BASIC PHONETICS AND ENGLISH PHONOLOGY

TOPIC:PHONEMES AND ALLOPHONES

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Introduction

- Phonology is the study of the distinctive sounds in a language
- we have mentioned the difference between certain distinctive and nondistinctive variants
- (for example, between [th] and [t]),
- The concept of distinctiveness is captured by the notion of a **phoneme**.
- A phoneme is a distinctive or contrastive sound in a language.
- What “distinctive” means in this context is that the sound makes a difference in meaning and has communicative value.

IDENTIFICATION OF PHONEMES

- Phonemes can be identified:
- Minimal pairs
- Complementary distribution
- Free variation
- Let’s examine each of these concepts.

Minimal pairs

- When two words are identical in all respects, except for one
- segment, they are referred to as a MINIMAL PAIR.
- Different phonemes make contrasts in words.
- For example, /n/, /l/ and /t/ are all phonemes because they serve to make contrasts in words, as in *nab*, *lab*, *tab*.
- Here we see how the phonemes of a language are determined, by means of what are called **minimal pairs**.
- A minimal pair is a set of different words consisting of all the same sounds except for one.

- The one sound which contrasts is then determined to be a phoneme since it makes a difference in meaning
- (it differentiates one word from another).
- For example, we could set up a *phonetic environment*, or a sequence of sounds, such as an environment containing the sound sequence /æt/.
- If we then establish a blank slot preceding this sequence, /_æt/, and substitute different consonants in this slot, we get different words.
- If we do, then each of these consonants is a phoneme. Examine the following:
- /_æt/: *pat*, *bat*, *sat*, *mat*, *gnat*, *fat*, *that*, *vat*, *cat* …

- We can conclude that /p/, /b/, /s/, /m/, /n/, /f/, /ð/, /v/, and /k/ are all phonemes.
- Thus, *bat* and *cat*, for example, form a minimal pair, as do *gnat* and *vat*.
- This same concept of a minimal pair holds true for vowels as well.
- Consider, for example, a phonetic environment such as /p_t/.
- Substituting different vowels in the empty slot, we can generate numerous minimal pairs:
- /p_t/: *pit*, *peat*, *pate*, *pot*, *pout*, *put*, *putt*, *pat*, *pet* …
- We can conclude that /I/, /i/, /eI/, /ai/, /e/, /æ/, and /ɛ/ are all distinct phonemes

The MINIMAL PAIR TEST

- The minimal pair test (i.e. the method of determining that a single sound difference
- distinguishes the meanings of two words) is a key principle of phonemic analysis.
- Sounds are classified as separate phonemes if they are responsible for a difference in meaning in a minimal pair.

- Another way of saying this is to state that sounds are separate phonemes,
- if they CONTRAST IN IDENTICAL ENVIRONMENTS,
- i.e. if either sound can occur in a given context;
- and the choice of one or the other does alter the meaning of a word.

List of minimal pairs

- Big Pig
- Dig Wig
- Tin din
- rice ~ lice
- mow ~ know
- seen ~ seem
- cot ~ got

Rig Fig

Bag beg

read ~ lead

room ~ loom

mice ~ nice

buck ~ bug

card ~ guard

Minimal set

- The **absence** of a minimal pair does not prove much.
- Often, a language will lack minimal pairs for a pair of relatively rare phonemes simply by accident.
- (Test this by trying to locate a minimal pair for /ʒ/ vs. /ð/ in English;
- both are infrequent.)
- An obvious generalization of the minimal pair is the minimal set.
- selecting a good ‘frame’ or phonological context will make it possible to justify quite a bit of the phonemic inventory of a language.

Minimal set

- heed [hiːd] who’d [hud]
- hid [hId] hood [hʊd]
- head [hed] had [hæd]
- hod [ˈhɒd] hide [haɪd] heard [ˈhɜːd]

Phonemes

- **Phonemes** are said to be unpredictable,
- their occurrence depends on what word you want to say rather than by any phonological rule.
- That is, whether /b/ or /k/ occurs in the environment /_æt/ depends on whether you wish to refer to the nocturnal flying mammal *bat* or to the family feline *cat*,
- not on whether the sound occurs in the context of /æ/ or word initially or any other factor which is solely phonetically determined.

Allophones

- An **allophone** (from *allos* ‘other’ *phōnē* ‘sound’) is a predictable variant of a phoneme.
- Allophones are the individual members of a class of sounds (a phoneme), or
- the pronounceable or concrete realizations of an abstraction (a phoneme).
- We speak of the phonetically similar variants of a sound as the “allophones of a (particular) phoneme”.

- To take a real example from English, consider the aspirated [t^h] and the non-aspirated [t] discussed in the previous lesson.
- They are phonetically very similar, but not identical.
- Allophones are nondistinctive (noncontrastive) variants of a phoneme,
- since substituting one allophone for another allophone of the same phoneme will not lead to a different word.
- Replacing [t^h] with [t] in top, or [t] with [t^h] in stop, will not lead to different words, just slightly odd-sounding ones.

Complementary distribution

- Allophones of a phoneme are predictable:
- are conditioned by the phonetic environment, which determines the appearance of one or another allophone.
- Thus, we can say that the aspirated version of /t/ is predicted by its position word (or syllable) initially before a stressed vowel;
- the nonaspirated version is predicted by all other phonetic environments.

- Hence, allophones are positional variants,
- which are in **complementary distribution**,
- meaning that where one occurs the other does not.
- They never occur in the same environment, always in different environments.
- They never overlap in distribution; rather, their distributions “complement” (or ‘complete’) one another.

