Review: classification of segments

• Sound waves are continuous, but in many ways we perceive speech in terms of **segments**.

• Segments can be classified according to the way in which they are produced in the vocal tract.

**Segment inventories**

• Languages have different inventories of segment types.

• There are two ways in which languages can differ:
  - Segment **types**: the use/non-use of certain phonetic types/dimensions.
  - Segment **contrasts**: differences in the way phonetic dimensions are exploited.

**Differences of type (**loại hình**)**

• Certain types of segments are only used by some languages.
  - clicks (Southern African languages)
  - pharyngealised consonants (e.g. Arabic)
  - interdental fricatives (e.g. English, Spanish, Greek)
  - front rounded vowels (e.g. German, French)
  - ejectives (e.g. Georgian, Quechua)
Differences of contrast (tương phản)

• These differences are conspicuous, but superficial (sơ lược).

• More fundamental differences occur between what counts as different in a language. This is the concept of contrast (tương phản).

<table>
<thead>
<tr>
<th>English</th>
<th>ba</th>
<th>pa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thai</td>
<td>ba</td>
<td>pa</td>
</tr>
</tbody>
</table>

- These languages make different distinctions along the same phonetic dimension.

- Universally, we can talk of a “voiceless bilabial stop”

- But for Thai, it’s important to also specify whether it’s aspirated or unaspirated.

- In English, it’s not quite so important.

Language-specific distinctions

From the point of view of a non-native speaker, many of these distinctions can be extremely subtle.

Polish distinguishes [ɕ] and [ʃ]  
[ʐ] and [ʂ]  
‘kasiarz’ [kaçar]  
English distinguishes [si] and [ʃi], which may be difficult for Greek or Japanese speakers.

Language acquisition

• These differences present difficulties for L2 learners...

• But also for L1 learners:
  ▶ What are the categories?
  ▶ What counts as ‘different’ in my language?
• Contrastive sound categories are called phonemes.

• Phonemes are the smallest units in a language that distinguish word meanings (đơn vị nhỏ nhất được dùng để phân biệt nghĩa của từ).

• Phonemes are abstract segments (âm đoạn trừu tượng).

There are some problems with the idealisation of a phoneme, but the concept is surprisingly useful.
Since we can find minimal pairs differing only between [d] and [t], we say that this difference is **contrastive** in English (*tương phản*).
Minimal pairs in English

<table>
<thead>
<tr>
<th>[p]</th>
<th>[pʰ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin</td>
<td>spin</td>
</tr>
<tr>
<td>[pʰin]</td>
<td>[spin]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>[p]</th>
<th>[pʰ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>pat</td>
<td>spat</td>
</tr>
<tr>
<td>[pʰat]</td>
<td>[spat]</td>
</tr>
</tbody>
</table>

Since we can’t find any minimal pairs differing only in [p] and [pʰ], we conclude these sounds are not contrastive in English.

Why abstraction?

One reason for using phonemes is because their precise phonetic realisation can often be predicted on the basis of

- social variation
- regional dialect
- phonological environment.

Exercise: phonetic variation

- Say the following words aloud, paying particular attention to the place of articulation of the final sounds:

  - ech  óc
  - uóc  Úc
  - anh  ông
  - úng  ương
Exercise: phonetic variation

• Say the following words aloud, paying particular attention to the place of articulation of the final sounds:

ếch [ek]  ốc [ㄛkʰ]
uốc [ʊəkʰ]  Úc [ʊkʰ]
anh [ẹŋ]  ống [oŋm]
ung [ʊŋ]  ung [ʊŋm]

Phân bố của hai biến thể là gì?

