05 - Morphological representation and processing

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05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Evidence for comp sys.

- 1. Productive usag
- 2. Morph errors
- 3. Morpho-phon. parsing
- 4. Phonotactic evidence

Whole-wd. storage

- Non-word roots
 Multiple meanings
- Multiple meanings
 Psycholinguistic evidence
- A hybrid view

Evidence for 2 sys.

Gradient phenomena

Dual Route Model

Proc. vs. Decl. The model

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

minute exercise

processing Nick Riches Introduction Introduction 1 Non-word roots Evidence for 2 sys.

05 - Morphological representation and

Proc vs Decl

Crit of DR model

(2) The role of frequency

05 - Morphological representation and processing

Nick Riches

Introduction

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

- 1 Non-word roots
- Evidence for 2 sys.

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

processing Nick Riches The big debate The big debate

05 - Morphological representation and

Proc vs Decl

Evidence for 2 sys.

1 Non-word roots

Crit of DR model

(2) The role of frequency

Computational system versus lexical storage

05 - Morphological representation and processing

Nick Riches

Comp. versus Lex.

- 1 Non-word roots

Evidence for 2 sys.

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

1. A **computational** system

Words are generated by taking a root and adding a stem (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

	processing
Introduction	Nick Riches
	Introduction
The big debate	The big debate
	Comp. versus Lex.
Evidence for a computational system	Evidence for comp. sys.
	Productive usage
Evidence of the whole-word storage of	Morph errors Morpho-phon. parsing
	Phonotactic evidence
	Whole-wd. storage
A hybrid view	Non-word roots Multiple meanings
	Nutriple meanings Psycholinguistic evidence
Morphology in language impairments - Ullman and Pinker's	A hybrid view
	F : 1

Proc. vs. Decl.

The model

05 - Morphological representation and

Evidence

Crit. of DR model

(1) Pseudo-regularity

(2) The role of frequency

5-minute exercise

1. Productive usage

Nick Riches

05 - Morphological

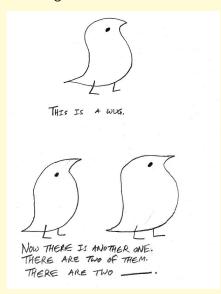
representation and processing

- Introduction
- Comp. versus Lex.
- Evidence for comp sys.
- 1. Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsing
- 4. Phonotactic evidence
- Whole-wd. storage
- 1. Non-word root
- 2. Multiple meanings
- I. Psycholinguistic evidenc
- A hybrid view Evidence for 2 sys.
- Gradient phenomena
 - ual Route Model
- he model
- Crit. of DR model
- Crit. of DR model
- (2) The role of frequency
 -
 - illitute exercise

- 1. He merengu-ed his way onto the dance floor
- 2. She was so angry that she crutch-ed her boyfriend
- 3. There are two wug-s
- 4. Look! The dog is meek-ing
- 5. The dog was **un**-meek-**able**

1. Productive usage

Berko-Gleason's 'Wug test'



05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Evidence for comp sys.

Productive usage

- 2. Morp
- 3. Morpho-phon. parsin
- 4. Phonotactic evidence

Whole-wd. stor

- Non-word roots
 Multiple receipt
- 2. Multiple i
 - 3. Psycholinguistic eviden

A hybrid view Evidence for 2 sys.

Gradient phenom

Dual Route Model

Proc. vs. Decl. The model

- Evidence Crit. of DR model
- (1) Pseudo-regularity
- (2) The role of frequency

5-minute exercise

2. Morphological movement, stranding and substitution errors

3. We have a lot of church-es in our minister

1. She wash upp-ed the dishes.

2. I'd forgot about-en that

4. She always pack-s a keep

5. He gave me some good **de**-vice

05 - Morphological representation and processing

Nick Riches

- 2. Morph errors

- 1 Non-word roots

Crit. of DR model

(2) The role of frequency

05 - Morphological representation and processing Nick Riches

3. Morpho-phon, parsing

1 Non-word roots

2. Multiple meanings

Evidence for 2 sys.

