What Is Phonetics?
Phonetic Transcription
Articulation of Sounds

Phonetics

Darrell Larsen

Linguistics 101
What Is Phonetics?

Phonetic Transcription
- Phonetic Alphabet
- Transcription

Articulation of Sounds
- Articulation of Consonants
- Articulation of Vowels
- Other Languages
What Is Phonetics?

**Definition**
the study of speech sounds

**The Branches of Phonetics**
1. acoustic (the physics of sound)
2. auditory (how the ear processes sound)
3. articulatory (how we produce speech sounds)
We will examine the following questions:

- How can we accurately transcribe speech sounds?
- What speech organs are involved in speech production?
- How do we manipulate the flow of air to produce sounds?
Why Do We Need a Phonetic Alphabet?

- Linguists use a phonetic transcription system to record speech sounds.
- In this class, we will use the International Phonetic Alphabet (IPA)

**Question**

Why not just use the Roman alphabet?
Why Do We Need a Phonetic Alphabet?
Why Do We Need a Phonetic Alphabet?

<table>
<thead>
<tr>
<th>English</th>
<th></th>
<th>Czech</th>
</tr>
</thead>
<tbody>
<tr>
<td>⟨c⟩</td>
<td>[k]</td>
<td>⟨c⟩</td>
</tr>
<tr>
<td>cat</td>
<td>cord</td>
<td>co</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Václav</td>
</tr>
<tr>
<td></td>
<td></td>
<td>třicet</td>
</tr>
</tbody>
</table>
**Why Do We Need a Phonetic Alphabet?**

[\langle a \rangle]

<table>
<thead>
<tr>
<th>ball</th>
<th>sand</th>
<th>make</th>
</tr>
</thead>
</table>

[\langle t \rangle]

<table>
<thead>
<tr>
<th>tall</th>
<th>stop</th>
<th>later</th>
<th>patience</th>
<th>train</th>
</tr>
</thead>
</table>
Why Do We Need a Phonetic Alphabet?

\[
\langle ea \rangle \quad \text{health} \\
\text{wealth} \\
\text{stealth}
\]

\[
\langle ck \rangle \quad \text{back} \\
\text{bucket} \\
\text{cracked}
\]
Why Do We Need a Phonetic Alphabet?

\[ \langle e \rangle \ \text{late} \]
\[ \langle h \rangle \ \text{hour} \]
\[ \langle k \rangle \ \text{knee} \]

\[ \langle e \rangle \ \text{science} \]
\[ \langle h \rangle \ \text{blah \ blah \ blah} \]
\[ \langle k \rangle \ \text{knife} \]
**Why Do We Need a Phonetic Alphabet?**

<table>
<thead>
<tr>
<th>English Vowel Letters</th>
<th>English Vowel Sounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>⟨a, e, i, o, u⟩</td>
<td>beat</td>
</tr>
<tr>
<td></td>
<td>bet</td>
</tr>
<tr>
<td></td>
<td>but</td>
</tr>
<tr>
<td></td>
<td>*bird</td>
</tr>
<tr>
<td></td>
<td>bow</td>
</tr>
<tr>
<td></td>
<td>bike</td>
</tr>
<tr>
<td></td>
<td>boat</td>
</tr>
</tbody>
</table>
INTERNATIONAL PHONETIC ALPHABET (IPA)

ABOUT THE IPA

- Contains symbols to represent all sounds from all languages
- 1-to-1 correspondence between sounds and symbols
- Includes diacritics to indicate tone, stress, etc.
- Many symbols from or based on Latin and Greek alphabets
- Not the only phonetic alphabet in use
What Is Phonetics?

