05 - Morphological representation and processing

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Newcastle University

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- 1 Non-word roots

Evidence for 2 sys.

Proc vs Decl

- Crit. of DR model
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- (2) The role of frequency

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- Look at these examples. What does the suffix 'mouth' mean? How do you pronounce it in each word?
 - 1. Portsmouth
 - 2. Plymouth
 - 3. Tynemouth
 - 4. Grangemouth
 - 5. Cockermouth

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1. A computational system

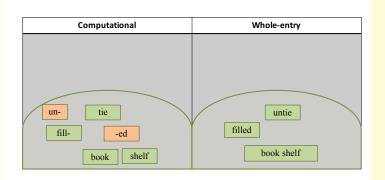
Words are generated by taking a root and adding an affix (combinatoric symbolic rule)

e.g. meaning of laughed is composed of two parts: LAUGH + PAST TENSE

2. A lexical system

Morphologically complex words are stored / processed as wholes in the **lexicon**

Computational system versus lexical storage



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3. There are two wug-s

4. Look! The dog is meek-ing 5. The dog was un-meek-able

1. He merengu-ed his way onto the dance floor

2. She was so angry that she crutch-ed her boyfriend

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1. Productive usage

Berko-Gleason's 'Wug test'



THIS IS A WUG.





NOW THERE IS ANOTHER ONE.

THERE ARE TWO OF THEM.

THERE ARE TWO _____.

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2. Morphological movement, stranding and substitution errors

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- 1. She wash upp-ed the dishes.
- 2. I'd forgot about-en that
- 3. We have a lot of church-es in our minister
- 4. She always pack-s a keep
- 5. He gave me some good **de**-vice

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Туре	Example	RT
Real infl.	Fill ed -fill	
Pseudo infl.	Mil d -mile	
Novel infl.	Nill ed -nill	
No infl.	Bel t -bell	

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Туре	Example	RT
Real infl. Pseudo infl. Novel infl. No infl.	Fill ed -fill Mil d -mile Nill ed -nill Bel t -bell	949

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Example	RT
Fill ed -fill	949
Mil d -mile	932
Nill ed -nill	
Bel t -bell	
	Fill ed -fill Mil d -mile Nill ed -nill

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Туре	Example	RT
Real infl.	Fill ed -fill	949
Pseudo infl.	Mil d -mile	932
Novel infl.	Nill ed -nill	908
No infl.	Bel t -bell	

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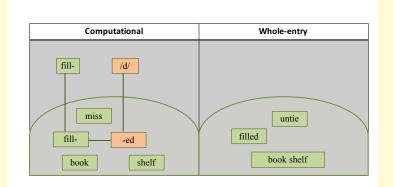
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Туре	Example	RT
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Novel infl.	Nill ed -nill	908
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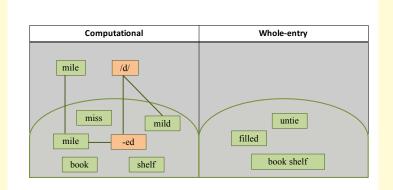
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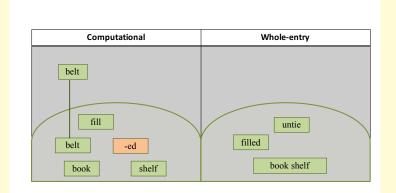
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4 Phonotactic evidence

lost \rightarrow frost, accost, riposte swam \rightarrow dam, tram, ham turn**ed** \rightarrow spurn-**ed**, learn-**ed**, earn-**ed** 05 - Morphological representation and processing

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Un-re-mitt-ing-ly
 It's in-evit-able

3. The food supplies were de-**plet**-ed

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Agent / instrument ambiguity

Stripp**er** Garden**er**

Cooker

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Losiewicz (1995) $laps \longrightarrow lapse \rightarrow$

 $hovered \longrightarrow covered \rightarrow$ knea**ded** \longrightarrow nee**ded** \rightarrow

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Losiewicz (1995)

 $laps \longrightarrow lapse \rightarrow$

 $hovered \longrightarrow covered \rightarrow$

 $kneaded \longrightarrow needed \rightarrow$

Alegre & Gordon (1999)

Relation between speed of lexicality judgement and frequency of inflected form only when inflected form exceeds a specific frequency threshold (1 word per 7 million)

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Strong evidence for two systems

Novel inflected forms, e.g. meek-ed

Non-word roots, e.g. un-remitt-ing-ly

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Strong evidence for two systems

