

LNGT0101

Introduction to Linguistics



Lecture #16
Nov 3rd, 2014

Announcements

- Comments on Prof. Cameron's talk on Language and gender.
- Midterm is now due at the beginning of Wed's class. Only hard copies will be accepted. Also take advantage of my Tuesday office hours if you have questions on the midterm.
- Any **quick** questions on the midterm?

2

Announcements

- Screening of *The Writing Code* on Wed from 7 to 8pm. Room: Library 230.
- Presentation of Myth 20 on Wed: "Everyone has an accent except me." Volunteers?

3

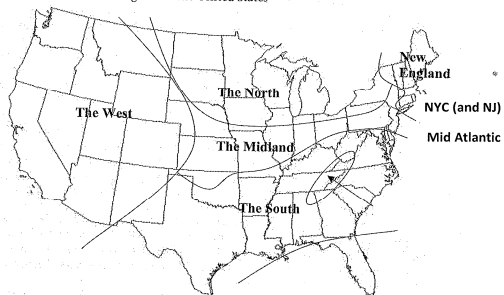
How do you say it in your dialect?

- http://www.washingtonpost.com/posttv/national/how-do-you-pronounce-water/2014/07/09/3ef471c2-0760-11e4-9ae6-0519a2bd5dfa_video.html
- For Wednesday's class, take the Dialect Quiz on the NYT website:
- <http://www.nytimes.com/interactive/2013/12/20/sunday-review/dialect-quiz-map.html>

4

Next class please sit by your American English dialect area

(3) Approximate dialect regions of the United States



<https://www.youtube.com/watch?v=fGxIxOcS-tE>

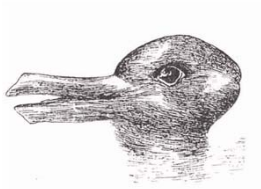
5

A visual puzzle

- http://www.magicmgmt.com/gary/oi_pac_tri/#

6

Another visual illusion (just for fun)



- http://www.youtube.com/watch?v=hPCoe-6RRks&feature=player_embedded#!

Visual puzzles (Nieder 2002)



Fig 2.4 Rectangles constructed by visual system – of Isomura and Imai, who can be trained to treat the two figures as members of an equivalence class in terms of orientation.



Fig 2.5 The bees do not treat the illusory rectangle above as the same as either of these two figures.

Images from Isac and Reiss's book "I-Language"

8

And your point is ... ?

- Something that we've been stating repeatedly, but now you should have seen enough evidence for it in language:

We need **abstraction**.

9

Linguistic puzzles and the need for abstraction

- Phonetically different sounds are perceived as similar: [t] in *star*, [t^h] in *tar*, [r] in *butter*, and [t^ɹ] in *bat*.
- Phonetically identical sounds are perceived as different: [r] in *waiting*, and [r] in *wading*.
- The morpheme of plural '-s' in English is pronounced as [s], [z], or [əz], depending on the values of the voicing and sibilant features of the noun's final sound.

10

Linguistic puzzles and the need for abstraction

- Same sentences can have multiple interpretations (ambiguity).
- Different structures have the same interpretation (active and passive sentences).
- Similar structures have different interpretations (*John is easy vs. eager to please*).

11

Linguistic puzzles and the need for abstraction

- Constituency. D-structure. Movement. Islands.
- Wh-movement can be infinitely long, EXCEPT out of islands.
- Word orders in English/Edo vs. Japanese/Lakhota look nothing alike on the surface, but are derived from the same mechanisms once we look beneath the surface.
- And others.

12

Now, back to some unfinished business with phonology

- Remember that the first goal of linguistic theory is to answer the following question:
“What is it that we know when we know a language?”
- The study of phonology is another step towards this goal: It reveals to us the kind of subconscious knowledge that native speakers have about the sound system of their language.

13

What do you know when you know that English has a /t/ sound?

- Native speakers of English, like most of you are, know that English has one /t/ sound in the words *team*, *steam*, *rat*, and *writer*, but at the same time you pronounce each /t/ in a different way: as [t^h], [t], [t^ɹ], or [ɾ], depending on the phonological context.

14

Phonemes vs. allophones

- **Phonemes** are meaning-distinguishing sounds. They are abstract entities. They are unpredictable. They stand in **contrastive** distribution.
- **Allophones** are phonetic variants of the same phoneme. They are the physical sounds we say and hear. They are predictable. They stand in **complementary** distribution.
- Phonemes become allophones via phonological processes (e.g., aspiration, devoicing, nasalization, etc.). These processes are represented by **phonological rules**.

