LNGT0101
Introduction to Linguistics

Lecture #9
Oct 8th, 2012

Announcements

- Language code names for online score sheet.
- Average score on HW1 is 75/80. Median is 78.
- Any questions on HW2 or otherwise?

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Today's agenda: Phonology

- Introducing phonemes and allophones.
- How to figure out if two or more sounds are phonemes or allophones in a particular language. (An algorithm of solving phonology problems).
- Doing some phonology problems (problem-solving skills)

Phonology

- While phonetics studies how speech sounds are articulated, what their physical properties are, and how they are perceived, phonology studies the organization of speech sounds in a particular language.
- As it turns out, while two or more languages may have the same sounds, no two languages organize their sound inventories in the same way. Let's look at an example.

[s] and [ʃ] in Japanese vs. English

- In both English and Japanese we hear the sounds [s] and [ʃ]:

  Japanese: [ʃimasu] "do"
  English: [slæʃ] "slash"

[s] and [ʃ] in Japanese vs. English

- In English, however, the occurrence of each sound is **unpredictable**.
- Given [_oɹ], which sound do you think should occur in the blank?
- Either one can, giving us two words with two different meanings:

  [ʃoɹ] "shore" vs. [soɹ] "sore"

[s] and [ʃ] in Japanese vs. English

- By contrast, in Japanese, we do not find pairs where [s] and [ʃ] create a difference in meaning.
- In Japanese, if we have [_imasu], and a choice of [s] and [ʃ] , we predict that only [ʃ] may occur in the blank: [ʃimasu] "do".
- Similarly, if we have [_an], we predict that only [s] may occur in the blank: [san] "three"
- If we make the wrong choice in the blank, we get a nonsense word. Japanese cannot have [simasu] or [ʃan].

Phonology

- Phonology addresses questions related to the sound system of a given language. Basically:

1. Which sounds are predictable and which sounds are unpredictable in a given language?
2. What are the rules regulating the occurrence of predictable sounds?
3. How can we state speakers' knowledge of these rules in a 'formal' notation?

- We discuss the first two questions today and the third on Wednesday.

Phonological knowledge is subconscious

- Native speakers of a particular language typically treat certain sounds as being the same, even when they are phonetically different, e.g.,

  the [l] in *lay* and *play*

  the [t] in *top* and *stop*
- But other sounds are considered different even when they sound the same:

  [ɹaɪɾəɹ] 'rider' and [ɹaɪɾəɹ] 'writer'

Phonemes vs. allophones

- Phonologists explain the difference by invoking a distinction between **phonemes** and **allophones**.
- A phoneme is a sound that distinguishes meaning in a language, whereas an allophone is a phonetic variant of a particular phoneme that does not affect meaning.

Minimal pairs

- Phonemes create words that differ in meaning. Hence, they are **contrastive**.
- But how do we know if two sounds are contrastive in a particular language?
- Answer: **Minimal pairs**.
- A minimal pair is two words with different meanings that are identical except for one sound that occurs in the same place in each word, e.g.,

  seed [sid] and *seat* [sit]

Phonemes or allophones?

- So, bearing this in mind, let's consider more examples from English.
- Based on the minimal pair *light* [laɪt] and *right* [ɹaɪt], are the [l] and [r] phonemes or allophones in English?
- Based on the minimal pair *pan* [pæ̃n] and *ban* [bæ̃n], are the [p] and [b] phonemes or allophones in English?

Phonemes or allophones?

- How about these further minimal pairs?

seat [sit] and *sit* [sɪt]

fool [ful] and *full* [fʊl]

sip [sɪp] and *zip* [zɪp]

leaf [lif] and *leave* [liv]

Phonemes or allophones?

- How about these further minimal pairs?

seat [sit] and *sit* [sɪt] → [i] &[ɪ] are phonemes.

fool [ful] and *full* [fʊl] → [u] &[ʊ] are phonemes.

sip [sɪp] and *zip* [zɪp] → [s] &[z] are phonemes.

leaf [lif] and *leave* [liv] → [f] &[v] are phonemes.

Aspiration in English

- Now, let's consider the following (made-up) minimal pairs:
  a. *tar*: [t^haɹ] vs. *[taɹ]
  b. *star*: [staɹ] vs. *[st^haɹ]
- Now, here's the question: Are the two sounds [t^h] and [t] phonemes or allophones in English?
- Since [t^h] and [t] are **not contrastive** in English, they are two **allophones** of the same phoneme, which we might represent here as **/t/**.

