants)

- **Liquids**: In the production of these sounds, there is some obstruction of the airflow in the mouth, but not enough to cause any real constriction or friction, e.g. [l].

- [l] is called a lateral approximant, because the air escapes through the sides of the tongue.

### Trill

- A trill is produced by vibrations between the front part of the tongue and the alveolar ridge.

- The Classical Arabic [r] is a trill.

### Glides (aka Semi-vowels)

- **Glides**: These are produced with little or no obstruction of the air in the mouth, e.g., [j] and [w].

- When occurring in a word, they must always be either followed or preceded by a vowel, and in their articulation the tongue moves rapidly in a gliding fashion either toward or away from a neighboring vowel.
Voicing

- Consonant sounds are also divided into two types, **voiced** and **voiceless**, based on whether they are produced with or without vibration of vocal cords. For example:
  - [d], [z], [x], and [ʕ] are voiced.
  - [t], [s], [y], and [h] are voiceless.

Emphaticness

- Emphatic consonants in Arabic are produced with a secondary articulation in which the back of the tongue is raised towards the velum. This is why emphaticness is often described as a velarization process. Since there is a constriction at the top of the pharynx, emphaticness is also considered pharyngealization.

  - Emphatic consonants in Classical Arabic are: صضطظ
  - Their non-emphatic counterparts are: سدتذ

Emphatic spread

- Four other consonants induce emphatic spread to neighboring vowels:
  - [q] became ص ื
  - [x] (walked) ض ى
  - [ɡ] (harmful) ض ى
  - [ɣ] (pilot) ض ى
  - [r] (remained) ظ ى

Describing consonants

- A consonant can thus be described in terms of three parameters: place of articulation, manner of articulation, and voicing. In addition, some consonants are emphatic.

  - For example,
    - [b] is a bilabial, voiced stop.
    - [s] is an alveolar, voiceless fricative.
    - [sʰ] is an alveolar, voiced, emphatic fricative.

  - Now, describe [f], [m], [d̪], [h], and [r].

Classical Arabic consonant chart using the IPA symbols

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- [b] is a bilabial, voiced stop.
- [s] is an alveolar, voiceless fricative.
- [sʰ] is an alveolar, voiced, emphatic fricative.
http://www.uiowa.edu/~acadtech/phonetics/#

• Link for the articulation of the consonants of American English, German, and Spanish. No Arabic, unfortunately. Still, pretty useful to see how consonants are articulated.

Vowels

• Vowels are distinguished from consonants in that the passage through which the air travels is never so narrow as to obstruct the free flow of the airstream.

• It’s hard, however, to characterize vowels according to the same features that we have used in characterizing consonants. Why?

Parameters for vowel articulation

• Therefore, to distinguish between different vowels, we rely on four other features:
  (a) Tongue height: High, Mid, and Low
  (b) Which part of the tongue is involved: Front, Central, and Back
  (c) Lip rounding: Rounded and Unrounded
  (d) Tenseness or laxness of the vocal tract: Tense and Lax

American English Vowel Chart

American English Vowel Chart (from O’Grady et al 2005)

Figure 2.9 American English vowels (tense vowels are circled)

Classical Arabic vowel chart
Arabic dialects vowel chart

Arabic diphthongs

- [aj]: بيت [bajt]
- [aw]: جو [dʒaww]

http://www.uiowa.edu/~acadtech/phonetics/

- Same link from earlier for the articulation of the vowels of American English, German, and Spanish.
- This is a link for an interactive IPA chart, where you can listen to each possible sound in human language. It’s fun.
- http://wso.williams.edu/~jdowse/ipa.html

Next class agenda

- Arabic phonology cont. Finish reading the O’Grady et al’s chapter.
- Also, a quick discussion of Germanos’ article on Greetings in Beirut.