Skilled readers' sensitivity to meaningful regularities in English writing

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English writing

/-əs/

FAMOUS, SOLACE, ATLAS, CYPRESS,

BONUS, TORTOISE, RHINOCEROS

We know a lot about spelling-to-sound mappings.

Spelling-to-meaning?

English writing

/-əs/

FA LOUS

Adjectives

Verbs

ATLAS, CYPRESS, TORTOISE

Nouns

Outline of this talk

A computational study

- Study 1: Systematicity between spelling and lexical category

  Q: How to quantify it?

  Q: Is it common?

Experimental studies

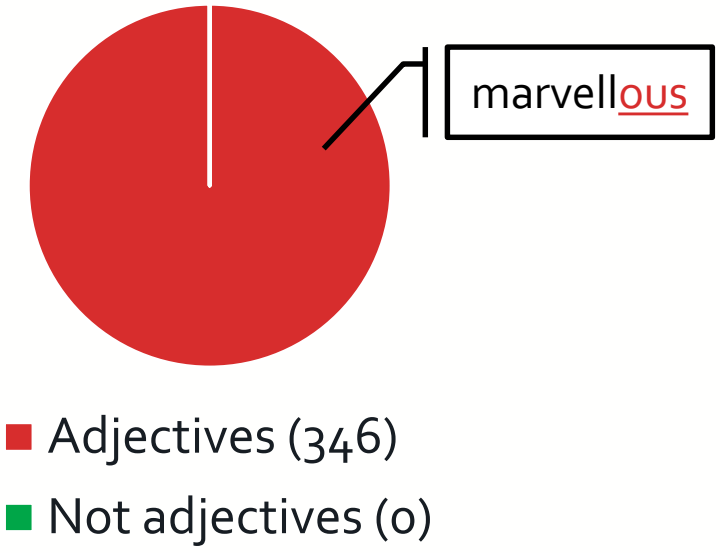
- Study 2: Eye-tracking
- Study 3: Spelling

  Q: Are people sensitive to this systematicity?

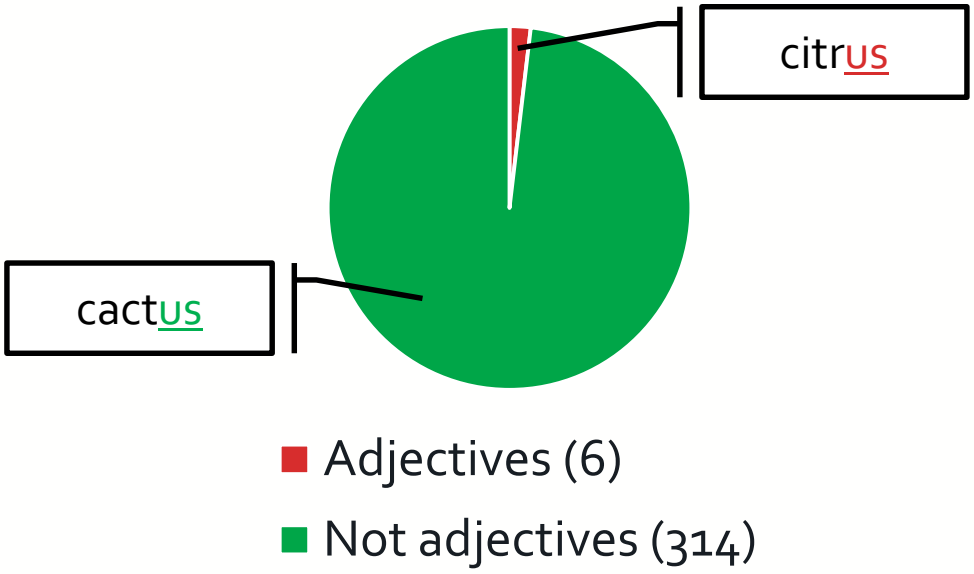
Regularity between spelling and lexical category

-/əs/

OUS spelling



Other spelling



Berg & Aronoff (2017)

Regularity between spelling and lexical category

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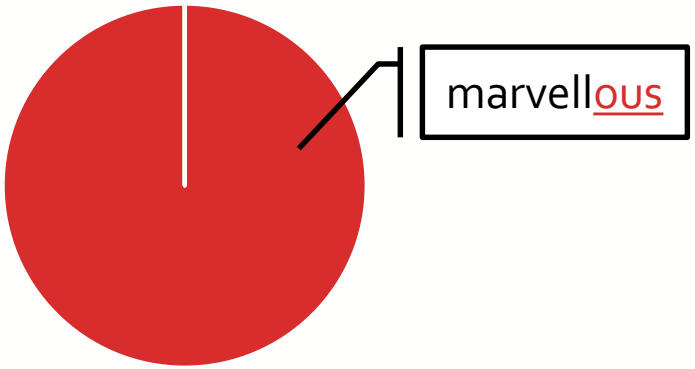
-/əs/

OUS spelling



- Adjectives (314)
- Not adjectives (0)

