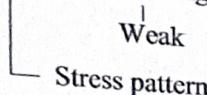


## In the neighbourhood

1. Characteristics of the words themselves affect how easily they're learned.  
[Word frequency → how often a word in all form occur in language]  
fxn words (the, of) — frequent  
content word — less common
- Children learn real words more often than new nouns first. Followed by verbs, adjectives and don't use function words regularly.
2. Neighbourhood density: how many other words differ from a particular word by substitution of a single phoneme.  
Hat → cat, rat [first phoneme]  
    ↳ hot, hit [second phoneme]  
    ↳ hair, have [third phoneme]

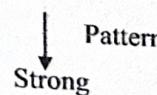
- Phonotactic probability – the likelihoods that a particular sequence of phonemes will occur in a language.
- Stress pattern can also influence word learning in youngster.

2 syllable nouns (trochaic, Strong)



e.g. basket and pillow

Iambic - Weak



e.g. guitar, amount

- Infant use metrical segmentation strategy to infer word boundaries before stressed syllables.
- Ester (2013) found that infants need support both from stress pattern and phonotactic regularities to learn words.

## How words are learned

Mental lexicon → the storage of info about words in long-term memory.

Phonological info      Semantic info  
(pronounce)            (meaning)

Phonological form (how phonological words form are stored in mental lexicon)

- Word form → set of phonemes  
(stored)  
(speech errors)  
[e.g. keep your feet moving from]  
Very common words are stored as syllables.
- Only basic form of word is stored in memory, other forms are generated through rule  
[lemma books, (gen) books]
- Evidence → we can easily generate plural for non-words.

## Exploring mental lexicon

- What comes to mind when we say dog
  - cat
  - bone
- Exploring mental lexicon is
  - word association task – a simple procedure in which the participants are asked to produce a word in response to a prompt.
- Word in mental lexicon
  - ↓
  - semantically related
  - ↓                  ↓
  - dog-bone            dog-cat
  - (thematic relation)      (taxonomic relation)
  - Word relation based
  - Frequency of co-occurrence
  - [associative relation]
  - word relation of the same category (animals)
  - [categorical relation]

## → Network Model (Collis & Quillian, 1969)

- Mental lexicon as n/w of concepts connected by semantic links.
- CANARY  $\begin{matrix} \text{IS A} \\ | \end{matrix}$  BIRD, BIRD  $\begin{matrix} \text{HAS} \\ | \end{matrix}$  WINGS

Categorical

Semantic

Hence we know @ Canary has wings

## ★ Semantic priming tasks -

→

→ Participant performs lexical decision task on second word.

- DOCTOR, NURSE → YES
- DOCTOR, NARSE → NO

## ★ Semantic priming effect -

→ Target words recognise faster when preceded by related than unrelated prime

- DOCTOR, NURSE → faster reaction time
- DOCTOR, SPOON → slower reaction time

## ★ Picture word interference task

→ Participant sees picture (word, name picture, ignore) word

→

## ★ Semantic interference effect.

→ Taxonomic relations yield slower reaction times.

→ Reaction time : HORSE-CAT > HORSE-TABLE

→ Categorically related words compete for selection.

## ★ Semantic facilitation effect

→ Thematic relations yield faster reaction times.

→ Reaction time : WHISKERS-CAT < WHISKERS-TABLE

→ Associatively related words don't compete for selection.

- Psycholinguist conceptualize the mental lexicon as a network of words or concepts connect other by semantic links between nodes labelled by type of relationship.

ISA  $\longrightarrow$  categorical

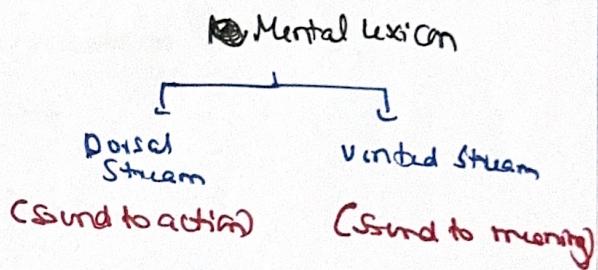
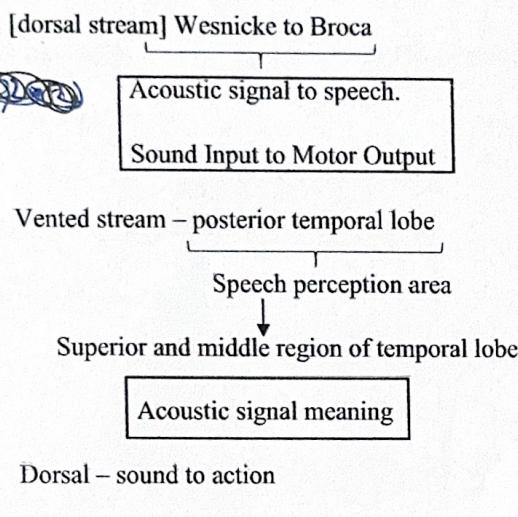
HAS, CAN → semantic

