

Linguistics 203

Phonology

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Key Words / Concepts

- Phonology vs. phonetics
- Phoneme vs. allophone
- Distribution types:
 - contrastive / complimentary / free variation
- Distinctive feature
- Minimal Pair

Phonetics vs. Phonology

- Phonetics: the study of speech sounds
- Phonology: the study of the sound systems of languages
(sound system = inventory of sounds + rules)

Phonetics vs. Phonology

- Phonetics says:

“The /k/ in *call* [k^hal] and in *key* [k^hi] are phonetically distinct. In *key*, the /k/ is produced slightly further forward in the mouth than in *call*. We can represent this with a diacritic: [k̟^hi].”

- Phonology says:

“Who cares? To a native speaker, they’re the same sound.”

Phonetics vs. Phonology

- Here is an analogy involving letters:

A, A, a, a, ~~A~~, a, A, a, a, A, a, A, a, *A*, *a*, **A**, **a**, *A*

- To phonetics, these are all slightly different, as their forms are not identical.
- To phonology, these are all the same, since, psychologically, they all represent the letter <a>.

(Disclaimer: phonetics and phonology aren't concerned with letters at all, only with sounds. This is just an analogy.)

Phonology

- Phonology is largely concerned with the *contrastive* sounds of a language.
- Using the letter analogy again:
 - and <c> are contrastive, because *bat* and *cat* are minimally different and have different meanings.
 - <a> and <A> are not contrastive, because *ant* and *Ant* are minimally different but have the same meaning.

Minimal Pairs

- To determine if two sounds are contrastive, we look for minimal pairs.
- A *minimal pair* is two words...
 1. with the same number of sound segments, and
 2. which differ in one segment only, and
 3. which have different meanings

E.g. *bean* [bin] vs. *mean* [min], *mud* [mʌd] vs. *thud* [θʌd]

Thus, [b] and [m] are contrastive; so are [m] and [θ].
- Contrastive sounds belong to different *phonemes*.

Minimal Pairs

- Why is *bumping* *[bʌmpɪŋ] vs. *bumming* [bʌmɪŋ] *not* a minimal pair?

Contrastive Sounds

- Are [t] and [d] contrastive in English?
- Do they belong to the same phoneme?

- Are [t] and [t^h] contrastive in English?
- Do they belong to the same phoneme?

Contrastive Sounds

- Different languages have different contrasts.
- In Korean, [t] and [d] are not contrastive; i.e. they belong to the same phoneme
 - [d] appears between vowels, or after a liquid or nasal
 - [t] appears elsewhere

Contrastive Sounds

- On the other hand, in Korean, [t^h] and [t] belong to different phonemes.
 - [ta] ‘all’ vs. [t^ha] ‘other’, ‘Ride!’
- In English, ‘aspiration’ is not a *distinctive feature*, but it is in Korean.
 - Distinctive feature: a feature (e.g. [aspiration], [nasal], [round]) that, when changed, can create minimal pairs in a given language.

Distinctive Features

- What are some *distinctive features* in English?
- What are some *distinctive features* in French or German which were not distinctive in English?

Distinctive Features

- Nasal Vowels
 - In English, vowels before nasal consonants are nasalized
 - [mãm] ‘mom’
 - [bænd̃] ‘band’
 - [sĩŋ̃] ‘sing’
 - Vowels *not* before nasal consonants are *not* nasalized
- Are nasal vowels and non-nasal vowels contrastive in English?
- Do they belong to the same or different phonemes?

Distinctive Features

- Nasal Vowels

- In French, however, nasal vowels are contrastive with non-nasal vowels.

sound	FR spelling	EN translation
– [ba]	‘bas’	‘low’
– [bã]	‘banc’	‘bench’
– [bo]	‘beau’	‘handsome’
– [bõ]	‘bon’	‘good’

- Thus, in French, the sounds [a] and [ã], and [o] and [õ] belong to different phonemes.
- The feature [nasal] is *distinctive* for French vowels, but not for English vowels.