- Spelling → meaning
- "OUS" is diagnostic of the adjective category

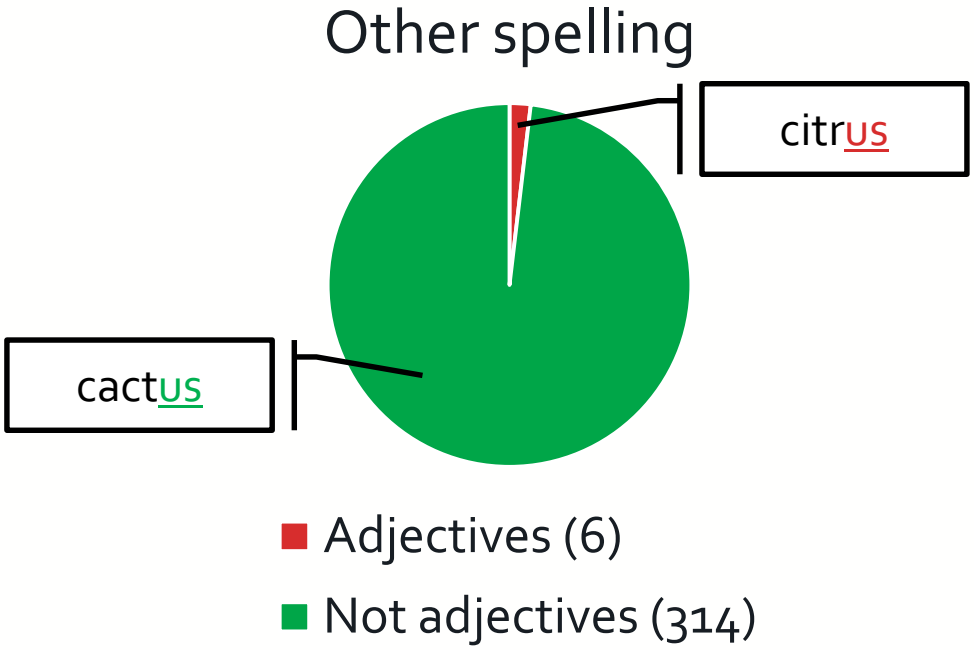
Diagnosticity

Regularity between spelling and lexical category

-/əs/

- Meaning → spelling
- "OUS" is specific for the adjective category

Specificity



Study 1: Large-scale linguistic analysis

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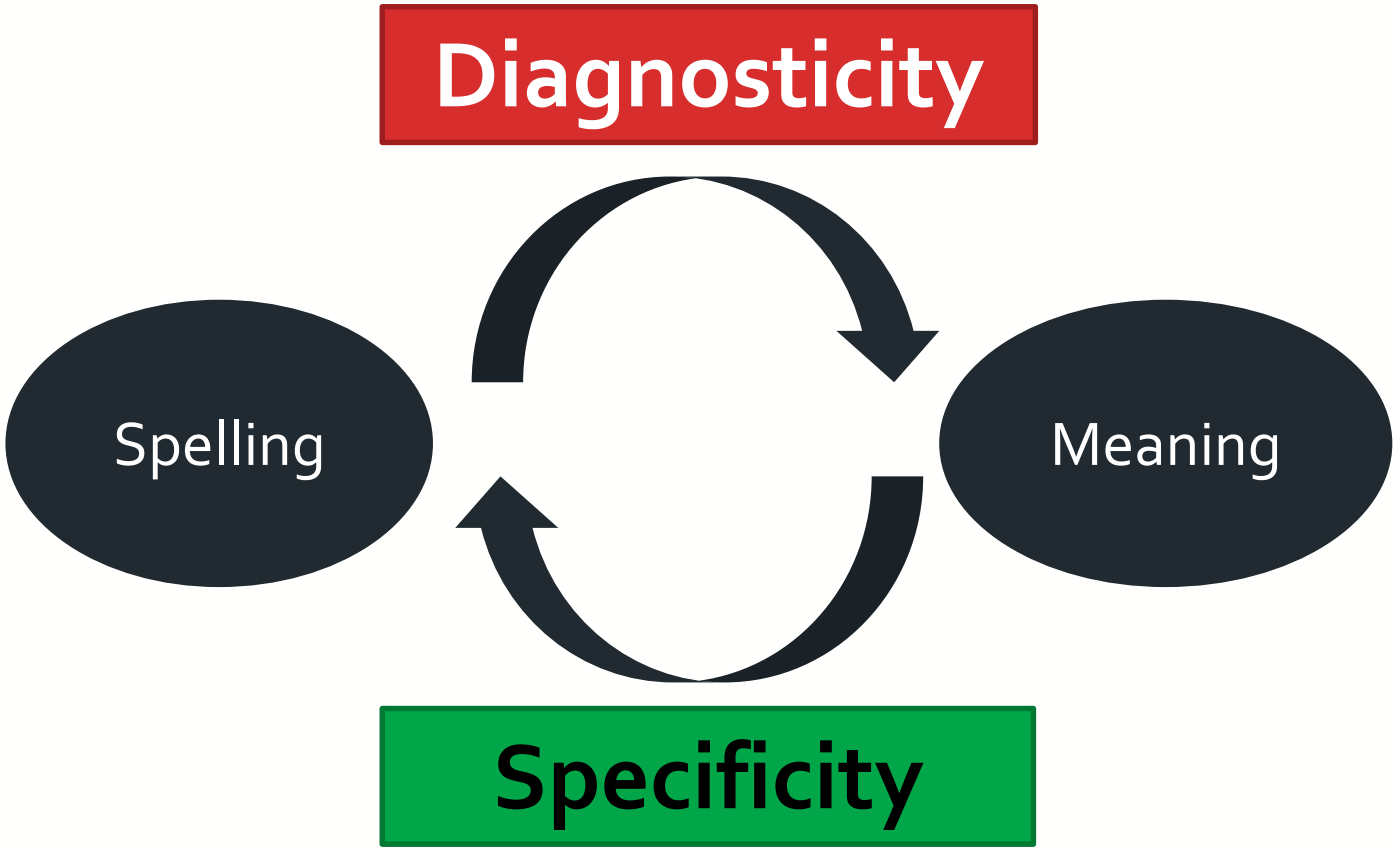
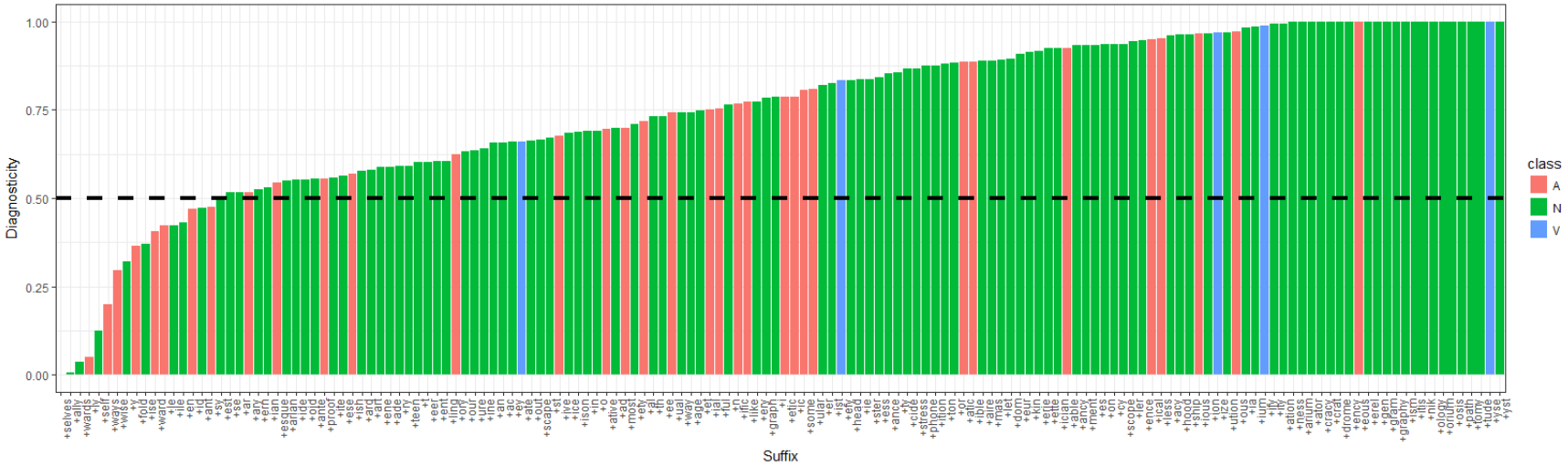
- Question: Is systematicity between spelling and category true of English derivation in general?
- Idea: Spelling disambiguates lexical category
  - 159 suffixes
  - Is there a dependency between spelling and category?