**Spreading Activation Model** – proposes activation of one node spread out to other nodes linked to it. (Collins & Loftus, 1975)

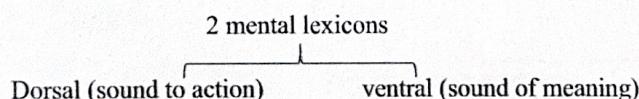
- Priming can measure associative strength between word.
  - Semantic priming task – experimental technique that present a pair of word and measure the participants reaction time.
  - Target word are recognized faster which preceded by related primes then unrelated primes – semantic priming effect.

## Categorical organization of mental lexicon

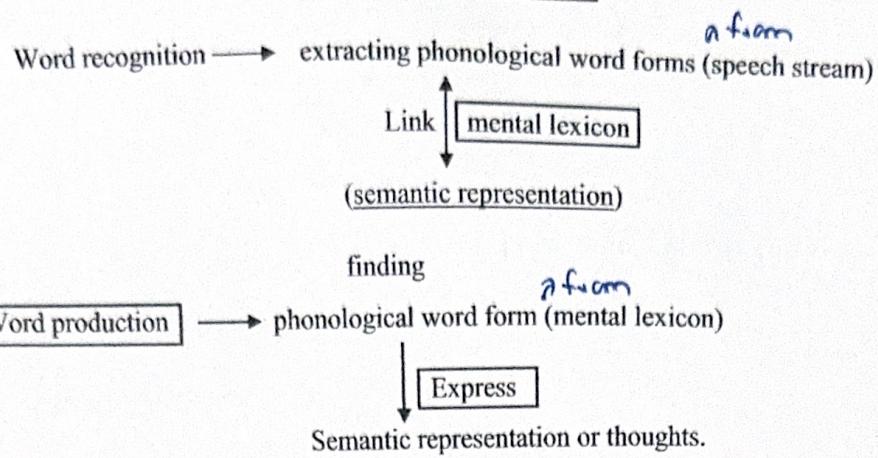
Hickok and Poeppel's (2007) dual stream model propose – the dorsal stream extends from the speech perception area (posterior temporal lobe) to posterior frontal lobe.



Supramarginal gyrus Region of  
inferior parietal lobe, adjacent  
to lateral fissure.  
→ Phonological word forms may be  
stored in this area.



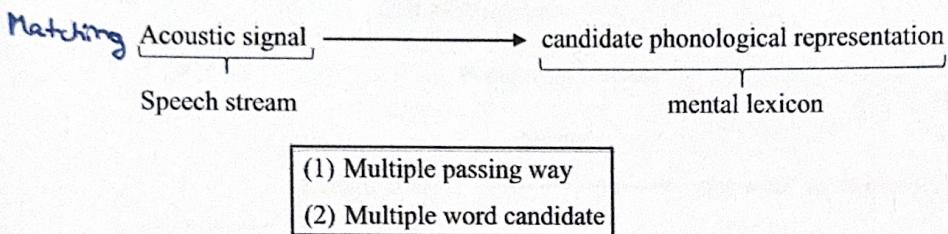
## How words are retrieved of



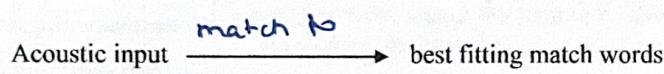
## Spoken word recognition

Q [Marslen – Wilson 1987] Hearing (word) – Meaning (word) has three steps

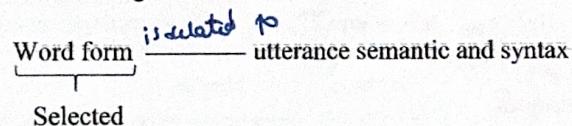
Step 1: Lexicon access:



Step 2: lexical selection



Step 3: lexical integration



## 2 Cohort model of word recognition

Cohort is the set of all words that begin with the same sequences of phonemes

E.g. e-/e = elephant

elevator

elegant

elementary

add another cohort c-/e-f = elephant

The point at which a string of Phonemes provides enough evidence for identifying a word is known as that words "RECOGNITION POINT".

→ Model of word recognition proposing that listeners initially consider all possible word matches to the incoming all possible word matches to the incoming speech stream but identify the word as soon as a recognition point is reached.

### Extracting possible word from speech

Bottom-up process → Driven solely by i/p without consideration of context or expectations  
primes

Even if context → one word all words of cohort are active.