Exercise: phonetic variation

• Say the following phrases aloud, paying particular attention to the place of articulation of the N sounds:

1. in a
2. in the
3. the men think
4. the men do
Exercise: phonetic variation

- Say the following phrases aloud, paying particular attention to the **place of articulation** of the N sounds:

  1. in a
  2. in the
  3. the men think
  4. the men do

[ɪn ə] → [ɪn ə]

[ɪn ə] → [ɪn ə]

[ɪn ə] → [ɪn ə]

[ɪn ə] → [ɪn ə]

[ʰə mɛn θɪŋk] → [ʰə mɛn θɪŋk]

[ʰə mɛn θɪŋk] → [ʰə mɛn θɪŋk]

[ʰə mɛn θɪŋk] → [ʰə mɛn θɪŋk]

[ʰə mɛn θɪŋk] → [ʰə mɛn θɪŋk]
Systematic phonetic variation

• Much phonetic variation doesn’t produce minimal pairs, but is an automatic consequence of the phonetic environment.

• It is systematic and predictable.

Labiovelars [ kp, ηm ] occur before rounded vowels
Plain velars [ k η ] occur everywhere else

Systematic phonetic variation

• Much phonetic variation doesn’t produce minimal pairs, but is an automatic consequence of the phonetic environment.

• It is systematic and predictable.

Dental [ n ] occurs before fricatives
Alveolar [ n ] occurs everywhere else

Complementary distribution

If the phonetic differences between two sounds are systematic and predictable, then they never contrast, because their distributions differ.

• We say these variants are in complementary distribution ( phán bổ bổ sung ).

• The variants of a phoneme are called allophones ( tha âm vị ).

<table>
<thead>
<tr>
<th>[p]</th>
<th>[pʰ]</th>
<th>[n]</th>
<th>[ŋ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin</td>
<td>spin</td>
<td>in a</td>
<td>in the</td>
</tr>
<tr>
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<td>[n]</td>
<td></td>
</tr>
<tr>
<td>pin</td>
<td>spin</td>
<td>in a</td>
<td>in the</td>
<td></td>
</tr>
</tbody>
</table>

**Allophonic variation: Korean**

In which environment does each variant occur?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>[l]</td>
<td>[r]</td>
</tr>
</tbody>
</table>

| [kal] | it'll go | [irũmi] | name |
| [kũnuũl] | shade | [kri] | road |
| [ilkop] | seven | [kũɾəm] | then |
| [onũũlppũũm] | tonight | [kariro] | to the street |
| [pal] | leg | [uri] | we |
| [pʰal] | arm | [saram] | person |

Allophones:

```
/ⁿ/
```

**Allophonics variation: Korean**

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Japanese /r/

In Japanese the phoneme /r/ has several variants:

<table>
<thead>
<tr>
<th>Variant</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>alveolar tap ((getClass)(vō))</td>
<td>[r]</td>
</tr>
<tr>
<td>palatalised tap</td>
<td>[r]</td>
</tr>
<tr>
<td>lateral approximant</td>
<td>[l]</td>
</tr>
</tbody>
</table>

- The different variants do **not** signal different meanings.
- The variation is **not** predictable from the context.

The allophones are not in complementary distribution, but in free variation (*biến thể tự do*).

Language specificity

- In English, [l] and [r] are **phonemes**: they can distinguish minimal pairs, e.g. *leaf* [liːf] and *reef* [riːf].
- In Japanese, [r] and [l] do not contrast, but their distribution is **not** predictable: they are allophones in free variation.
- In Korean, [l] and [r] do not contrast either, but their distribution is predictable: they are allophones in complementary distribution.

Goals of phonology

- A major concern of phonology is sorting out the relationship between specific phonetic segments and the abstract mental constructs (the phonemes).
- In Korean, [l] and [r] are fundamentally “the same thing”, but each is realised in a different environment.
- Likewise for English [n] and [ŋ]...
- ...or Vietnamese [k] and [kp].

...
Summary

- **Contrast** is the key to understanding phonological systems of languages

- Every language has a specific inventory of sound categories, or **phonemes**, distinguished by **minimal pairs**.

- Variants of a phoneme are called **allophones**.