+IE -> noun (diagnostic)

+EE, +Y, +I etc. (not specific)

Diagnosticity

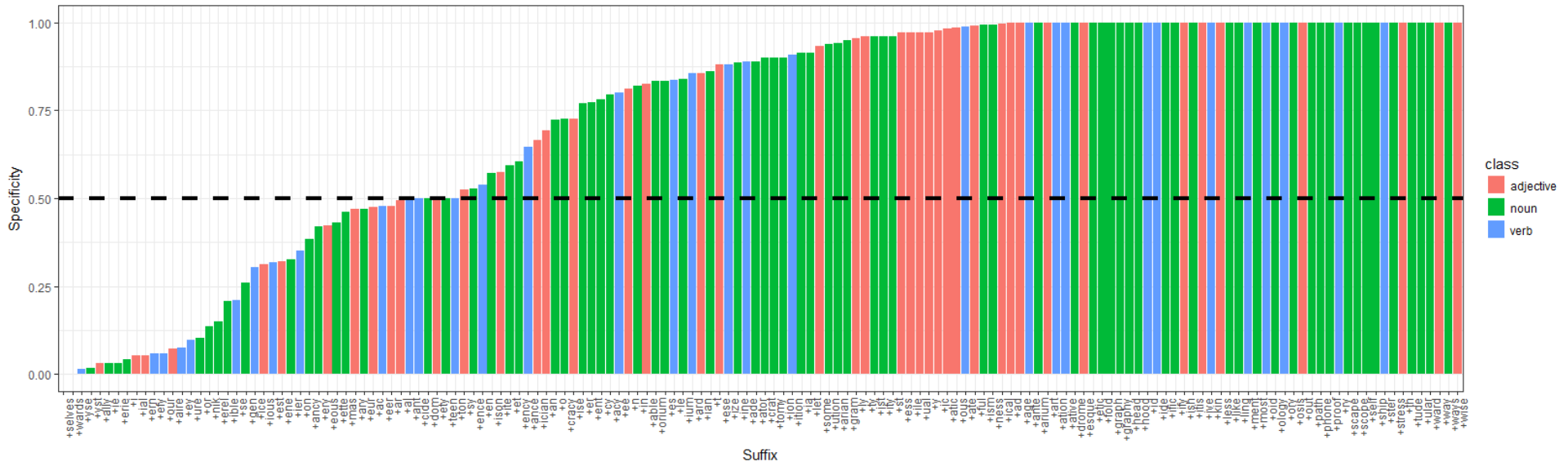


Can one tell the category by looking at the spelling?