Phonetic Transcription
Articulation of Sounds

INTERNATIONAL PHONETIC ALPHABET (IPA)
IPA PULMONIC CONSONANT CHART

CONSONANTS (PULMONIC)

<table>
<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>Uvular</th>
<th>Pharyngeal</th>
<th>Glottal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plosive</td>
<td>p</td>
<td>b</td>
<td>t</td>
<td>d</td>
<td>t</td>
<td>d</td>
<td>c</td>
<td>j</td>
<td>k</td>
<td>q</td>
<td>g</td>
</tr>
<tr>
<td>Nasal</td>
<td>m</td>
<td>m</td>
<td>n</td>
<td></td>
<td>η</td>
<td>η</td>
<td>η</td>
<td>j</td>
<td>η</td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>Trill</td>
<td>b</td>
<td></td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R</td>
<td></td>
</tr>
<tr>
<td>Tap or Flap</td>
<td>v</td>
<td></td>
<td>r</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fricative</td>
<td>φ</td>
<td>β</td>
<td>f</td>
<td>v</td>
<td>θ</td>
<td>ð</td>
<td>s</td>
<td>z</td>
<td>f</td>
<td>h</td>
<td></td>
</tr>
<tr>
<td>Lateral</td>
<td></td>
<td></td>
<td>f</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximant</td>
<td></td>
<td></td>
<td>v</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lateral</td>
<td></td>
<td></td>
<td>l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Where symbols appear in pairs, the one to the right represents a voiced consonant. Shaded areas denote articulations judged impossible.

Full IPA chart available at: http://www.langsci.ucl.ac.uk/ipa/IPA_chart_(C)2005.pdf

*Note that Language Files has slightly different categories in some cases. We will follow the book.*
### Transcriptions

<table>
<thead>
<tr>
<th>English</th>
<th>Phonetic Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘ways’</td>
<td>[weɪz]</td>
</tr>
<tr>
<td>‘achieve’</td>
<td>[ətʃi:v]</td>
</tr>
<tr>
<td>‘use’</td>
<td>[jʊs]</td>
</tr>
<tr>
<td>‘Sprite’</td>
<td>[spraɪt]</td>
</tr>
<tr>
<td>‘energetic’</td>
<td>[ɛnədʒɪrɛk]</td>
</tr>
<tr>
<td>‘cowboy’</td>
<td>[kʰɔubɔɪ]</td>
</tr>
<tr>
<td>‘that’</td>
<td>[ðæt]</td>
</tr>
<tr>
<td>‘spelling’</td>
<td>[spɛliŋ]</td>
</tr>
<tr>
<td>‘pudding’</td>
<td>[pʰʊrɪŋ]</td>
</tr>
</tbody>
</table>

### Free Variation

- In some instances, there can be some variation in the pronunciation.
- ‘cat’ [kʰæt] or [kʰætʰ] or [kʰæʔ]
Some English sounds are *aspirated* in certain environments.

**Transcriptions**

<table>
<thead>
<tr>
<th>Word</th>
<th>Transcription</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘pet’</td>
<td>[pʰɛt]</td>
</tr>
<tr>
<td>‘bet’</td>
<td>[bɛt]</td>
</tr>
<tr>
<td>‘spot’</td>
<td>[spat]</td>
</tr>
<tr>
<td>‘whip’</td>
<td>[wɪp]</td>
</tr>
<tr>
<td>‘tea’</td>
<td>[tʰi]</td>
</tr>
<tr>
<td>‘deep’</td>
<td>[dɪp]</td>
</tr>
<tr>
<td>‘stuck’</td>
<td>[stʌk]</td>
</tr>
<tr>
<td>‘sat’</td>
<td>[sæt]</td>
</tr>
<tr>
<td>‘cat’</td>
<td>[kʰæt]</td>
</tr>
<tr>
<td>‘gift’</td>
<td>[ɡɪft]</td>
</tr>
<tr>
<td>‘scar’</td>
<td>[skɔr]</td>
</tr>
<tr>
<td>‘beak’</td>
<td>[bɪk]</td>
</tr>
</tbody>
</table>

**Question**

- Which sounds in English can be aspirated?
- What do these sounds have in common?
- In which phonetic environment(s) are these sounds aspirated?
What we spell with ⟨t⟩, ⟨tt⟩, ⟨d⟩, ⟨dd⟩ is often not [t] or [d], but rather the flap [r].

