

Allophones

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Allophones

- Within a given language, some sounds are considered to be the same sound, even though they are phonetically distinct.
 - Same or different?
 - pool [p^huɪ] spool [spuɪ]
 - phonetically different (aspirated vs. unaspirated)
 - native speakers perceive the same sound

Allophones

- A phoneme can be pronounced in different ways according to its context.

Compare:

The difference between /t/ in : tea, eat, writer, eighth, two

The difference between /i:/ in: see, seed, seat, seen

- Therefore, a phoneme may have more than one realization.
- The different realizations of a phoneme are called allophones of that phoneme. The allophone is a variant of a phoneme.

Phonemes and allophones

- Try saying these two words: *car* and *keys*
- What's different about the initial sound in each word?
- Phonetically: [k^hɑ: c^hi:z] (^h = aspiration
c=palatal stop;)
- [k^h] and [c^h] are allophones of the / k /
phoneme.

Aspirated and unaspirated voiceless stops in English

English	
p^hu:t	pool
spu:t	spool
k^hɪl	kill
skɪl	skill
<ul style="list-style-type: none">• Complementary distribution• Predictable (no minimal pairs)• [p] and [p^h] are allophones of the / p / phoneme	

The phonemic principle

- Two or more sounds are allophones of the same phoneme if:
 - a) they have a predictable, complementary distribution;
 - b) they do not create a semantic contrast; and
 - c) they are phonetically similar.

(E.g. [l] and [ɫ] in English: [l] never occurs before consonants or word-finally, [ɫ] never occurs before vowels)

Types of Distribution

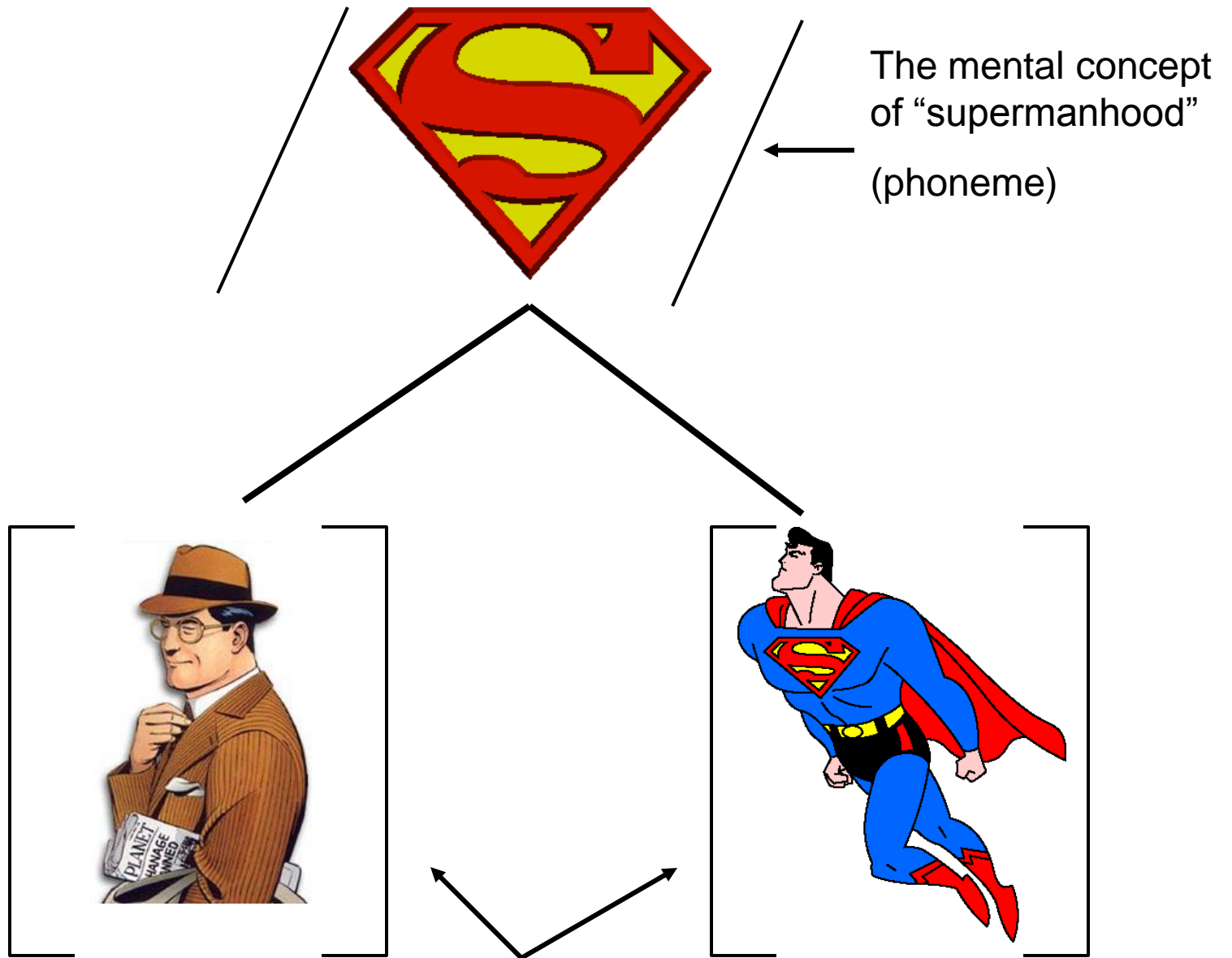
- Contrastive distribution: Two sounds are said to be *contrastive* if replacing one with the other results in a change of meaning.
 - Example:
 - 'cat' [k^hæt] and 'hat' [hæt]