$$D = \frac{words_{class}}{words}$$

Mean diagnosticity is 0.78

Specificity



Can one predict the spelling when the category is known?

$$S = \frac{words_{class+spelling}}{words_{class}}$$

Mean specificity is 0.82

Outline of this talk

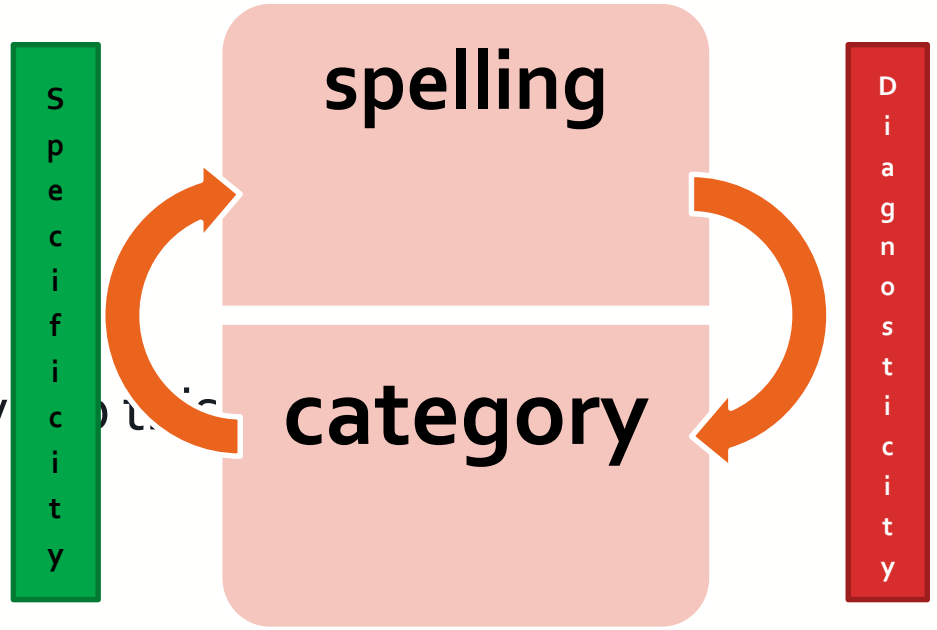
A computational study

- Study 1: Systematicity between spelling and lexical category
  - Diagnosticity and specificity

Experimental studies

- Study 2: Eye-tracking
- Study 3: Spelling

Q: Are people sensitiv[illegible] t[illegible]



Study 2: Eye-tracking – Design

- "Suffixed" nonwords (JIXLET, TOBNESS)
- 40 noun, 40 adjective, 40 verb biasing contexts
- 47 participants
- Does incongruency between spelling and meaning cause difficulties in reading?

Example:

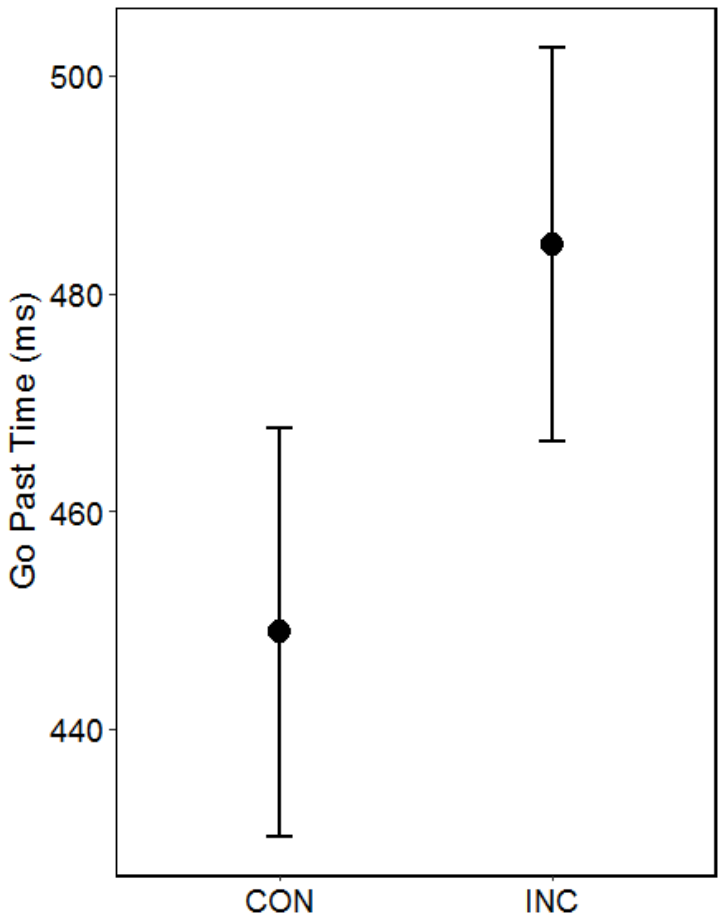
- The presentation recognised the impressive tobness of the protestors
- The mourners began to sadly tobness as the coffin disappeared

