

Overview of topics

1. What is Phonology
2. Phonotactics
3. Phonemes
4. Phonological rules
5. Kinds of phonological rules

1 What is Phonology

Phonology:

- studies how sounds are organized in particular languages
- tries to discover the psychological patterns and underlying organization of sounds shared by native speakers of a certain language.

2 Phonotactics

Phonotactics studies what kind of sound patterns (sound combinations) are in a particular language and which are not.

For example, certain languages do not allow consonant clusters (CV syllables). Interesting things happen with borrowings from other languages:

Japanese:

besuboru – *baseball*
gorufurendu – *girlfriend*

sutoraiiku – *strike*
arubaito – *job* (German *Arbeit* [arbat])

Setswana (Botswana):

kirisimasi – *Christmas* *gelase* – *glass* *hafu* – *half*

Shona (Southern Bantu language, Zimbabwe, replacing [l] with [r]): Strictly CV (C cannot even be word final)

turoko – *truck*
furusitopi – *full stop*
sitirecha – *stretcher*
hendibhegi – *handbag*
kanduro – *candle*

puruvhu – *proof*
bhirifi – *brief*
giramu – *gram*
kirimu – *cream*
chitofu – *stove*

3 Phonemes

It is sometimes difficult for native speakers of a language to tell the difference between sounds which may be completely distinctive for speakers of another language.

- (1) a. English: *pit* [p^hɪt] vs. *spit* [spɪt]
b. Hindi: [p^hu:l] (fruit) vs. [pu:l] (moment)
 - English speakers consider [p] and the [p^h] to be the same sound, despite some irrelevant articulatory details.
For Hindi speakers, the same details are enough to completely differentiate the two sounds, making them as different as [p] and [b] for English speakers.
 - In English, [p] and [p^h] are called variants (allophones) of the same **phoneme** /p/.
In Hindi, [p] and [p^h] are two distinct phonemes – /p/ and /p^h/

You can think about phonemes as the stuff in your head, and phones as the real stuff you say. You know there is a /p/ in both *pit* and *spit*, but you pronounce [p^h] in *pit* and [p] in *spit*.

So phonetics studies how sounds really sound, while phonology studies how they sound to speakers of some language.

Note:

- [] are used when capturing sounds in phonetics (encoding all the details)
- / / are used when capturing phonemes in phonology (disregarding details not relevant for a particular language)

Two sounds are called variants (allophones) of a single phoneme if:

- speakers of that language consider them to be one sound
- we can predict which one will be pronounced in a certain context (e.g. [p^h] word initially, [p] otherwise); or we can say the choice is free

- (2) a. English: *see* [si] vs. *she* [ʃi]
b. Japanese: *saru* [sarʊ] (monkey), *shiru* [ʃiru] (to know)

- In English, [s] and [ʃ] are not allophones of the same phoneme, because there are words that are distinguished just by these two sounds: (e.g. *see* [si] and *she* [ʃi])
- In Japanese, [s] and [ʃ] are allophones of the same phoneme, because there are no words distinguished just by these two sounds. In [-aru] we must choose [s] (*saru* = monkey), but in [-iru] we must choose [ʃ] (*shiru* = to know).
Before any vowel except [i], only [s] can occur; [ʃ] occurs in all other contexts.

Different languages behave phonologically differently – they have different sets of phonemes and phonemes have different variants.

In English, /t/ has several variants (allophones) – [t], [t^h], [ɾ] and [ʔ]:

	top	stop	little	kitten
(3) phonology:	/tʌp/	/stʌp/	/lɪtl/	/kɪtn/
phonetics:	[tʰʌp]	[stʌp]	[lɪrtl]	[kɪʔn]

The best way to find out whether two sounds are two distinct phonemes, or just variants of a single phoneme, is to try to find a **minimal pair** – words that are distinguished only by these phones. If you find it, the sounds are *not* variants of a single phoneme.

[tʃ] vs. [dʒ]: *chin* [tʃɪn] vs. *gin* [tʃɪn]

[p] vs. [pʰ]: There is no such pair

4 Phonological Rules

Phonological rules translate phonemes to the real sounds (phones).

- (4) a. /pɪt/ → [pʰɪt]
 b. /spɪt/ → [spɪt]

So we can say:

- (5) a. /p/ → [pʰ] at the beginning of the word
 b. /p/ → [p] otherwise (rules like this are usually omitted)

We can also state similar rules for /t/ and /k/:

- (6) a. /t/ → [tʰ] at the beginning of the word
 b. /k/ → [kʰ] at the beginning of the word

However, /p/, /t/ and /k/ are all English voiceless stops, therefore we can write just one general rule:

- (7) voiceless stop → aspirated at the beginning of the word

Or in a more "scientific" way:

- (8) [-voiced, +stop] → [+aspirated] / # __

Note: # marks word boundary (# __ means word initially, __ # means word finally)

English has many rules like this. Some rules all English speakers share; some are used only by some speakers. Some of them occur always, some only in fast speech, etc.

In these rules we can refer to classes of phonemes like:

- voiced consonants ([b, d, g, ð, z, dʒ, n, m, ŋ, ...]),

- rounded vowels ([u, ʊ, o, ɔ]),
- nasals ([m, n, ŋ]),
- sibilants (hissy sounds [s, z, ʃ, ʒ, tʃ, dʒ]),
- etc.

In German, all word-final consonants become unvoiced:

- (9)
- | | | | | | |
|----|---------|---|---------|--------------|--------|
| a. | /hund/ | → | [hʊnt] | <i>Hund</i> | (dog) |
| b. | /hunde/ | → | [hʊndə] | <i>Hunde</i> | (dogs) |
| c. | /tag/ | → | [tak] | <i>Tag</i> | (day) |
| d. | /tage/ | → | [tʰagə] | <i>Tage</i> | (days) |

The rule:

(10)

5 Kinds Of Phonological Rules

Different languages have different rules, however there are some some typical kinds of rules that are very common:

- **Assimilation** – a process by which a sound becomes more like a nearby sound.

- *bit* [ɪ] vs. *bin* [ɪ̃] – /ɪ/ assimilates to the following /n/ (nasal) → [ɪ̃]
- *comfort* [kʌmfɔrt] – /m/ can assimilate to /f/ (labiodental) → [mf]
- *because you* [bɪkəʒju] – /z/ can assimilate to /j/ (palatal) → [ʒ]

Reason: easier to pronounce; the assimilation level depends on speakers and situation

- **Dissimilation** – the opposite of assimilation, two nearby sounds become less alike.

- In Latin, suffix *-alis* changes to *-aris* when it is added to a word containing [l].
These words came into English as adjectives ending in *-al* or *-ar*.
-al: *anecdotal*, *annual*
-ar: *angular*, *annular*

Here the change is even reflected in spelling.

- **Insertion** – a new sound is inserted.

- *prince* /prɪns/ → [p^hrɪnts]: [t] can be inserted
- *hamster* /hæmstɜr/ → [hæmpstɜr]: [p] can be inserted

- **Deletion** – a phoneme is not pronounced in certain environments

- *okay* [okeɪ] → [ʔkeɪ], *Toledo* [tələɪdow] → [tlɪdow]

Reason: easier and faster to say

Rules may be **obligatory** (all speakers do it; e.g. nasalization of vowels in English) or **optional** (sometimes or some speakers do it; e.g. alveolar stop assimilation)