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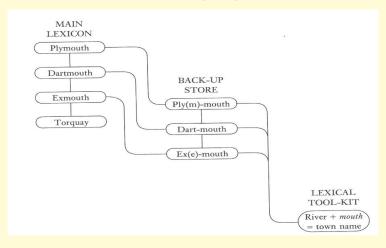
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Aitchison, 'Words in the Mind' (2002)



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*Chicken***less** *nuggets* ⇒ A careless person \Rightarrow A gormless/ruthless person



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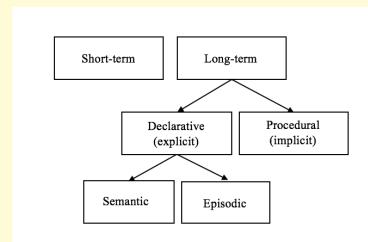
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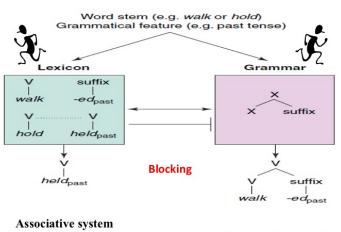
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Analogy-based

Frequency dependent



Computational system
Not frequency dependent

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Pinker & Ullman (2002) - Frequency effects are only found in the irregular system

1. Children's overregularisation errors, e.g. she swammed are determined by the density of the irregular neighbourhood

e.g. [$swim \rightarrow swam$, $sing \rightarrow sang$] versus [$bring \rightarrow brought$, $buy \rightarrow bought$, $seek \rightarrow sought$, $teach \rightarrow taught$, $fight \rightarrow fought$]

2. Adult generation of inflected form is affected by input frequency only in the irregular system.

Analogy = the mapping of relationships

What is the past tense of *tring*?

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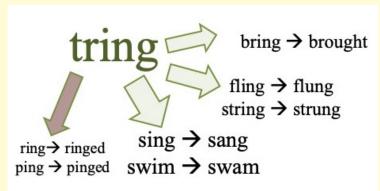
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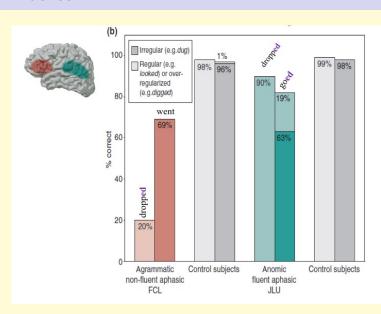
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Analogy = the mapping of relationships

What is the past tense of *tring*?





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Declarative memory affected REG. >better than >IRREG.

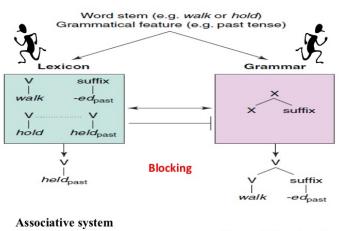
Wernicke's type aphasia

IRREG. >better than >REG.

Procedural memory affected

Dev. Lang. Disorder **Parkinsons**

Broca's type aphasia



Associative system
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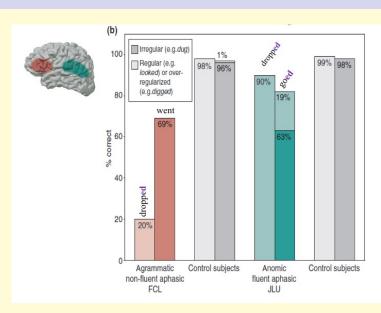
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Criticism of the dual route model

Joanisse & Seidenberg, 1999. Irregular system shows characteristics of regular system $meet \rightarrow met, \ let \rightarrow let, \ put \rightarrow put, \ shut \rightarrow shut$ $goose \rightarrow geese, \ mouse \rightarrow mice, \ moose \rightarrow moose.$ 05 - Morphological representation and processing

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Criticism of the dual route model

Frequency **does** play a role in regular morphology.

e.g. Losiewicz and Alegre & Gordon studies cited above

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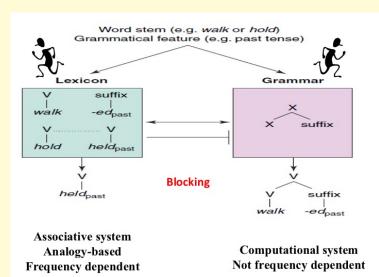
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Which one of these sentences did Yoda say in the Star Wars trilogy? Can you explain the reasons behind your choice?

- 1. Have become powerful you. You the dark side I sense in.
- 2. Powerful you have become. The dark side I sense in you.
- 3. Become powerful you have. The dark I sense in you side.

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