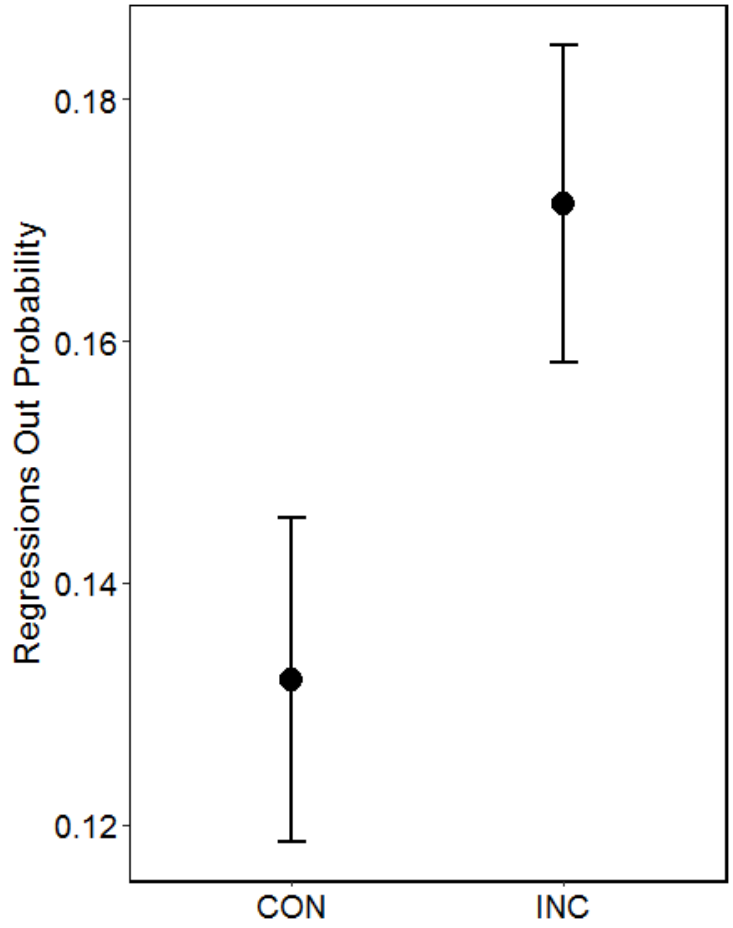
Study 2: Eye-tracking – Design

- 47 participants

Regressions

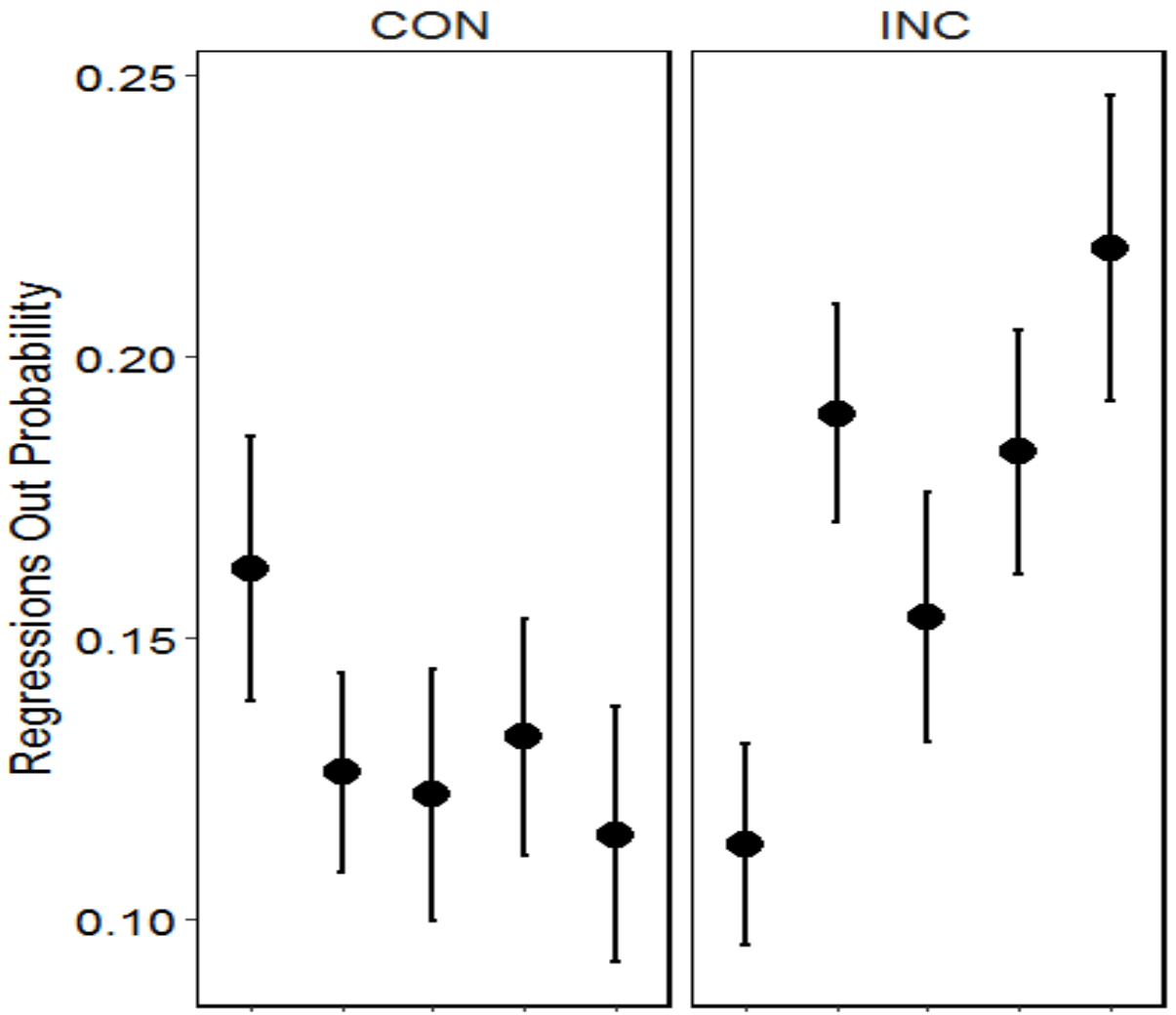
Study 4: Eye-tracking – Results





Incongruency with context causes integration difficulties

Greater integration difficulty for suffixes that strongly predict class



B = -0.19, z = -2.56, p < 0.05 Higher diagnosticity B = 0.35, z = 2.3, p < 0.05

Outline of this talk

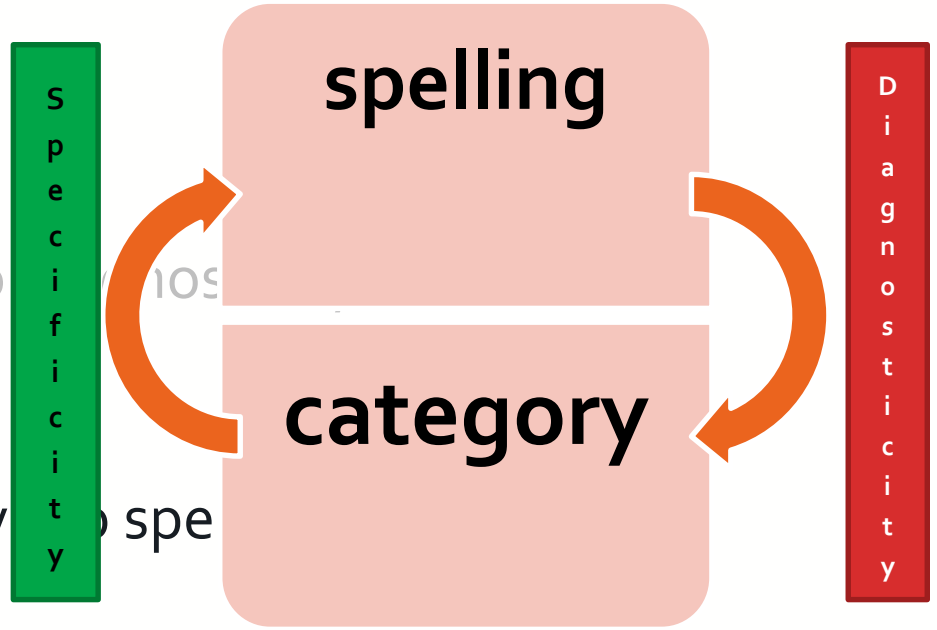
A computational study

- Study 1: Systematicity between spelling and lexical category
  - Diagnosticity and specificity

Experimental studies