Types of Distribution Cont.

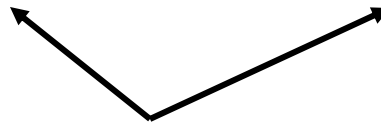
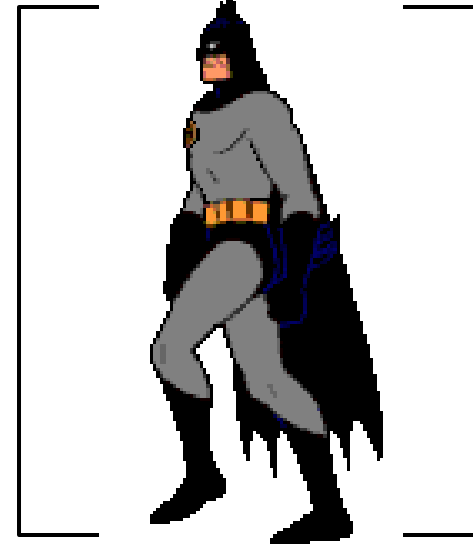
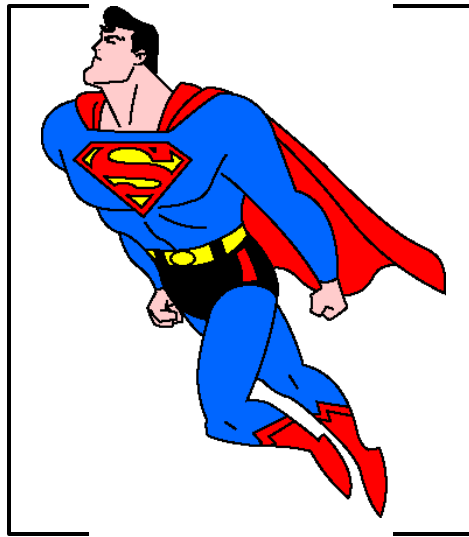
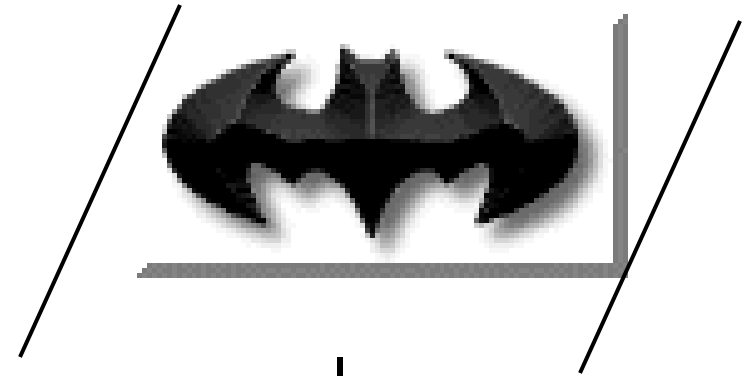
- Complementary distribution: phones appear in differing environments; are allophones of the same phoneme
 - Example:
_____ 'top' [t^hap] and 'stop' [stap]

Types of Distribution Cont.