### Evidence for cohort model

Gather task

- Shadowing task → Participant asked to repeat continuous flow of speech out loud as quickly as possible. Typically lag of 200ms, before complete word is heard.

- Adjusting task

Word in sentence - 200m/sec.

Participant presented with increasingly long increment of word, asked to guess what it is.

Word isolation - 300 m/sec

→ Illustrates recognition points.

Sentence superiority effect

→ Improved ability to identify word within sentence as opposed to by itself.

benefit

context

200ms in sentence, 300ms alone.

Lexical selection

Expectation

Top-Down Process → Influenced by Context or expectation.

→ Word frequency effect → Common words recognized more quickly than less common words.

→ Visual world paradigm → Participants interact with objects or pictures according to spoken instructions.

(2) Object names are from the same cohort)

(3) Older adults more likely detect higher frequency item when lower frequency item named.

## Spoken word production

2 stages

- (1) Lexical selection – particular concept to abstract word form (lemma). e.g. Dog → dog, PUPPY, house, Pbach, Pndl, ...
- (2) Phonological encoding

Abstract word form (lemma) – phonological reproduction.

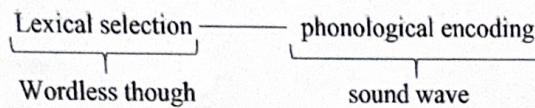
1. No semantic relation but meaning and sound

2. TOT abstract lemma level exists. → *lexical analysis without phonological encoding*

How info flow through step 1 to step 2

- Feed forward model
- Interactive model

The level feed forward model



6 stages connected serially

(1) Feed forward. → *serial fashion*

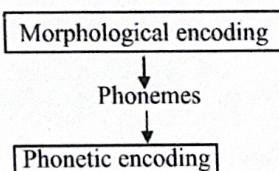
(2) Feedback (a monitor process)

(1) Think without language

↓  
(2) Lexical concept (word expressing)

Concept — lemma — word

↓  
Shape of lemma modified (syntax and semantic)



Phonetic structural code

Articulator

Gesture score – musical score read out of geslun

① Conceptual preparation → lexical concept

② Lexical selection → Lemma (basic concept)

③ Morphological encoding → Add inflectional morphemes as needed

④ Phonological encoding → Convert to phonemic string

⑤ Phonetic encoding → Gesture score (motor commands to articulators)

⑥ Articulation → Sound wave

⑦ Self monitoring → Feedback from sound waves to conceptual preparation

BABY CATS

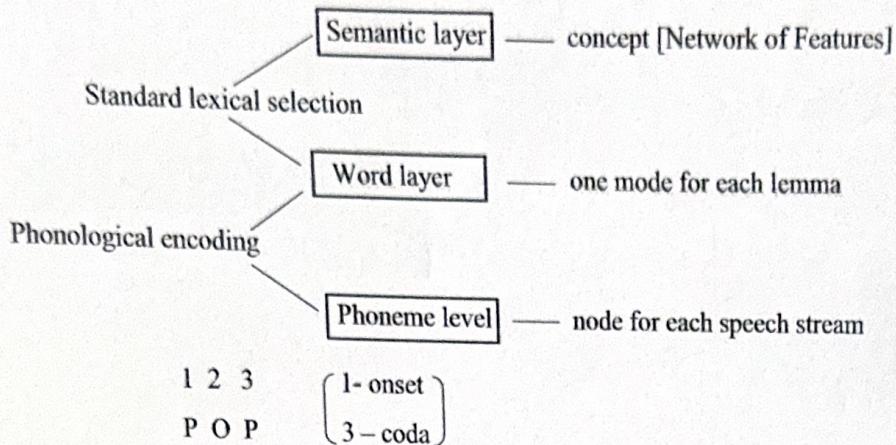
KITTEN ↗

K-i-t-uh-n-e-z

↓  
Speech organs

The Dell interactive model → Interaction model  
 Speech error in healthy people → High & low level of processing influences each other.

### 3 layers



### Dell model

- Accounts for speech errors in healthy (& brain damaged) population
- PS obtained through picture naming (& other word production tasks).

**Layer 1** → Semantic → Concepts distributed across m/w of feature nodes  
 → Semantic neighbours (Concepts with related meanings) have overlapping feature nodes.

**Layer 2** → Word layer → One mode for each lemma (abstract word form)

**Layer 3** → Phoneme layer → One mode for each phoneme, tagged with syllable position.  
 → P o P → p (onset) + o + p (onset)

Two processing stages ←

(1) Lexical selection → b/w semantic & word layers

(2) Phonological encoding → b/w word & phoneme ~~last~~ layers