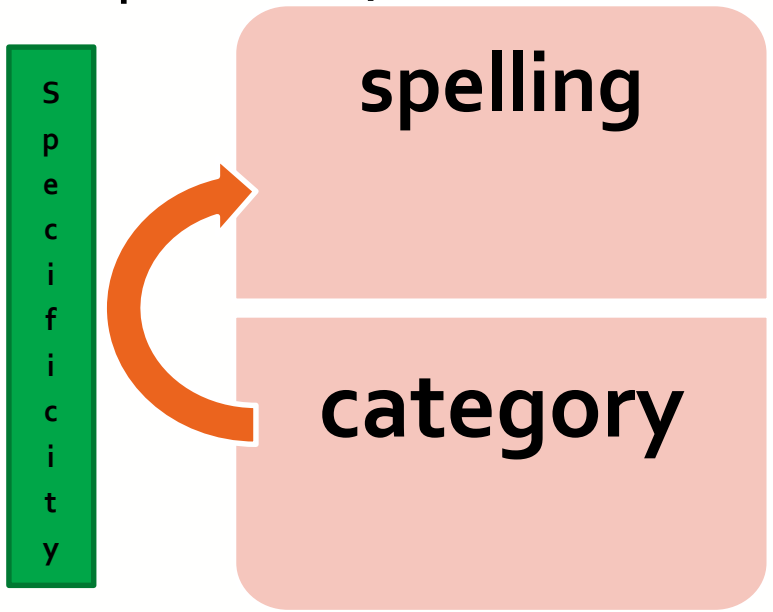
- Study 2: Eye-tracking
  - People are sensitive to
- Study 3: Spelling

  Q: Are people sensitiv spe



Study 3: Spelling study

- Q: Are people sensitive to specificity?



- Idea:
  - Nonwords are placed into different sentence frames
  - Does context influence people's spellings?

Study 3: Spelling study – Design

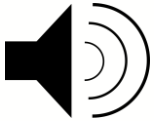
- 11 phonological endings that can be spelled differently
- Joined them with CVC non-existing stems
- 66 nonword recordings
- Biasing sentence contexts
- One recording used in both contexts

[sedʒnɪs]

Can you spell this?