Crit. of DR model

(2) The role of frequency

Speeded same / different judgement with male and female voices

> Type Example RT Real infl. Filled-fill Pseudo infl. Mild-mile Novel infl. Nilled-nill No infl. Belt-bell

representation and processing

Nick Riches

05 - Morphological

Introduction

The big debate

Evidence for comp sys.

Productive usage

Morpho-phon, parsing

4. Phonotactic evidence

Whole-wd. storage

1. Non-word roots

Multiple meanings
 Psycholinguistic evider

A hybrid view Evidence for 2 sys.

Gradient phenomena

ual Route Model

The model
Evidence

Crit. of DR model

(1) Pseudo-regularity
(2) The role of frequency

The role of frequency

Speeded same \slash different judgement with male and female voices

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

representation and processing

Nick Riches

05 - Morphological

Introduction

The big debate
Comp. versus Lex.

Evidence for compa

Productive usage

Morpho-phon. parsing

4. Phonotactic evidence

Whole-wd. storage

1. Non-word roots

Multiple meanings
 Psycholinguistic eviden

A hybrid view
Evidence for 2 sys.

Gradient phenomena

ual Route Model

The model Evidence

Crit. of DR model

(1) Pseudo-regularity
(2) The role of frequency

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Туре	Example	RT
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Pseudo infl.	Mil d -mile	932
Novel infl.	Nill ed -nill	
No infl.	Bel t -bell	

05 - Morphological representation and processing Nick Riches

The big debate

Evidence for comp sys.

- 1. Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsing

4. Phonotactic evidence

- Whole-wd. storage
- Non-word roots
 Multiple meanings
- 3. Psycholinguistic evide

A hybrid view Evidence for 2 sys.

Gradient phenomena

Proc. vs. Decl.

- Evidence Crit. of DR model
 - 1) Pseudo-regularity
- (2) The role of frequency
- minute exercise

7/28

Speeded same / different judgement with male and female voices

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	

05 - Morphological representation and processing Nick Riches

Introduction

The big debate
Comp. versus Lex.

Evidence for compa

1. Productive usage

Morph errors
 Morpho-phon, parsing

Worpho-phon. parsing
 Phonotactic evidence

Whole-wd. storage

Non-word roots
 Multiple meaning

3. Psycholinguistic evid

Evidence for 2 sys.

Gradient phenomena

Proc. vs. Decl.

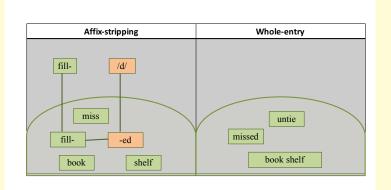
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(2) The role of frequency

Speeded same $\ /\$ different judgement with male and female voices

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Real infl.	Fill ed -fill	949
Pseudo infl.	Mil d -mile	932
Novel infl.	Nill ed -nill	908
No infl.	Bel t -bell	806



05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Evidence for compa

- 1. Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsing
- 4. Phonotactic evidence

hole-wd. storage

- 1. Non-word roots
 - Multiple meanings
- 3. Psycholinguistic evidence

A hybrid view
Evidence for 2 sys.

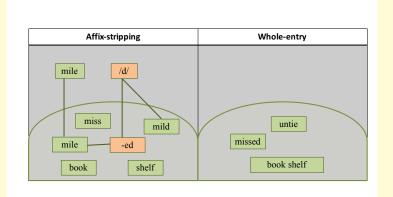
Gradient phenomen

Dual Route Model

The model

- Evidence Crit. of DR model
- Crit. of DR model
 (1) Pseudo-regularity
 -) T seudo-regulari
- (2) The role of frequency

minute exercise



05 - Morphological representation and processing

Nick Riches

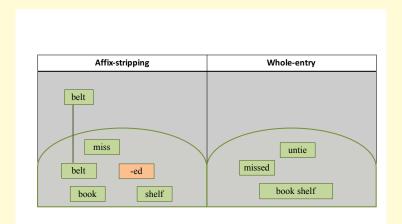
- 3. Morpho-phon, parsing

- 1. Non-word roots

A hybrid view Evidence for 2 sys.