(Notice the slash, rather than the square bracket, notation.)

Aspiration in Thai

- But now consider aspirated and unaspirated voiceless stops in Thai.

[paa] "forest"	[p^haa] "to split"
[tam] "to pound"	[t^ham] "to do"
[kat] "to bite"	[k^hat] "to interrupt"

- Are these sounds phonemic or allophonic in Thai?

Nasal vowels in English

- How about nasal vowels in English? Are they phonemes or allophones?
- First, let's try to find (or construct) a couple of minimal pairs:
  a. *ban* [bæ̃n] vs. *[bæn]
  b. *bat* [bæt] vs. *[bæ̃t]
- Is the contrast here phonemic or allophonic?

Nasal vowels in French and Akan

- Now, consider nasal vowels in French:

gars [ga] "lad"	*gant* [gã] "glove"

- Are they phonemes or allophones?
- How about Akan, a Ghanian language?

[ka] "bite"	[kã] "speak"
[tu] "pull"	[tũ] "den"
[pam] "sew"	[pãm] "confederate"

Distribution: contrastive vs. complementary

- From all these examples, you should have noticed that different allophones occur in different environments, that is, where one of them occurs, the other doesn't, and vice versa, which is not the case with phonemes.
- We say that allophones occur in **complementary distribution,** whereas phonemes occur in **contrastive distribution.** And this is the key way to distinguish between a phoneme and an allophone in a given language.

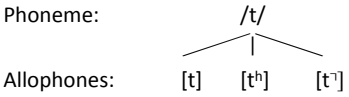
Sounds in 'free variation'

- Occasionally, two sounds in a language can be in free variation, that is, they may optionally occur in the same context without affecting meaning.
- For example, English stops may or may not have an audible release in final position.

  mat [mæt] or [mæt˺]
- The IPA symbol for 'no audible release' is ˺.
- Obviously, since sounds in free variation do not create a difference in meaning, they are _____.

Phonemes are abstract entities

- So, phonemes are meaning-distinguishing sounds, whereas allophones are phonetic variants of the same phoneme that occur in specific contexts.
- Notice that this means that phonemes are actually **abstract** entities in your head rather than actual sounds that come out of your mouth.



Phonemes are abstract entities

- The psychological existence of phonemes can be noticed in native speakers' slips of the tongue, e.g., *key chain* [ki tʃeɪn] may come out as [tʃi kejn], but never as *[ti kʃeɪn].
- This shows that the affricate [tʃ] is stored in the mind as a single unit, just as [k] is.

Steps for solving phonology problems

- Given two sounds and a set of data, the task is to determine if the two sounds are separate phonemes or allophones of the same phoneme in a language. To do that, we proceed methodically.

Minimal pairs?

- <u>Step 1</u>:

  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 environments can be taken to represent the underlying phoneme.

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.

Some phonology problems: Tagalog

- Now, consider these Tagalog words:

1. [datiŋ]	"to arrive"	6. [daɾaʔiŋ]	"will complain"
2. [dami]	"amount"	7. [maɾumi]	"dirty"
3. [dumi]	"dirt"	8. [maɾami]	"dirty"
4. [daɾatiŋ]	"will arrive"	9. [daʔiŋ]	"to complain"
5. [mandɯɾukot]	"pickpocket"	10. [mandukot]	"to go pickpocketing"

- Question: Are [d] and [ɾ] phonemes or allophones?

Sindhi

24. Sindhi

The following data are from Sindhi, an Indo-European language of the Indo-Aryan family, spoken in Pakistan and India. Examine the distribution of the phones [p], [pʰ], and [b]. Determine if the three are allophones of separate phonemes or allophones of the same phoneme. What is your evidence? Is the relationship among the sounds the same as in English? Why or why not?

a.	[pənu]	'leaf'	**g.**	[tərɯ]	'bottom'
b.	[vədʒu]	'opportunity'	**h.**	[kʰəto]	'sour'
c.	[ʃeki]	'suspicious'	**i.**	[bəd͡ʒu]	'run'
d.	[gədo]	'dull'	**j.**	[bənu]	'forest'
e.	[dəɾu]	'door'	**k.**	[bəʈu]	'be safe'
f.	[pʰənu]	'hood of snake'	**l.**	[d͡ʒəd͡ʒu]	'judge'

Standard Italian

25. Standard Italian

Consider the following data from Standard Italian, an Indo-European language of the Romance family, spoken in Italy. Answer the questions that follow.