- Free Variation: phones appear in exactly the same environments; no difference in meaning; are allophones of the same phoneme.
 - Example:
 - 'economics' [i] or [E] initially

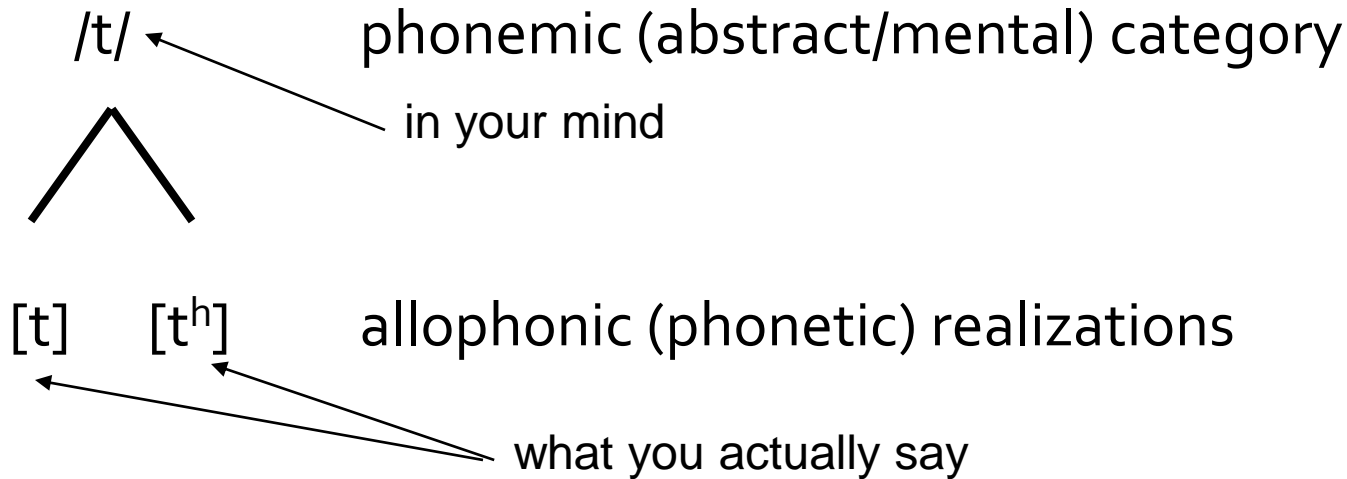


In complementary distribution: never seen in the same place at the same time. Allophones!



NOT in complementary distribution: can both be present at the same time:
allophones of *different* phonemes

Phonemes & Allophones



Bracketing convention

- slashes enclose phonemes: /t/
- square brackets enclose allophones: [t]
- This is an important distinction!

Variation in sounds:

The case of “t” in American English

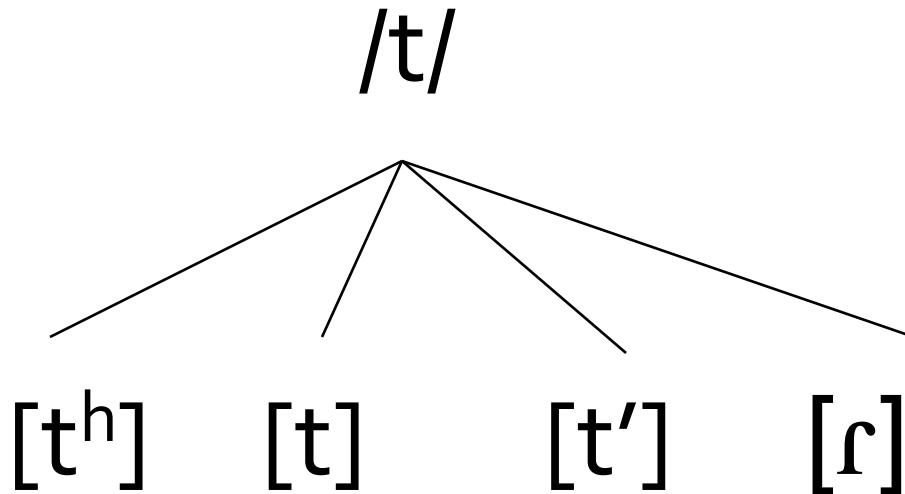
- Say the following words:
 - *top, stop, metal, and right*
- What is the difference between the four “t”s?
 - top [t^hap] the “t” is aspirated [t^h]
 - stop [stap] the “t” is unaspirated [t]
 - metal [mɛrl] the “t” is a flap [ɾ]
 - right [raitʰ] the “t” is unreleased [tʰ]

The case of “t” in American English

- The sound we perceive as “t” actually has four phonetic realizations
- Since in our mind, the abstract sound is still a “t” we call “t” a **PHONEME**.
- Phones go in brackets [t], phonemes go in slashes /t/
- Every language has phonemes and variants of that phoneme, which we call **ALLOPHONES**
- Appearance of allophones depends on **rules**

Phonemes and Allophones

- What are the rules for the different allophones of /t/?