- Our examples [t^h] and [t] never occur in the same position:
- [t^h] occurs syllable initial, and [t] occurs in all other environments.
- Thus, we can conclude that [t^h] and [t] are allophones of the phoneme /t/.
- We enclose the phoneme in slashes to indicate that it represents a class of sounds, or an abstraction.

- Note
- The *environment* in the context of phonemes and allophones is limited strictly to phonetic features,
- though it can refer to a number of such features;
- for example, it can refer to the position of the sound in the word or syllable (e.g. syllable initial or word final),
- the nature of the surrounding sounds (e.g. between vowels, following a voiceless stop, before an approximant),
- or even the placement of stress.

Free variation

- Not all phonemes can be accounted for in terms of complementary distribution
- Occasionally, allophones are in “free variation”
- This implies that the realization of one allophone rather than another appears to be a matter of chance.
- For example, stops may or may not be released word finally.
- A speaker will release or not release them arbitrarily, and whether or not they are released makes no difference in meaning.
- We cannot predict from the context which allophone will be selected.

- In some dialects of North American English,
- specifically those which do not distinguish *pin* and *pen*, the phonemes /ɪ/ and /e/ are allophones of the same phoneme.
- Economics
- / iːkəˈnɒmɪk/
- /eːkəˈnɒmɪk/
- Issue
- / ɪʃuː
- / ɪsiuː/

Phonemic inventory

- This is the inventory of distinctive sounds
- The inventory of English sounds include:
- The vowels
- The consonants

Example of Allophones

- The voiceless stop /p/ has a number of variants:

/p/ →	[p^h]/ #—Vó	*port, party, computer, apart*
	[$p^\neg$]/ —C_{stop}, —#	*capped, opt, scepter, cap, rope,*
	[p]/ elsewhere	*sport, spring, apron, proclaim, tipsy*

Giegerich, H. 1992. *English phonology: An introduction*. Cambridge University press.

- This rule says that:
- (1) the phoneme /p/ is realized as:aspirated [ph] syllable initially before a stressed vowel;
- (2) it is unreleased before another stop consonant or word finally; and
- (3) it is [p] in all other environments.

- The voiceless stop /t/ has more variants than /p/:

/t/ →	[t^h]/ #—Vó	*tongue, return, attend*
	[t^n]/ —[n, n̩]	*fitness, mitten*
	[t^l]/—[l]	*atlas, butler*
	[ɾ]/ Vó—Vo, Vó— [r̩], Vó— [l̩]	*city, matter, bottle*
	[t̪]/ —[ð, θ]	*at that, eighth*
	[t̚]/ —C_{stop}, —#	*footprint, hatpin, rat, root*
	[t]/ elsewhere	*stop, try, twin, attract, matron*

Giegerich, H. 1992. *English phonology: An introduction*. Cambridge University press.

- The phoneme /n/ also has a number of predictable variants:

/n/ →	[ɱ]/—$C_{labiodental}$	*infamous, information, confirm environment*
	[n̪]/—C_{dental}	*month, ninth, in the*
	[ŋ]/—C_{velar}	*incongruous, increase, ingrown*
	[n̩]/ $C_{obstruent}$—#	*leaden, madden, kitten, listen*
	[n]/ elsewhere	*noise, pound, tons, funny, pin*

Giegerich, H. 1992. *English phonology: An introduction*. Cambridge University press.

- This rule states that:
- (1) the phoneme /n/ is realized as the labiodental nasal before labiodental consonants;
- (2) as dentalized before the dental consonants /θ/ and /ð/;
- (3) as velar [ŋ] before velar consonants;
- (4) as syllabic word finally following obstruents;
- and (5) as [n] in all other environments

Transcription

- Earlier, we mentioned that there are two types of transcription:
- Phonemic transcription
- Phonetic transcription only the linguistically relevant detail of the phonetic form of words.
- Phonemes, while having no linguistic meaning, bear **relevant phonological information.**
- **It is called broad transcription.**

- dictionary entries usually give the spelling,
- the meaning
- and (some form of) a phonemic transcription of a word.
- Dictionaries give no redundant information –
- none of the three components of a lexical entry can be derived by any kind of rule.

- The phones of speech also contain **redundant information,** not needed to distinguish one word from another.
- This information is redundant for two reasons:
- it is *not needed for phonological contrast* and it is (largely) **predictable.**
- In *tenth*, for example, the nasal is realized as dental due to a general rule that predicts the
- 'assimilation' of the place of articulation of the nasal to that of the next consonant.

- The phonemic level contains a skeleton of information crucial to the identification of words, no more and no less.
- The phonetic level is richer in information in that it additionally contains all the phonetic detail that is linguistically redundant:
- They are not needed for contrast and predicted by realization rules.
- These two aspects of redundancy are, of course, logically connected:
- information that is predicted by an automatic rule cannot be needed for contrast;
- an automatic rule cannot possibly introduce any nonredundant information

- One word can have one phonemic transcription and more phonetic transcriptions (representation)
- Consider the word ‘pin’
- Phonemic transcription /pɪn/
- Phonetic
- A. [pʰin]- aspiration
- B. [pĩn]- the vowel can be nazalized

Summary

- Phonemes are distinctive sounds of a language.
- Variants of a phoneme are called allophones- they are not contrastive.
- Minimal pairs help us determine phonemes- there are many minimal pairs.
- Allophones occur in complementary distribution
- Free variation will not give us distinctive words but a choice by speakers depending on their accents

References

- Giegerich, H. 1992. *English phonology: An introduction*. Cambridge University press.