Evidence

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



05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Comp. versus Lex.

Evidence for comp. sys.

- 1. Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsing
- 4. Phonotactic evidence

hole wid storage

- 1. Non-word roots
- 2. Multiple meanings
- 3. Psycholinguistic evidence

A hybrid view Evidence for 2 sys.

Dual Route Model

Proc. vs. Decl.

- Evidence
- Crit. of DR model
- (1) Pseudo-regularity
- (2) The role of frequency

-minute exercise

4. Phonotactic evidence

processing Nick Riches

lost \rightarrow frost, accost, riposte swam \rightarrow dam, tram, ham $turned \rightarrow spurned$, learned, earned

05 - Morphological

representation and

- 4 Phonotactic evidence

- 1 Non-word roots

Evidence for 2 sys.

Evidence

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

representation and processing Nick Riches

Evidence of the whole-word storage of morphologically-complex words

05 - Morphological

Whole-wd. storage

1. Non-word roots

Evidence for 2 sys.

Proc. vs. Decl.

Crit of DR model

(2) The role of frequency

1. Non-word roots

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

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

05 - Morphological representation and processing

Nick Riches

ntroduction

The big debate
Comp. versus Lex.

Evidence for comp sys.

- 1. Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsii
- 4. Phonotactic evidence

Nhole wd storag

1. Non-word roots

2. Multiple meanings

Psycholinguistic evident

A hybrid view Evidence for 2 sys.

Gradient phenomena

Dual Route Mode Proc. vs. Decl.

Evidence

Crit. of DR model

(1) Pseudo-regularity

(2) The role of frequency

The fole of frequency

ninute exercise

2. Multiple meanings

Agent / instrument ambiguity

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

Cooker

05 - Morphological representation and processing Nick Riches

1. Non-word roots

2. Multiple meanings

A hybrid view

Evidence for 2 sys.

Proc. vs. Decl.

Evidence

Crit. of DR model

(1) Pseudo-regularity

(2) The role of frequency

3. Psycholinguistic evidence

Loscewicz (1995)

 $laps \longrightarrow lapse \rightarrow$

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

05 - Morphological representation and processing

Nick Riches

1 Non-word roots

3. Psycholinguistic evidence

A hybrid view

Evidence for 2 sys.

Proc vs Decl

Crit. of DR model

(1) Pseudo-regularity

(2) The role of frequency

3. Psycholinguistic evidence

05 - Morphological representation and processing

Nick Riches

1 Non-word roots

3. Psycholinguistic evidence

Crit. of DR model

(2) The role of frequency

Loscewicz (1995)

 $laps \longrightarrow lapse \rightarrow$

 $hovered \longrightarrow covered \rightarrow$

 $needed \longrightarrow kneaded \rightarrow$

Alegre & Gordon (1999)

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

representation and processing Nick Riches 1. Non-word roots A hybrid view

Proc vs Decl

05 - Morphological

A hybrid view Evidence for 2 sys.

Crit of DR model

(2) The role of frequency

Strong evidence for two systems

Novel inflected forms, e.g. meeked

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

05 - Morphological representation and processing

Nick Riches

1. Non-word roots

Evidence for 2 sys.

Evidence

Crit. of DR model

(2) The role of frequency

Strong evidence for two systems

processing \Leftrightarrow expressivity

05 - Morphological representation and processing

Nick Riches

1. Productive usage

1. Non-word roots

Evidence for 2 sys.

Evidence

Crit. of DR model

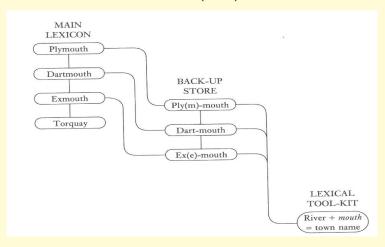
(1) Pseudo-regularity

(2) The role of frequency

5-minute exercise

Gradient phenomena

Aitchison, 'Words in the Mind' (2002)



05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Evidence for comp

- 1. Productive usa
- 2. Morph errors
- 3. Morpho-phon, parsing
- 4. Phonotactic evidence

Vhole-wd. stora

- 1. Non-word roots
- 2. Multiple meanings
- 3. Psycholinguistic evidence

A hybrid view Evidence for 2 sys.