Phonology - Basics

- A *phoneme* can have several *allophones*.
- *Allophones* of a single phoneme are not contrastive with each other.
- *Allophones* are in *complementary distribution* with each other (or sometimes, in *free variation*)
- Allophone analogy:
 - {a, A, a, **A**, a, a, *A*} are allographs of the grapheme <a>

Complementary Distribution

- In English, [p] and [p^h] are allophones of the same phoneme. They are in complementary distribution with each other.
- Why?

Phonology - Basics

- Are [n] and [m] allophones of the same phoneme in English?
- Are they contrastive or in complementary distribution with each other?

Free Variation

- Sometimes, two sounds can be freely used in the same position without changing the meaning.

[k^hrɪb̚] / [k^hrɪb]

- In English, word-final [b] is in *free variation* with [b̚]
 - Note: this is true only *word-finally* in English

Free Variation

- What type of distribution do [s] and [z] have in Finnish?

[ku:zi]	'six'	ku:si	'six'
[li:za]	'Lisa'	li:sa	'Lisa'

- What type of distribution do [s] and [z] in English?

Solving a Phonology Problem

- First, determine the distribution.
 1. Are there minimal pairs for those sounds?

Yes? The sounds are contrastive and they belong to (= are allophones of) different phonemes. You are done!

No? Go to 2.
 2. Are they in complementary distribution?

Yes? They are allophones of one phoneme. Go to next slide.

No? They are in free variation. You are done!

Solving a Phonology Problem

- If sounds are in complementary distribution, you must find distribution of each allophone.
 1. Make a chart of the environments for each allophone (exclude duplicates).
 2. Look for patterns.
 3. Choose which one will represent the phoneme.
 4. Write rules showing the distribution.

Solving a Phonology Problem – Complementary Distribution

- [s] and [ʃ] in Korean

Data

son
som
jihap
jilsu
sosəl
sək
isa
sal
jipsam
jinho
majita
ofip

Step 1: Make a chart

s	ʃ
#_o	#_i
#_o	#_i
l_u	#_i
#_o	#_i
o_ə	a_i
#_ε	o_i
i_a	
#_a	
p_a	

Simplify →

s	ʃ
#_o	#_i
l_u	a_i
o_ə	o_i
#_ε	
i_a	
#_a	
p_a	

Complementary distribution and rules

- [s] and [ʃ] in Korean

Data

son
som
ʃihap
ʃilsu
sosəl
sək
isa
sal
ʃipsam
ʃinho
majita
ofip

Step 2: Look for patterns

s	ʃ
#_o	#_i
l_u	a_i
o_ə	o_i
#_ε	↑
i_a	
#_a	
p_a	

↑

Hints:

1. Start with C, V, #
2. Look for patterns in voicing on consonants
3. Look for patterns in the vowels
4. Look at place and manner of articulation of consonants.

Complementary distribution and rules

- [s] and [ʃ] in Korean

Data

son

som

ʃihap

ʃilsu

sosəl

sək

isa

sal

ʃipsam

ʃinho

majita

ofip

Step 2: Look for patterns

s	ʃ
#_o	#_i
l_u	a_i
o_ə	o_i
#_ε	
i_a	
#_a	
p_a	

[ʃ] appears in front of [i]

[s] does not

Complementary distribution and rules

- [s] and [ʃ] in Korean

Data

son
som
jihap
jilsu
sosəl
sək
isa
sal
jipsam
jinho
majita
ofip

Step 3: Determine what the phoneme is

s	ʃ
#_o	#_i
l_u	a_i
o_ə	o_i
#_ε	
i_a	
#_a	
p_a	

Which sound should be the phoneme?

/s/ occurs in more distinct environments, so it is our phoneme.

[s] and [ʃ] are *both* allophones of /s/

Complementary distribution and rules

- [s] and [ʃ] in Korean

Data

son
som
ʃihap
ʃilsu
sosəl
sək
isa
sal
ʃipsam
ʃinho
majita
ofip

Step 3: Write rules.

s	ʃ
#_o	#_i
l_u	a_i
o_ə	o_i
#_ε	
i_a	
#_a	
p_a	

1. Start with the 'opposite' sound.

Rule (English): change /s/ to [ʃ] in front of [i].

i.e. $/s/ \rightarrow [ʃ] / _i$

2. Do the 'same' sound.

$/s/ \rightarrow [s] / \text{elsewhere}$