

Day 7: Phonology

Ling L303/L503: Introduction to Linguistic Analysis

Jonathan North Washington

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1 *Phonological Rules*

2 *Phonology Problems*

Phonological Rules

Phonological Rules

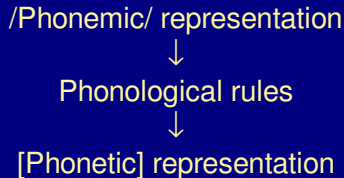
Definition (Phonological Rules)

Phonological rules are responsible for the mapping between the **phonemic** and **phonetic** (=allophonic) levels.

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 - 2 result of the rule
 - 3 environment where the rule applies

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- $A \rightarrow B / C$

Phonological Rules

Phonological rules

- Account for predictable properties of pronunciation
- Have 3 parts:
 - 1 sound(s) that undergo the rule
 - 2 result of the rule
 - 3 environment where the rule applies
- $A \rightarrow B / C$
- “A becomes B in the environment C”

Phonology Problems

How to solve a phonology problem

Some tests to solve phonology problems:

Phonology Problems

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- Minimal pairs: **?? distribution**

Phonology Problems

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- Predictability: **?? distribution**

Phonology Problems

How to solve a phonology problem

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- Predictability: **complementary distribution**
(allophones of ?? phoneme)

Phonology Problems

How to solve a phonology problem

Some tests to solve phonology problems:

- Minimal pairs: **contrastive distribution**
(allophones of different phonemes)
- Predictability: **complementary distribution**
(allophones of the same phoneme)

Phonology problems

Example

What are the high vowel phonemes of Mokilese?

Phonology problems

Example

What are the high vowel phonemes of Mokilese?

Example (Mokilese (#25, p. 140))

[pɪsɪn]	[uduk]
[dupɔkda]	[kaskas]
[pɔko]	[poki]
[kɪsa]	[pil]
[sɔpwo]	[apid]
[kamwɔkɪti]	[ludʒuk]

Phonology problems

Example

What are the high vowel phonemes of Mokilese?

Example (Mokilese (#25, p. 140))

[pɪsɔn]	[uduk]	i̇	u̇	i	u
[dupɔkda]	[kaskas]	p_s	p_k	_#	d_p
[pɔko]	[poki]	k_s	s_p	p_l	#_
[kɪsa]	[pil]	k_t		p_d	d_k
[sɔpwo]	[apid]				_#
[kamwɔkɪti]	[ludʒuk]				l_d
					_k

Phonology problems

Step 1

i	u	i	u
p_s	p_k	_#	d_p
k_s	s_p	p_l	#_
k_t		p_d	d_k
			_#
			l_d
			ʒ_k

Phonology problems

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Phonology problems

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Step 1: Look at environments to find natural classes

Phonology problems

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		_#	
		l_d	
		ʒ_k	

Step 1: Look at environments to find natural classes

- [i] occurs...

Phonology problems

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Step 1: Look at environments to find natural classes

- [i] occurs...
 - between voiceless consonants

Phonology problems

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- [i] occurs...
 - between voiceless consonants
- [u] occurs...

Phonology problems

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- [i] occurs...
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- [u] occurs...
 - between voiceless consonants
- [i], [u] occur...

Phonology problems

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Step 1: Look at environments to find natural classes

- [i] occurs...
 - between voiceless consonants
- [u] occurs...
 - between voiceless consonants
- [i], [u] occur...
 - No natural class can be used to define where [i], [u] occur

Phonology Problems

Step 2

Step 2:

Phonology Problems

Step 2

Step 2: Look to see if environments overlap

Phonology Problems

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- [i] does not occur where [i̯] does, and vice versa

Phonology Problems

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- [i] does not occur where [i̯] does, and vice versa
- [u] does not occur where [u̯] does, and vice versa

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THUS...

Phonology Problems

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- [i] does not occur where [i̯] does, and vice versa
- [u] does not occur where [u̯] does, and vice versa

THUS...

- [i̯] and [i] are in complementary distribution

Phonology Problems

Step 2

Step 2: Look to see if environments overlap

- [i] does not occur where [i̯] does, and vice versa
- [u] does not occur where [u̯] does, and vice versa

THUS...

- [i̯] and [i] are in complementary distribution
- [u̯] and [u] are too

Phonology Problems

Step 3

Step 3:

Phonology Problems

Step 3

Step 3: State generalisations

Phonology Problems

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- “[i] and [u] are voiceless...

Phonology Problems

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- “[i] and [u] are voiceless...
...when they occur between voiceless consonants.”

Phonology Problems

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- “[i] and [u] are voiceless...
...when they occur between voiceless consonants.”
- “[i] and [u] are voiced...

Phonology Problems

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- “[i] and [u] are voiceless...
...when they occur between voiceless consonants.”
- “[i] and [u] are voiced...
...everywhere else.”

Phonology Problems

Step 3

Step 3: State generalisations

- “[i] and [u] are voiceless...
...when they occur between voiceless consonants.”
- “[i] and [u] are voiced...
...everywhere else.”
- Question: Is the Mokilese rule a voicing rule or a devoicing rule?

Phonology Problems

Step 4

Step 4:

Phonology Problems

Step 4

Step 4: Determine identity of the phonemes and their allophones

Phonology Problems

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- Basic:

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- Basic:
 - Assumed to be the phoneme that undergoes the rule

Phonology Problems

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I.e., Which is the basic and which is the restricted allophone(s)?

- Basic:
 - Assumed to be the phoneme that undergoes the rule
 - Occurs in wider, more complex set of environments

Phonology Problems

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- Restricted ('derived'):

Phonology Problems

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 - Predicted to be the outcome of the rule

Phonology Problems

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I.e., Which is the basic and which is the restricted allophone(s)?

- Basic:
 - Assumed to be the phoneme that undergoes the rule
 - Occurs in wider, more complex set of environments
- Restricted ('derived'):
 - Predicted to be the outcome of the rule
 - Occurs in simplest set of environments

Phonology Problems

Solution

Rule for Mokilese?

Phonology Problems

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- “/i/ and /u/ become [i̥] and [u̥] between voiceless consonants”

Phonology Problems

Solution

Rule for Mokilese?

- “/i/ and /u/ become [i̥] and [u̥] between voiceless consonants”
or...

Phonology Problems

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Rule for Mokilese?

- “/i/ and /u/ become [i̥] and [u̥] between voiceless consonants”
or...
- “High vowels become voiceless between voiceless consonants”

Phonology Problems

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Phonology Problems

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Rule for Mokilese?

- “/i/ and /u/ become [i̥] and [u̥] between voiceless consonants”
or...
- “High vowels become voiceless between voiceless consonants”
or...
- $V_{[+high]} \rightarrow [-voice] / C_{[-voice]} __ C_{[-voice]}$

Phonology Problems

Summary

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- ① List the phonetic environments
- ② State the environments in terms of natural classes
- ③ Are the environments **the same** or **non-overlapping**?
 - Same: Contrastive distribution (allophones of different phonemes) e.g., [i] vs. [u]
 - Non-overlapping: Complementary distribution (allophones of the same phoneme) e.g., [i̯] vs. [i]
- ④ Identify the basic vs. restricted allophone(s)