

## Mental Lexicon

What words are stored in the mind? How are words accessed? How are words related to each other?

Various hypotheses:

- 1-Full parsing
- 2-Full listing
- 3-Race between parsing and access to whole word
- 4-Dual-route: depends on regularity of word
- 5-Interconnections and analogy

**Full parsing:** (eats, ate, went, invention, reinvent, conceivable, impeccable, eating)

Lexicon: *eat, -s, ing, ate, went*  
*re-, invent, -ion*  
*con-, -ceive, -cept*  
*in-, pecc, -able*

Processing: Rules used to put morphemes together in correct sequence and to make sound/spelling changes (e.g. invent + ion)

Advantages: New words formed and understood by using already existing rules. Small lexicon.

Problems: Lots of computation. People don't see all morphological relationships. Where do you draw the line? Complex words don't take more time than simple words to recognize.

**Full Listing:**

Lexicon: *eats, ate, went, invention, reinvent, conceivable, impeccable, eating* stored as individual units.

Processing: None required. Simple dictionary look up.

Advantages: No processing.

Problems: How do you account for inflection of new words? (e.g. googled, blogging). Some sort of process is needed.

**Dual-route:** Regulars are not stored as units but irregulars are.

Lexicon: Regulars: *eat, -s, -ing, re-, invent, -ion, -able, conceive*  
Irregulars: *ate, went, conception, impeccable*

Processing: Irregulars are stored as wholes and regulars are strung together in production and parsed in perception.

**Interconnections and Analogy**

Lexicon: All words stored as wholes but are interconnected based on semantic, orthographic, phonetic similarity.

Processing: Accessing a word causes other related words to be partially activated. Morphemes are identified, but full words are stored, not morphemes.

p a n e s

a n i m a l e s

m o t o r e s

m o r a l e s

m o r a l

m u e r e

m o r i r

m o r i a

d o r m i a

t e n i a

p o n i a

m o r a s

m o r a

m o r o

m o r o s

m e d i c o s

i n d i o s

l o c o s

s p o i l  
s p o i l i η

p l e i  
p l e i i η

r æ m  
r æ m i η

b æ n  
b æ n i η

**Dual-route claim:** Any time a difference on a test is found between regular and irregular words, that is evidence that regulars are processed in one way and irregulars in another.

1-Adults and children regularize irregular verbs more than they irregularize regular verbs:

regularization: go > goed, ox > oxes, child > childs  
irregularization: ax > axen, pat > pat

BUT: Regulars outnumber irregulars, and irregulars fall into small clusters, while regulars have many different phonological shapes (scattered in contextual space).

2-irregulars don't prime as well as regulars (ring priming rang versus plant priming planted)

BUT: With longer lag both prime equally well. May be due to episodic influences.

3-Jaeger's study.

Tasks: 1-Read regular verb  
2-Read regular verb and say past tense-38ms longer than in #1  
3-Read irregular verb and say past tense-238ms longer than the average time to say verbs (repeated verbs were both regular and irregular)

Brain areas activated in inflecting reg and irreg are different, but if both reg and irreg are looked up in mental lexicon there shouldn't be a big difference.

Problem: All regular were done at same time, then all irregular. During reg session you remember verb and just add -ed. During irreg session more is entailed. They couldn't mix reg and irreg. Subjects forced to adopt different strategies in both parts.

4-MRI-can mix reg and irregular test items. They find different cortical areas used.

1-Possibility that regs and irregs are stored differently, but not processed differently.  
2-Regulars have more neighbors than irregulars.

5-Frequency effects. Found for irregulars (storage) not for regulars (inflection).

	*
High Freq	
	*
	*
Low Freq	
	*
Regular	Irregular

Connectionist models (single-route) can show frequency effects.

6-Brain damage can selectively affect reg or irreg morphology.

So can 'damaged' connectionist networks.

So can AM when fewer verbs are 'remembered' to analogize on.

7-Nonce word study.

1 Nonce words with similarities to irregular verbs:

A Prototypical psuedo irregular verbs (*froe*)

B Intermediate psuedo irregular verbs (*voe*)

C Distant psuedo irregular verbs (*nist*)

2 Nonce words with similarities to regular verbs:

A Prototypical psuedo regular verbs (*treem*)

B Intermediate psuedo regular verbs (*ploab*)

C Distant psuedo regular verbs (*trilb*)