Allophonic rules for /t/:

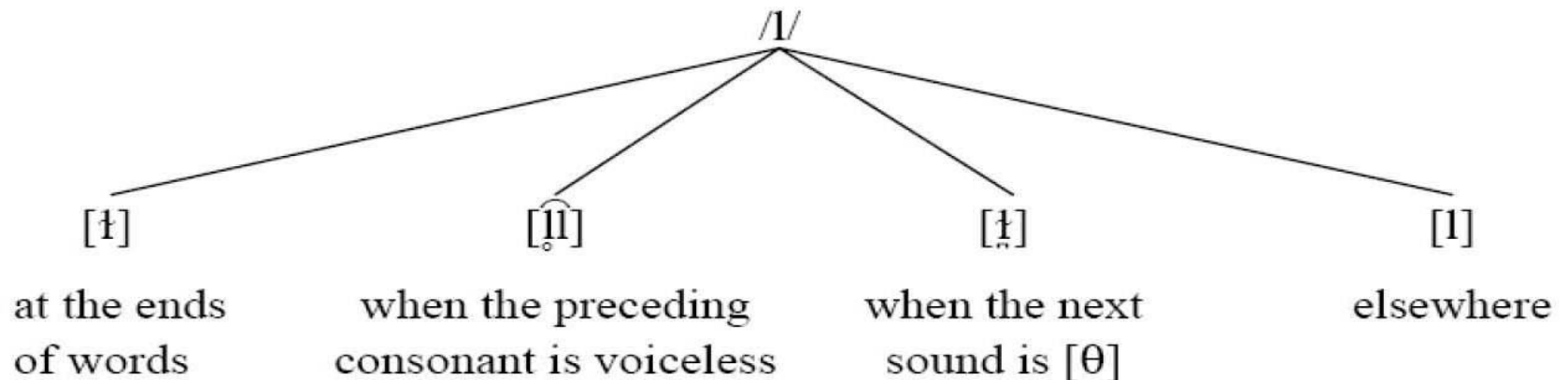
- /t/ → [t^h] word-initially and in front of stressed syllables
 - table, treat, attend, until, attack
- /t/ → [ɾ] intervocalically, when second vowel is unstressed
 - better, Betty, butter, cutie, buttocks
- /t/ → [t'] word-finally
 - set, right, caught, pit
- /t/ → [t] elsewhere
 - stop, street, antics, Baltic

Allophones of /l/ in English

(Hayes)

Words with [ɫ]	Words with [ɫ̥]	Words with [ɫ̥]	Words with [l]
file [ˈfaɪɫ]	slight [sɫ̥aɪt]	wealth [ˈweɪɫ̥θ]	listen [ˈlɪsən]
fool [ˈfuɫ]	flight [ˈflaɪt]	health [ˈheɪɫ̥θ]	lose [ˈluːz]
all [ɔɫ]	plow [ˈpləʊ]	filthy [ˈfɪɫ̥θi]	allow [əˈlaʊ]
ball [ˈbɔɫ]	cling [ˈkɪŋ]	tilth [ˈtɪɫ̥θ]	aglow [əˈɡloʊ]
fell [ˈfɛɫ]	discipline [ˈdɪsəpɫ̥ɪn]	stealth [ˈsteɪɫ̥θ]	blend [ˈblend]
feel [ˈfiɫ]			

The pattern turns out to be as follows:



Rules describing /l/

Underlying representation: /l/

Phonological rules:

/l/ Devoicing

$$/l/ \rightarrow [l̥] \quad / \left[\begin{array}{l} +\text{consonant} \\ -\text{voice} \end{array} \right] \text{---}$$

/l/ Dentalization

$$/l/ \rightarrow [l̪] \quad / \text{---} \theta$$

/l/ Velarization

$$/l/ \rightarrow [l̠] \quad / \text{---}]_{\text{word}}$$

Phoneme test

- Are these sounds in complementary or similar distribution?

bat, pat } only in **similar distribution**,
dun, ton } these are different phonemes

p^hin, spin } only in **complementary distribution**
t^hon, stun } these are the same phoneme

Phoneme test

- Are these sounds in complementary or overlapping distribution?

bat, pat } overlapping distribution,
dun, ton } these are different phonemes

p^hin, spin } complimentary distribution
t^hon, stun } these are the same phoneme

Phonemes vs. allophones

- Recognized by speakers as separate sounds
- Differentiate between words (kill/dill/will), so they appear in **overlapping *distribution*** with each other (all at the same place in a word)
- Phonemes are the separate sounds of a language

- Speakers hear them as the same sound
- Allophones are different versions of the same phoneme, so they never appear in the same place in a word: t^hun, but not st^hun. "st^hun" and "stun" aren't different words.
- That means allophones of a single phoneme appear in *complementary distribution*.