Study 3: Spelling study – Design

- 29 participants



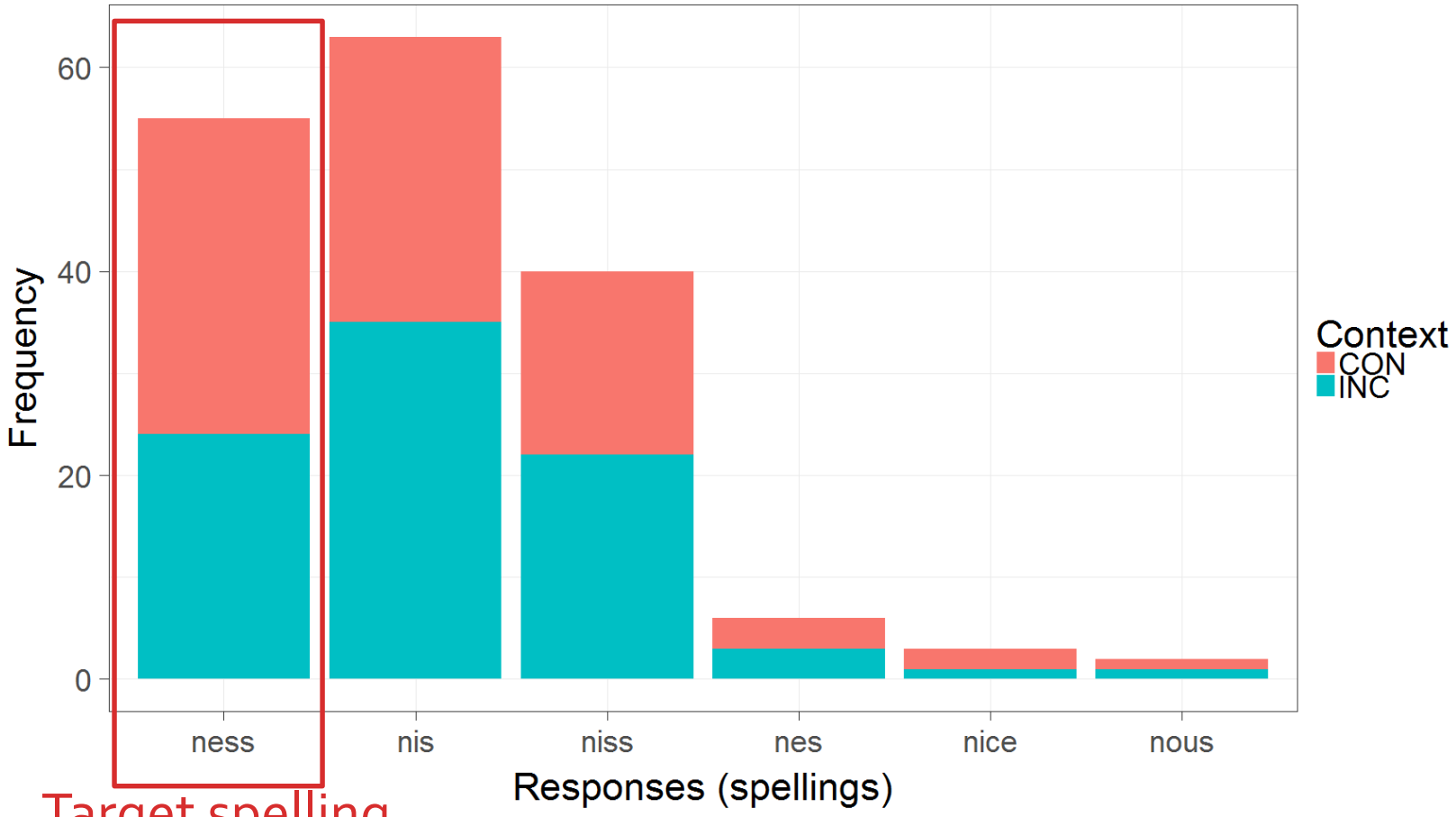
[sedʒnɪs]

Example:

- The presentation recognised the impressive …… of the protestors **sedgeness**
- The mourners began to sadly ……. as the coffin disappeared **sedgenis**

