Course title: Basic Phonetics and English phonology

Topic: Phonology: Allophonic variations

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PHONOL0GY

- Our past seven lessons have focused on phonetics.
- In this lesson, we shift our focus to phonology.
- Phonology differs from other parts of linguistics in that it is not immediately obvious why such a field should exist.
- We know that languages have words, and that words are made up of speech sounds –
- why couldn't we specify the string of speech sounds that every word is made up of, and let it go at that?
- It turns out that the real world of phonological systems is far more complicated:

- First, the sounds tend to vary with their context, mostly for phonetic reasons.
- Second, the **distribution** of the sounds is not arbitrary, but follows complex, rule-governed patterns.
- Third, phonology is interfaced with other components of the grammar:
- notably morphology and syntax,
- and there are various ways in which sound patterning reflects these components.

Distinctiveness and contrast

- Consider the /t/ sound of English
- It has no linguistic interpretation in and of itself.
- Its only role is to serve as a building block for words.
- Because English has /t/, then the possibility exists of English having the word *tie*/taɪ/, distinct from the word *die* /daɪ/.
- In general, the only real duty of a speech sound is to sound different from the other sounds of the language.

Phonemes

- To achieve some initial understanding of a language's phonology,
- we therefore seek to locate all of its basic sounds,
- Sounds serve as the building blocks for distinguishing words from each other.
- These basic sounds are called **phonemes**
- **phoneme** = one of the basic speech sounds of a language

Phonemes of English – consonants

Phonemes of English

		Bilabial	Labio-dental	Dental	Alveolar	Palato-alveolar	Palatal	Velar	Glottal
Stops	voiceless	/p/			/t/	/tʃ/		/k/	
	voiced	/b/			/d/	/dʒ/		/g/	
Fricatives	voiceless		/f/	/θ/	/s/	/ʃ/			/h/
	voiced		/v/	/ð/	/z/	/ʒ/			
Nasals		/m/			/n/			/ŋ/	
Approximant	lateral				/l/				
	central	/w/			/r/		/j/		

Figure 1: From Fromkin, V.(2000). *Linguistics: An introduction to linguistic theory*. USA: Blackwell.

Phonemes- Vowels

Phonemes: English vowels

	Front Unrounded	Central Unrounded	Back		Diphthongs
			Unrounded	Rounded	
Upper high Lower high	/i/ /ɪ/			/u/ /ʊ/	/aɪ/, /aʊ/, /ɔɪ/
Upper mid Lower mid	/e/ /ɛ/	/ə/	/ʌ/	/o/	Syllabic Consonant
Low	/æ/		/a/		/ɾ/

Figure 1: From Fromkin, V.(2000). *Linguistics: An introduction to linguistic theory*. USA: Blackwell.

- What we have from the diagrams consist the phoneme inventory of English sounds:
- If any two words of a language are pronounced differently,
- they must differ in at least one phoneme.
- Note:
- the phoneme inventory does not contain pointless, redundant members;
- all of its members are capable of distinguishing words from each other.

Phonemic Variation

a. Phonemes vary by context.

b. The variation is rule-governed

Consider the data:

Read and then listen to a native speaker produce the vowels in each of the pair of words:

the vowel phoneme /e/ is quite a bit shorter in the second member of each pair.

the transcription is indicated by IPA shortness marker on the shorter vowels:

save	[sev]	safe	[sēf]
Abe	[eb]	ape	[ēp]
made	[med]	mate	[mēt]
maze	[mez]	mace	[mēs]
age	[edʒ]	H	[ētʃ]
Haig	[heg]	ache	[ēk]

From Fromkin, V.(2000). *Linguistics: An introduction to linguistic theory*. USA: Blackwell.

- All these words have a vowel that speakers are willing, intuitively, to accept as being the ‘same vowel’
- (despite the variable spelling).
- But phonetically, they are not the same vowel; rather, there are two variants of the same vowel
- Their production is predictable
- The variant [e] occurs when the next sound in the word is voiced (here: [v, b, d, z, dZ, g]), and [short e] occurs when
- the next sound in the word is voiceless (here: [f, p, t, s, tS, k]).

