Intro to Linguistics – Phonology

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Overview of topics

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

What to remember/understand:

Phonotactics, phoneme, [ ] vs. / /, minimal pair, phonological rule, assimilation, dissimilation, insertion, deletion,

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.
- abstracts from the physical data provided by phonetics.

2 Phonotactics

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

For example, certain languages allow only do not allow consonant clusters (CV syllables; this is a universal feature, but some languages are more strict than others). Interesting thing happens with borrowings from other languages:

Japaneese:

besuboru	– *baseball*	*sutoraiku*	– *strike*
gorufurendu	– *girlfriend*	*arubaito*	– *job* (German *Arbeit*)

Setswana (Botswana):

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

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

turoko	– *truck*	*puruvhu*	– *proof*
furusitopi	– *full stop*	*bhirifi*	– *brief*
sitirecha	– *strecher*	*giramu*	– *gram*
hendibhegi	– *handbag*	*kirimu*	– *cream*
kanduro	– *candle*	*bhirifi*	– *breaf*
chitofu	– *stove*		

Other examples:

- Word initial stress – Czech, Hungarian, Finish, English (for most words)
- Word final obstruents (stops, fricatives, affricates) are voiceless – Czech, Polish, Russian, German, Dutch and many other languages.

3 Phonemes

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

(1) a. English: *pit* [pʰɪt] vs. *spit* [spɪt]
b. Hindi: [pʰuːl] (fruit) vs. [puːl] (moment)

- English speakers consider [p] and the [pʰ] 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 [pʰ] are called variants (allophones) of the same **phoneme** /p/.

  In Hindi, [p] and [pʰ] are two distinct phonemes – /p/ and /pʰ/

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 [pʰ] 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. [pʰ] word initially, [p] otherwise); or we can say the choice is free

(2) a. Czech: *sílí* [siːliː] 'gets stronger' vs. *šílí* [ʃiːliː] 'is mad'
b. English: *see* [si] vs. *she* [ʃi]
c. Japanese: *saru* [saru] (monkey), *shiru* [širu] (to know)

- In Czech and English, [s] and [ʃ] are not allophones, because there are words that are distinguished just by these two sounds.
- In Japanese, [s] and [ʃ] are allophones, because there are no words distinguished just by these two sounds. The context determines which one is used. Before any vowel except [i], only [s] can occur; [ʃ] occurs in all other contexts. Thus in [-aru] we must choose [s] (*saru* 'monkey'), but in [-iru] we must choose [ʃ] (*shiru* 'to know').

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

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

(3)

	top	stop	little	kitten
phonology:	/tap/	/stap/	/lɪtl/	/kɪtn/
phonetics:	[t^hap]	[stap]	[lɪɾtl]	[kɪʔn]

The best way how to find whether two sounds are two distinct phonemes or just variants of a single phoneme, is to try to find so called **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* [dʒɪn]
[p] vs. [p^h]: There is no such a pair

4 Phonological Rules

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

(4) a. /pɪt/ → [p^hɪt]
b. /spɪt/ → [spɪt]

So we can say:

(5) a. /p/ → [p^h] 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/ → [t^h] at the beginning of the word
b. /k/ → [k^h] 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)

Languages have many rules like that. Some of them all the 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, ɟ, g, ð, z, ʒ, n, m, ...]),
- rounded vowels ([u, ʊ, o, ɔ]),
- nasals ([m, n, ŋ, ɲ]),
- sibilants (hissy sounds [s, z, ʃ, ʒ, tʃ, dʒ],
- etc.

In Czech or German, all word-final obstruents become voiceless:

(9)	a.	/hund/	→ [hunt]	*Hund*	(dog)
	b.	/hunde/	→ [hunde]	*Hunde*	(dogs)
	c.	/tag/	→ [tak]	*Tag*	(day)
	d.	/tage/	→ [tage]	*Tage*	(days)

The rule:

(10)

In some Spanish dialects, voiced stops change to fricatives if surrounded by vowels:

(11)	a.	/la beya dama/	→ [la βɛya ðama]	*la bella dama*
	b.	/la dama es beya/	→ [la ðama es bɛya]	*la dama es bella*
	c.	/la baka/	→ [la βaka]	*la vaca*
	d.	/las bakas/	→ [las bakas]	*las vacas*
	e.	/el dwɛño/	→ [el dwɛño]	*el dueño*
	f.	/el buřo/	→ [el buřo]	*el burro*

The rule:

(12)

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.
  - voicing assimilation: *kdo* [gdɔ] 'who', *vše* [fʃɛ] 'all' – a consonant must match the following consonant in voicing.
  - place assimilation:
    comfort [ɱf], *tramvaj* [ɱv] – /m/ can assimilate to /f/ → [ɱ] (bilabial → labiodental)
    input [mp], *bonbon* [mb] 'candy'
  - *bit* [ɪ] vs. *bin* [ĩ] – /ɪ/ assimilates to the following /n/ (nasal) → [ĩ]
  - *because you* [bɪkɔʒju]– /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 Czech/English as adjectives ending in *-al* or *-ar*.
    -al: *annecdot-al*, *annu-al*; *natur-ální*, *manu-ální*
    -ar: *angul-ar*, *annul-ar*; *mol-ární*, *plan-ární* (**plan-ální*)
    Here the change is even reflected in spelling.
- **Insertion** – a new sound is inserted.
  - *prince* /prɪns/ → [pʰrɪn(t)s]: [t] is sometimes inserted
  - *hamster* /hæmstr/ → [hæm(p)str]: [p] is sometimes inserted

  Reason: Difference of timing of various articulators. For example, in *prince* the velum is already positioned for pronouncing [s], but the tongue is in in place for [n], and [t] results.
- **Deletion** – a phoneme is not pronounced in certain environments
  - *hřebík* [ɦr̝ɛbiːk] → [r̝ɛbiːk] 'nail' (optional)
  - *pojď* [pɔjc] → [pɔc] 'come' (optional)
  - *okay* [okey] → [ʔkey] (optional)

  Reason: easier and faster to say
- **Metathesis** – two sound (usually adjacent) switch their place.
  - *vel+ryba* 'whale' (lit: big fish) [vɛlrɪba], sometimes [vɛrlɪba]
  - obligatory in Leti: /ukar + ppalu/ → [ukrapalu] 'index finger', /morut + kdieli/ → [mortukdjeli] 'very curly hair'

Rules may be **obligatory** (all speakers do it; e.g., final devoicing in Czech or nasalization of vowels in Czech/English) or **optional** (sometimes or some speaker do it; e.g., insertions/deletions above)