15

Two main questions in phonological analysis

- **First**, how do we know if two (or more) sounds in a particular language are phonemes or allophones, given a set of data from that language? For this, we follow the **step-by-step** procedure.
- **Second**, if the two sounds turn out to be allophones of the same phoneme, how do we express this fact? For this, we write a **phonological rule**.

16

Steps for solving phonology problems

- Given two sounds, X and Y, and a set of data in Language L, the task is to determine if X and Y are
 - (a) separate phonemes in L, or
 - (b) allophones of the same phoneme in L.
- To do that, we proceed methodically.

Minimal pairs?

- **Step 1:**
See if there are any **minimal pairs** in the data where the two sounds in question are in **contrastive** distribution. If yes, then the two sounds are phonemes. If not, then proceed to step 2.

Overlapping or complementary?

- **Step 2:**
Find out if the two sounds are in overlapping or in complementary distribution.
 - If **overlapping**, then the two sounds are most likely two different phonemes (but we cannot be sure).
 - If **complementary**, then the sounds are allophones of the same phoneme, in which case we state the phonological environments in which each allophone occurs and then move to step 3.

Which is underlying, and which is derived?

- **Step 3:**
Once you determine the environments in which each sound occurs, it is time to determine which one is the **underlying** form and which one is **derived**. In most cases, the sound that appears in more phonetic contexts can be taken to represent the underlying phoneme.
 - For example, in English oral vowels occur initially, finally, as well as before nonnasal consonants. Nasal vowels, by contrast, occur only before nasal consonants.

Write a rule!

- **Step 4:**
Now, you are in a position to write a phonological rule that shows the process whereby the allophones are **derived** from the **underlying** phoneme.
- **Note:** For this class, we'll be content with the informal representation of phonological rules. If you want to know more about the 'formal' rules, please read the slides at the end of these lecture slides.

So, which form is derived from the other?

- The rule of thumb is this: The form that occurs in a larger number of phonetic contexts is most likely to be the underlying form.
- The form that is restricted in its occurrence to particular contexts is most likely to be a derived form. The underlying form, thus, is typically referred to as the **elsewhere** form.
- **Note:** A 'larger number of contexts' does not mean 'a larger number of words in the data.'

22

Some phonology problems

23

Some phonology problems: Finnish

- Consider the following Finnish words:
 1. [kudot] "failures"
 2. [katot] "roofs"
 3. [kate] "cover"
 4. [kade] "envious"
 5. [madon] "of a worm"
 6. [ratas] "wheel"
 7. [maton] "of a rug"
 8. [radon] "of a track"
- Question: Are [t] and [d] two different phonemes or two allophones of the same phoneme in Finnish?

Some phonology problems: Tagalog

- Now, consider these Tagalog words:

1. [datiŋ] "to arrive"	6. [daraʔiŋ] "will complain"
2. [dami] "amount"	7. [marumi] "dirty"
3. [dumi] "dirt"	8. [marami] "dirty"
4. [daratiŋ] "will arrive"	9. [daʔiŋ] "to complain"
5. [mandurukot] "pickpocket"	10. [mandukoʔ] "to go pickpocketing"

- Question: Are [d] and [r] phonemes or allophones in Tagalog?

Sindhi

- Are [p], [p^h], and [b] separate phonemes or different allophones of the same phoneme in Sindhi? State your evidence.

a. [pənu]	'leaf'	g. [təru]	'bottom'
b. [vəɖʒu]	'opportunity'	h. [kʰəto]	'sour'
c. [feki]	'suspicious'	i. [bəɖʒu]	'run'
d. [gədo]	'dull'	j. [bənu]	'forest'
e. [daru]	'door'	k. [bətʃu]	'be safe'
f. [pʰənu]	'hood of snake'	l. [ɖʒəɖʒu]	'judge'

26

Standard Italian

- Are [n] and [ɲ] separate phonemes or different allophones of the same phoneme in Standard Italian? State your evidence.

a. [tinta]	'dye'	g. [tiŋgo]	'I dye'
b. [tenda]	'tent'	h. [teŋgo]	'I keep'
c. [dantsa]	'dance'	i. [fuŋgo]	'mushroom'
d. [nero]	'black'	j. [bjaŋka]	'white'
e. [dʒente]	'people'	k. [aŋke]	'also'
f. [sapone]	'soap'	l. [faŋgo]	'mud'