- English can then be said to have one ‘basic sound’ here, with two phonetic variants.
- The very fact that the appearance of [e] vs. [short e] is predictable is important:
- it means that the difference between the two cannot be used to distinguish words from each other; hence, non-distinctive
- In this respect, the difference between [e] vs. [short e]
- [short e] is quite different from the difference between (for example) [e] vs. [æ],
- since the latter pair can serve to distinguish words, for example *made*[med] vs. *mad* [mæd] hence distinctive

- Hence,
- for any pair of sounds it is necessary to establish their phonological status:
- either they are separate phonemes,
- capable of distinguishing words,
- or mere variants, whose distribution in the language is determined by context
- Virtually all the phonemes in English show phonetic variation, depending
- on their context

Allophonic variation

- Allophones are variants of phones.
- Phones are physical realizations of phonemes.
- Note: Phonemes are underlying representations of sounds in a speaker's mind (lexicon)
- Variations, as we have seen, arise due to different phonetic environments.

ENGLISH CONSONANTAL ALLOPHONES

- While the physical difference between t and t^h in English is just as real as the difference between *t* and *d;*
- there is a fundamental linguistic difference between these two relationships.
- The selection of *t* versus *d* may constitute the sole difference between many different words in English:
- such words are called **minimal pairs**.
- where two words are differentiated exclusively by a choice between one of two segments.

d	t
Dire	Tire
Dick	Tick
Said	Set
Do	Two
Had	Hat
Bend	Bent

From: Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press

Aspiration

ASPIRATION- Audible release of plosion that accompanies voiceless stop

The difference between [t] and [d] is c**ontrastive** (also termed **distinctive**) in English,

voicing – forms the sole basis for distinguishing different words (and thus, [t] and [d] contrast).

The choice of a voiceless aspirated stop such as [t^h] versus a voiceless unaspirated stop such as [t],

on the other hand, never defines the sole basis for differentiating words in English.

The occurrence of [t] versus [t^h] (also [k] versus [k^h], and [p] versus [p^h]) follows a rule:

- That aspirated stops are used in one **phonological context**, and unaspirated stops are used in all other contexts (Odden, 2013).
- In English, [t] and [t^h] are predictable variants of a single abstract segment, a phoneme, which we represent as /t/.
- Purely predictable variants are termed allophones – the sounds are in **complementary distribution**
- (i.e The context where one variant appears is the complement of the context where the other sound appears)

ASPIRATED STOPS

Pool	[pʰuwl]	Tooth	[tʰuwθ]	Kill	[kʰɪl]
Pit	[pʰɪt]	Tin	[tʰɪn]	Account	[əkʰæwnt]
Apply	[əpʰlaj]	Atomic	[ətʰamɪk]	Crab	[kʰræb]
Prawn	[pʰran]	Truth	[tʰruwθ]	Quill	[kʰwɪl]
Peublo	[pʰwɛblow]	Twine	[tʰwajn]	Clay	[kʰlej]
Play	[pʰlej]			Cube	[kʰjuwb]
Puce	[pʰjuws]			Coop	[kʰuwp]

From: Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press

UNASPIRATED CONSONANTS

Spool	[spuwl]	Stool	[stuwl]	School	[skuwl]
Spit	[spɪt]	Stick	[stɪk]	Skid	[skɪd]
Sap	[sæp]	Sat	[sæt]	Sack	[sæk]
Spray	[sprej]	Stray	[strej]	Screw	[skɹuw]
Split	[splɪt]			Sclerosis	[sklərowsɪs]
Spew	[spjuw]			Skew	[skjuw]

From: Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press

- Hence the phonemes will have variants:
- /p/- [ph][p]
- These variations are shown by phonetic transcription.
- It is called narrow transcription as it includes details of the results of the phonetic environment.
- What will be the variants of /k/ and /t/?