Gradient phenomena

Dual Poute Mode

Dual Route Mode

The model
Evidence

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

minute exercise

Gradient phenomena

Chickenless nuggets \Rightarrow A careless person \Rightarrow A gormless/ruthless person



05 - Morphological representation and processing

Nick Riches

ntroduction

The big debate

Evidence for comp sys.

- 1. Productive us
- 2. Morph
- 3. Morpho-phon. parsir
 - 4. Phonotactic evidence

hole-wd. stora

- 1. Non-word roots
- 2. Multiple mean
- Psycholinguistic evider

A hybrid view Evidence for 2 sys.

Gradient phenomena

Dual Route Model

Proc. vs. Decl.

- Evidence Crit. of DR model
- (1) Desured assets
- (2) The role of frequency

minute exercise

05 - Morphological representation and processing Nick Riches

Morphology in language impairments - Ullman and Pinker's Dual Route model

1 Non-word roots

Evidence for 2 sys.

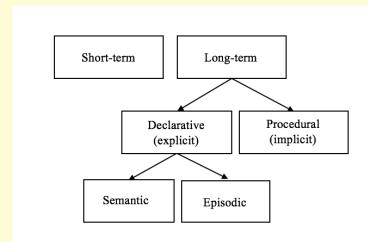
Dual Route Model

Crit of DR model

(2) The role of frequency

Procedural versus Declarative memory

Tulving's Memory model



05 - Morphological representation and processing

Nick Riches

Introduction

The big debate

Evidence for comp.

- 1. Productive usag
- 2. Morph errors
- 3. Morpho-phon. parsing

Vhole-wd. stora

- 1. Non-word roots
- 2. Multiple meanings
- Psycholinguistic evidence

A hybrid view
Evidence for 2 sys.

Dual Route Model

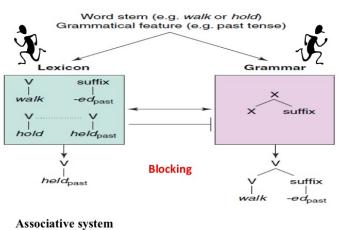
Proc. vs. Decl.

The mode Evidence

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

minute exercise

The model



Associative system
Analogy-based
Frequency dependent

Computational system Not frequency dependent 05 - Morphological representation and processing

Nick Riches

ntroduction

The big debate Comp. versus Lex.

Evidence for comp sys.

- Productive usa
- 2. Morph errors
- 3. Morpho-phon. parsing

Vhole-wd. storag

- 1. Non-word roots
- Multiple meanings
 Development of the second of th
- 3. Psycholinguistic evide

A hybrid view
Evidence for 2 sys.
Gradient phenomena

Dual Route Model

Proc. vs. Decl.

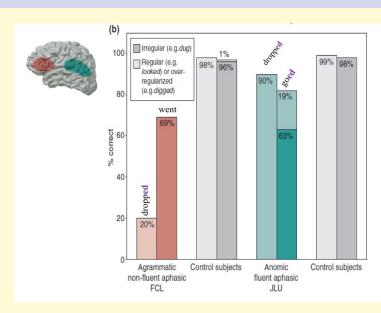
The model Evidence

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

minute exercise

....

The model



05 - Morphological representation and processing

Nick Riches

- 1. Non-word roots

A hybrid view Evidence for 2 sys.

Proc. vs. Decl. The model

Evidence

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

05 - Morphological representation and processing

Nick Riches

ntroduction

The big debate
Comp. versus Lex.

Evidence for comp sys.

- Productive usage
- 2. Morph errors
- 3. Morpho-phon. parsin

\/hala...d abaua

- Vhole-wd. stor
- Non-word roots
 Multiple meanings
- 2. Multiple meanings
- hybrid view

Evidence for 2 sys.

Gradient phenomer

Dual Route Mode

The model

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

inute exercise

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*?