27

Standard Spanish

- Are [d] and [ð] separate phonemes or different allophones of the same phoneme in Standard Spanish? State your evidence.

a. [drama]	'drama'	g. [komiða]	'food'
b. [dolor]	'pain'	h. [anda]	'scram'
c. [dime]	'tell me'	i. [sweldo]	'salary'
d. [kaða]	'each'	j. [durar]	'to last'
e. [lado]	'side'	k. [toldo]	'curtain'
f. [odio]	'hatred'	l. [falda]	'skirt'

28

Russian

- Are [a] and [ɑ] separate phonemes or different allophones of the same phoneme in Russian? State your evidence.

a. [atəm]	'atom'	f. [upaʃ]	'he fell'
b. [dva]	'two'	g. [daʃ]	'he gave'
c. [dar]	'gift'	h. [pa:ʃkə]	'stick'
d. [masʲ]	'ointment'	i. [ukrəʃə]	'she stole'
e. [mʲatə]	'mint'	j. [brəʃ]	'he took'

29

Mokilese

- Are voiced [i, u] and voiceless [i̥, u̥] separate phonemes or different allophones of the same phoneme in Mokilese? State your evidence.

a. [pʃsan]	'full of leaves'	g. [uduk]	'flesh'
b. [dupʃkda]	'bought'	h. [kaskas]	'to throw'
c. [pʃko]	'basket'	i. [poki]	'to strike something'
d. [kʃsa]	'we two'	j. [pil]	'water'
e. [ʃupwo]	'firewood'	k. [apid]	'outrigger support'
f. [kamwəkʃti]	'to move'	l. [ʃudʒuk]	'to tackle'

30

Mokilese

- Are voiced [i, u] and voiceless [i̥, u̥] separate phonemes or different allophones of the same phoneme in Mokilese? State your evidence.

a. [pʃsan]	'full of leaves'	g. [uduk]	'flesh'
b. [dupɥkda]	'bought'	h. [kaskas]	'to throw'
c. [pɥko]	'basket'	i. [pokɪ]	'to strike something'
d. [kʃsa]	'we two'	j. [pɪ]	'water'
e. [sɥpwo]	'firewood'	k. [apid]	'outrigger support'
f. [kamwəkɪtɪ]	'to move'	l. [ludʒuk]	'to tackle'

31

The formalization procedure: Representing phonological knowledge in formal rules

32

Phonological rules

- Informally speaking, a phonological rule takes an **underlying** form as **input**, **operates** on it, and gives a **derived** form as **output**.
- The operation of the rule, however, is subject to a main restriction: it has to occur in a certain phonological **environment**.

33

Phonological rule notation

- Abstractly, we can represent this in the following notation: $X \rightarrow Y / _ Z$
- **Basic definitions:**
 - the ' \rightarrow ' means 'changes to';
 - the slash '/' means 'in the environment of'; and
 - the ' $_$ ' positions the input in relation to other elements in the phonological environment (e.g., before or after).
- What this rule simply says is "An input X changes to Y when it occurs before Z."

34

Phonological rule notation

- Suppose instead that we want to say that X changes to Y *after* (rather than *before*) Z. How do we do that in rule notation?
- Well, a simple change will get us the required result:

$$X \rightarrow Y / Z _$$

35

An example: Vowel nasalization in English vs. Scots Gaelic

- English vowel nasalization:
 - "In English, vowels become nasalized before a nasal consonant."
- Formal rule: $V \rightarrow [\text{nasal}] / _ [\text{nasal}]$
- But now, how about vowel nasalization in Scots Gaelic, where vowels become nasalized after nasal consonants. How do we express that in rule notation?

$$V \rightarrow [\text{nasal}] / [\text{nasal}] _$$

36

Phonological rule notation

- Suppose further we want to place a certain restriction on the occurrence of the input sound. For example, that it has to occur “syllable-initially” or “at a word boundary.”
- Again, we can come up with two simple notations to indicate either environment.

37

Phonological rule notation

- By convention, we will use “\$” to indicate a syllable boundary, and “#” to indicate a word boundary.
- Now, read the following abstract rules.
 $x \rightarrow y / \$ _$
 $x \rightarrow y / _ \$$
 $x \rightarrow y / _ \#$
- Can you figure out what each means?