FLAPPING

- Phonetic characteristic of many North American dialects of English is “flapping,”
- where /t/ and /d/ become the flap [ɾ] in certain contexts,
- for example in [ˈwaɾɹ̩] water.
- Note that there is no contrast between the flap [ɾ] and any other consonant of English:

- there are no minimal pairs such as:
- hypothetical [hɪt] and *[hɪɾ],
- or *[bʌtɻ] and [bʌɾɻ],
- whose existence would establish that the flap is a distinct phoneme of English.
- The contexts where the flap appears in English are quite restricted.

ˈwarɹ̩ water	ˈwejɾɹ̩	waiter or wader	
ˈærm̩ atom or Adam	ˈærə̩	tʰuwd	attitude
hɪt hit			hɪrɪŋ hitting
ˈpʊt put			ˈpʊrɪŋ putting
ˈsɛt set			ˈsɛrɪŋ setting

From Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press

- Flapping is not limited to the voiceless alveolar stop /t/; underlying /d/ also becomes [ɾ] in this same context.

Base verbs	'One who V-s'	'V-ing'
ˈbɪd (bid)	ˈbɪɾɻ (bidder)	ˈbɪɾɪŋ (bidding)
ˈhajd (hide)	ˈhajɾɻ (hider)	ˈhajɾɪŋ hiding
ˈwejd(wade)	ˈwejɾɻ(wader)	ˈwejɾɪŋ (wading).

GLOTTAL STOP

- There is one context where flapping of /t/ does not occur when preceded by a vowel and followed by an unstressed syllabic segment (vowel or syllabic sonorant),
- That is when /t/ is followed by a syllabic [n̩].
- Consider, first, examples such as [ˈbʌʔn̩] button and [ˈkaʔn̩] cotton.
- Instead of the flap that we expect, we find glottal stop before syllabic [n̩].

- Consider the following pairs of words:

[rat] rot	**[ˈraʔn̩] rotten**
[hajt] height	[ˈhajʔn̩] heighten
[lajt] light	[ˈlajʔn̩] lighten
[fæt] fat	[ˈfæʔn̩] fatten

From: Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press

- The bare roots on the left show the underlying /t/ which has not changed to glottal stop, and on the right,
- we observe that the addition of the suffix /n/ conditions the change of /t/ to [ʔ]
- when t is preceded by a stressed vowel and followed by an alveolar nasal.

- notice that in casual speech;
- the gerundive suffix -ɪŋ may be pronounced as [n̩].
- When the verb root ends in /t/, that /t/ becomes [ʔ] just in case the suffix becomes [n̩],
- and thus provides the crucial context required for the glottal stop creation rule

Base verb	Careful speech	Casual speech
hɪs	hɪsɪŋ	hɪsn̩
ɹat	ɹarɪŋ	ɹaʔn̩
flowt	flowrɪŋ	flowʔn̩

From: Odden, D. (2013*). Introducing phonology*.UK: Cambridge University press

- The environment for appearance of glottal stop has been a following syllabic [n̩].
- Is it crucial that the triggering nasal segment be specifically a syllabic nasal?
- The glottal stop can occur before non-syllabic nasals in words such as Whitney [ʍɪʔnij] and fatness [fæʔnəs],
- The t-glottalization rule does not care about the syllabicity of the following nasal.
- The presence of glottal stop in these examples can be explained by the existence of a rule which turns /t/ into glottal stop before [n] or [n̩].

Alveolar stop glottal stop / __ alveolar nasal

- Notice that this rule applies before a set of segments, but not a random set: it applies before alveolar nasals, without mention of syllabicity.
- the conditioning context of phonological rules is stated in terms of phonetic properties.

References

- Fromkin, V.(2000). *Linguistics: An introduction to linguistic theory*. USA: Blackwell.
- Odden, D. (2013). *Introducing phonology*.UK: Cambridge University press.