05 - Morphological representation and processing

Nick Riches

1. Non-word roots

Evidence

Crit. of DR model

(1) Pseudo-regularity

(2) The role of frequency

05 - Morphological representation and processing

Nick Riches

1 Non-word roots

Evidence for 2 sys.

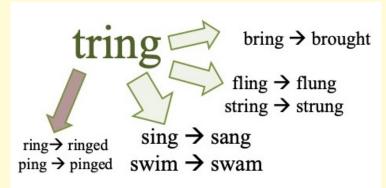
Evidence

Crit. of DR model

(2) The role of frequency

Analogy = the mapping of relationships

What is the past tense of *tring*?



05 - Morphological representation and processing

Nick Riches

1 Non-word roots

Evidence for 2 sys.

Evidence

Crit. of DR model

(2) The role of frequency

22 / 28

Procedural memory affected IRREG. >better than >REG.

Dev. Lang. Disorder **Parkinsons**

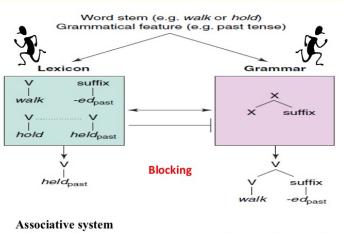
Broca's type aphasia

Declarative memory affected

REG. >better than >IRREG.

Alzheimmers

Wernicke's type aphasia



Analogy-based Frequency dependent

Computational system Not frequency dependent 05 - Morphological representation and processing

Nick Riches

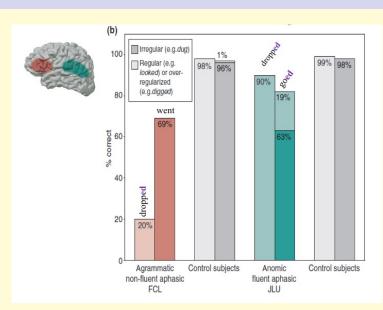
- 1 Non-word roots

Evidence for 2 sys.

Proc vs Decl

Evidence

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



05 - Morphological representation and processing

Nick Riches

ntroduction

The big debate

Evidence for comp sys.

- 1. Productive usa
- 2. Morph errors
- 3. Morpho-phon. parsin

Whole-wd. storag

- 1. Non-word roots
- 2. Multiple meanings
- Psycholinguistic eviden

A hybrid view

Evidence for 2 sys.

Gradient phenomena

Proc. vs. Decl.

Evidence

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

minute exercise

illitute exercise

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

Nick Riches

- 1 Non-word roots

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

Criticism of the dual route model

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

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

05 - Morphological representation and processing

Nick Riches

1 Non-word roots

Evidence for 2 sys.

Crit. of DR model

(2) The role of frequency

	representation and processing
Introduction	Nick Riches
	Introduction
The big debate	The big debate Comp. versus Lex.
Evidence for a computational system	Evidence for comp. sys.
Evidence of the whole-word storage of	Productive usage Morph errors
	Morpho-phon. parsing Phonotactic evidence
A budgid view	Whole-wd. storage 1. Non-word roots
	Multiple meanings Psycholinguistic evidence
Morphology in language impairments - Ullman and Pinker's	A hybrid view
Dual Route model	Evidence for 2 sys. Gradient phenomena
5-minute exercise	Dual Route Model
J-IIIIIute exercise	Proc. vs. Decl. The model
	Evidence

5-minute exercise 26 / 28

Crit. of DR model (1) Pseudo-regularity (2) The role of frequency

Bib

05 - Morphological representation and processing

Nick Riches

1 Non-word roots

Evidence for 2 sys.

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

5-minute exercise

27 / 28

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.
- Become powerful you have. The dark I sense in you side.

05 - Morphological representation and processing Nick Riches 1. Non-word roots Evidence for 2 sys.

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Crit of DR model

Proc vs Decl

Rih

(2) The role of frequency

05 - Morphological representation and processing

Nick Riches

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- 1. Productive usage

1 Non-word roots

Evidence for 2 sys.

Proc vs Decl

Crit. of DR model

Rib

(2) The role of frequency