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

i. Are there any minimal pairs? If so, what are they, and what can you conclude to be true of Italian from those minimal pairs?

ii. State the phonetic environments in which the sounds [n] and [ŋ] appear. Identify any natural classes of sounds that appear in the environments you've provided.

iii. Given what you know about the distribution of sounds and the environments you listed in (ii), are [n] and [ŋ] in complementary or contrastive distribution? Please explain your answer.

Standard Spanish

26. Standard Spanish

Standard Spanish is an Indo-European language of the Romance family. Examine the phones [d] and [ð]. Determine whether they are allophones of one phoneme or of separate phonemes. If they are allophones of one phoneme, identify the type of distribution. If they are in complementary distribution, state a rule that describes the distribution. If [d] and [ð] are allophones of separate phonemes, give minimal pairs that prove this.

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

Russian

27. Russian

Russian is an Indo-European language of the Slavic family, spoken in Russia. Determine from the following Russian data whether [a] and [ɑ] complement each other as allophones of the same phoneme or whether they are in contrast as allophones of separate phonemes. If they are allophones of separate phonemes, provide evidence for your claim. If they are in complementary distribution, pick one allophone as the basic sound, and give the conditioning phonetic contexts for its allophones. ([ɬ] represents a velarized [l], [sʲ] a palatalized alveolar fricative, and [mʲ] a palatalized voiced bilabial nasal.)

a.	[atəm]	'atom'	**f.**	[upaɬ]	'he fell'
b.	[dva]	'two'	**g.**	[daɬ]	'he gave'
c.	[dar]	'gift'	**h.**	[pɑːɬkə]	'stick'
d.	[masʲ]	'ointment'	**i.**	[ukrɑɬə]	'she stole'
e.	[mʲatə]	'mint'	**j.**	[brɑɬ]	'he took'

Tojolabal

32. Tojolabal

Tojolabal is a Mayan language of the Kanjobalan-Chujean family, spoken in Mexico. Determine whether plain [k] and glottalized [kʾ] are allophones of a single phoneme, in free variation, or in contrast. Support your answer with specific examples. (*Hint:* Don't forget that near-minimal pairs can be as convincing as minimal pairs.)

a.	[kisim]	'my beard'	**g.**	[sak]	'white'
b.	[tʾakʾa]	'chop it down'	**h.**	[kʾiʃin]	'warm'
c.	[koktit]	'our feet'	**i.**	[skutʃu]	'he is carrying it'
d.	[kʾak]	'flea'	**j.**	[kʾuːtes]	'to dress'
e.	[pʾakan]	'hanging'	**k.**	[snika]	'he stirred it'
f.	[kʾaʔem]	'sugar cane'	**l.**	[ʔakʾ]	'read'

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Mokilese

23. Mokilese

Mokilese is an Austronesian language of the Malayo-Polynesian family, spoken in Micronesia. Examine the distribution of the voiced and voiceless vowel pairs: [i, i̥] and [u, u̥] (voiceless vowels have a circle under the phonetic vowel symbol). For each pair, determine whether they are allophones of different phonemes or allophones of the same phoneme. Provide evidence for your answer. If they are allophones of one phoneme, state the contexts in which each sound occurs and decide which sound is the basic sound. Can any generalizations be made? (*Hint:* Refer to natural classes.)

a.	[pi̥san]	'full of leaves'	**g.**	[uduk]	'flesh'
b.	[dupu̥kda]	'bought'	**h.**	[kaskas]	'to throw'
c.	[pu̥ko]	'basket'	**i.**	[poki]	'to strike something'
d.	[ki̥sa]	'we two'	**j.**	[pil]	'water'
e.	[su̥pwo]	'firewood'	**k.**	[apid]	'outrigger support'
f.	[kamwɔki̥ti]	'to move'	**l.**	[ludʒuk]	'to tackle'

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Summary

- **Phonemes** are meaning-distinguishing sounds. They are unpredictable. They are abstract entities.
- **Allophones** are phonetic variants of the same phoneme. They are predictable by rule. They are the physical sounds we produce.
- Phonemes become allophones via phonological processes, which are represent formally as **phonological rules**. We discuss how to do this on Wednesday.

Next class agenda

- Phonological rules. Chapter 7, pp. 284-296.