**Question**

In which phonetic environment(s) does the flap appear?
Phonetic transcriptions are written in square brackets [ ].

Transcribe words based on *sound*, not spelling.

Don’t use a schwa ([ə]) in stressed syllables.

Upper- and lowercase letters are *not* interchangeable.

Some morphemes, like past tense *-ed*, are not always pronounced the same.

When a syllable lacks a vowel, be sure to use a syllable marker (e.g. ‘kitten’ [kʰɪʔn])
The articulation of consonants involves the complete or partial constriction of airflow within the vocal tract.

**Distinguishing Features of English Consonants**

1. place of articulation  
   (place of airflow obstruction)
2. manner of articulation  
   (manner of airflow obstruction)
3. voicing  
   (vibration/nonvibration of vocal cords)

Charts are available on the back cover or your book. Be sure to note the additions I make.
**Places of Articulation**

Source: [Bergmann et al., 2007, p. 49]

Source: [Ladefoged & Maddieson, 1996, p. 13]
Places of Articulation

Places of Articulation Used in English

1. bilabial
2. labiodental
3. interdental
4. alveolar
5. postalveolar
6. palatal
7. velar
8. glottal
## Manners of Articulation Used in English

<table>
<thead>
<tr>
<th>Manners of Articulation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. plosive (= stop)</td>
<td></td>
</tr>
<tr>
<td>2. fricative</td>
<td></td>
</tr>
<tr>
<td>3. affricate</td>
<td></td>
</tr>
<tr>
<td>4. flap *</td>
<td><em>(add this row to your book’s chart!)</em></td>
</tr>
<tr>
<td>5. nasal</td>
<td></td>
</tr>
<tr>
<td>6. liquid (lateral and retroflex)</td>
<td></td>
</tr>
<tr>
<td>7. glide</td>
<td></td>
</tr>
</tbody>
</table>
Voicing Parameters Used in English

1. voiced (vibration)
2. voiceless (no vibration)
Vowels are produced with a relatively open vocal tract, lacking any significant constriction.

**Distinguishing Features of English Vowels**

1. height
2. tongue advancement
3. tenseness

**Additional Vowel Features**

- lip rounding
What Is Phonetics?

Phonetic Transcription

Articulation of Sounds

Articulation of Consonants

Articulation of Vowels

Other Languages

**Height**

- Refers to the relative height of the relevant part of the tongue
- Vowels may be:
  1. high
  2. mid
  3. low
Tongue Advancement

- Refers to relative advancement of the tongue body
- Vowels may be:
  1. front
  2. central
  3. back
TENSENESS

- Refers to relative tenseness of the lip and/or tongue muscles
- Vowels may be:
  1. tense
  2. lax
Lip Rounding

- Refers to whether the lips are rounded or unrounded
- Vowels may be:
  1. rounded
  2. unrounded
- English has rounded and unrounded vowels, but lip rounding is not a distinguishing feature in English.
Monophthongs are simple vowel sounds.

Excluding [e] and [o], American English contains the following monophthongs:

(Add [e] and [o] to your book’s chart. You will need to know their features.)
Monophthongs are complex vowel sounds, transitioning from one vowel to another.

American English contains the following diphthongs:
The set of distinctions listed above is not comprehensive.
The distinctions found in English are not relevant in all languages. For example,
- Spanish and Korean have no *tenseness* distinction for vowels
- Japanese and Korean have no *labiodental* consonants

Other languages may have distinctions that English lacks. For example,
- *Lip rounding* is distinctive for vowels in French and German
- Vietnamese contains *implosive* consonants
- Khoisan languages (spoken in southern Africa) contain *clicks*
- Chinese and Thai contain *tones*