38

Aspiration

- Let’s consider the rule for aspiration of voiceless stops in English:
“Voiceless stops become aspirated in English when they occur syllable-initially.”
- How do we represent that in formal rule notation in phonology?
 $[\text{voiceless stop}] \rightarrow [\text{aspirated}] / \$ _$
- Now, in which of these words does aspiration take place?
tone, stone, maintain, intimidate

39

Challenging the aspiration rule

- But now, consider this:
Usain Bolt runs [**fæs.tɔɪ**] than any other human being.
- Why no aspiration here?

40

/l/-devoicing

- Consider now the rule for /l/ devoicing in English. Informally put, the rule says:
“/l/ gets devoiced when following a syllable-initial voiceless stop.”
- How do we represent this in phonological rule notation?
 $/l/ \rightarrow [l] / \$ [\text{voiceless stop}] _$
- Now, in which of these words does /l/-devoicing take place?
place, pile, claim, booklet, meatloaf

41

Vowel length in English

- Remember the rule for vowel length in English?
“Vowels are lengthened before voiced consonants.”
bad [bæ:d] bat [bæt]
leave [li:v] leaf [lif]
- How would the rule look like in formal notation?

42

Vowel length in English

- But now consider these cases:
obey [oubeɪ]
redo [ˌɪdu]
- Why is there no vowel lengthening here?

43

Revisiting vowel nasalization

- There is no vowel nasalization in the pronunciation of the word *phonetics* [fəˈnetɪks], contrary to our earlier rule:
 $V \rightarrow [\text{nasal}] / ___ [\text{nasal}]$
- Can you now figure out why?

44

Word-final devoicing

- Suppose a language has the following rule:
“A voiced stop gets devoiced if it occurs at the end of a word.”
- How do we represent this in phonological rule notation?
 $[\text{voiced stop}] \rightarrow [\text{voiceless}] / ___ \#$
- German *Bad* ‘bath’ is pronounced [ba:t].

45

Phonological rule notation

- In some cases an element in the environment may be **optional**. How do we represent that in the notation of our rules?
- **Parentheses** will do the trick. Consider this rule. What does it say?
 $X \rightarrow Y / ___ (Z) \$$

46

Vowel nasalization ‘at a distance’

- Suppose a language has a rule like this one:
“Vowels become nasalized before nasal consonants in coda position, even if there is another consonant intervening.”
- So, in such a language, the following holds:
lam [lām] latm [lātm]
- How do we represent this in phonological rule notation?
 $V \rightarrow [\text{nasal}] / ___ (C) [\text{nasal}] \$$

47

Phonological rule notation

- Sometimes we might have more than one context for the application of a rule. How do we indicate that using our rule notation?
- **Braces** come to the rescue, as in this rule:
 $X \rightarrow Y / ___ \left\{ \begin{array}{l} Z \\ \# \end{array} \right\}$
- The above rule simply means that “X changes to Y **either** before Z **or** at word boundary.”

48

Deletion

- How about deletion rules? For these, we use the symbol \emptyset in the output of the rule (i.e., after the arrow). What does the following rule say?

$$C \rightarrow \emptyset / _ \#$$

49

Deletion

- Suppose a language has the following rule:
“A consonant deletes if it occurs at the end of a word, unless the next word starts with a vowel.”
- How do we represent this in phonological rule notation?
$$C \rightarrow \emptyset / _ \# C$$
- French: *les garçons* versus *les amis*.

50

Deletion in multiple contexts

- Suppose a language has the following rule:
- “Do not pronounce /r/ if it is followed by a consonant in coda position or if it is word-final.”
- How do we represent this in phonological rule notation?

51

Deletion in multiple contexts

$$/r/ \rightarrow \emptyset / _ \left\{ \begin{array}{l} C \$ \\ \# \end{array} \right\}$$

- RP: *farm* and *dear*

52

Epenthesis

- The \emptyset comes in handy for phonological rules that insert sounds as well. The key difference here is that the \emptyset will be in the input to the rule.
- For example, in some English dialects, consonant clusters of [l] and another consonant are not allowed in syllable-final position. Speakers of these dialects, therefore insert a [ə] to fix the syllable, e.g., *milk* is pronounced [milək].
- In rule notation, this would be represented as:
$$\emptyset \rightarrow [ə] / [l] _ C \$$$
- Predict how speakers of these dialects say *elf* and *milky*?

53

Next class agenda

- Presentation and discussion of Myth 20.
- Introducing sociolinguistics and dialectal variation. Read Chapter 7, pp. 279-287.
- Take this Dialect Quiz on the NYT website:
- <http://www.nytimes.com/interactive/2013/12/20/sunday-review/dialect-quiz-map.html>

54