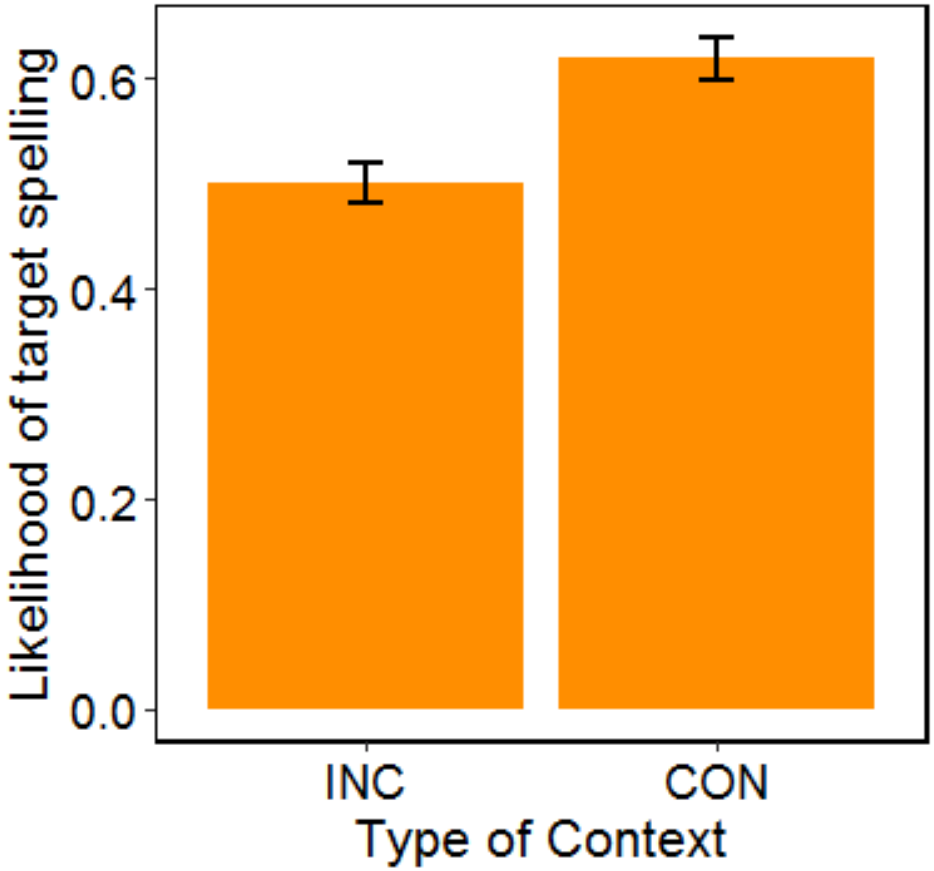
Study 3: Spelling study – Results

- Variety of spellings



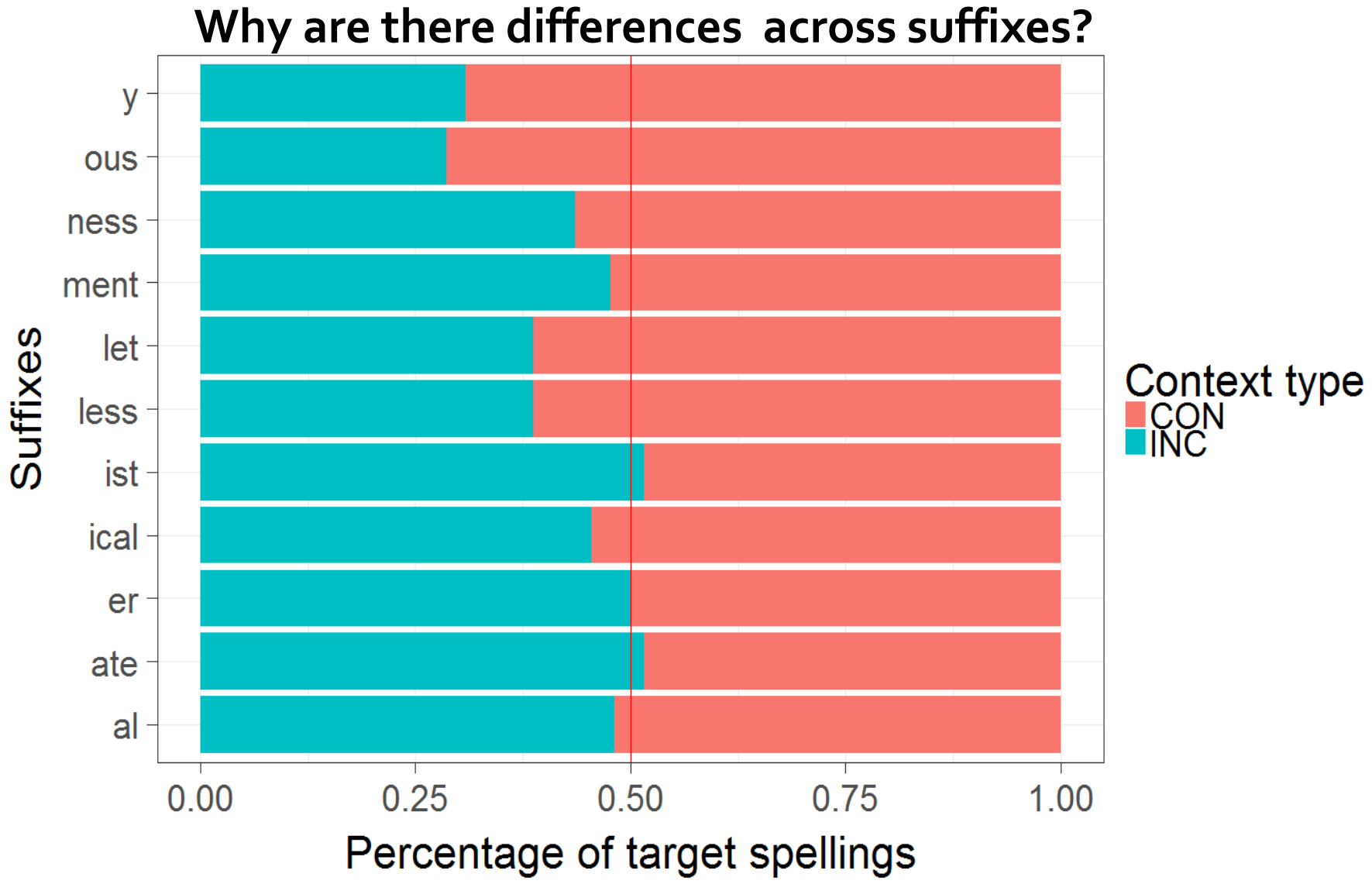
Study 3: Spelling study – Results

People exploit their knowledge of category-spelling regularities to indicate lexical category



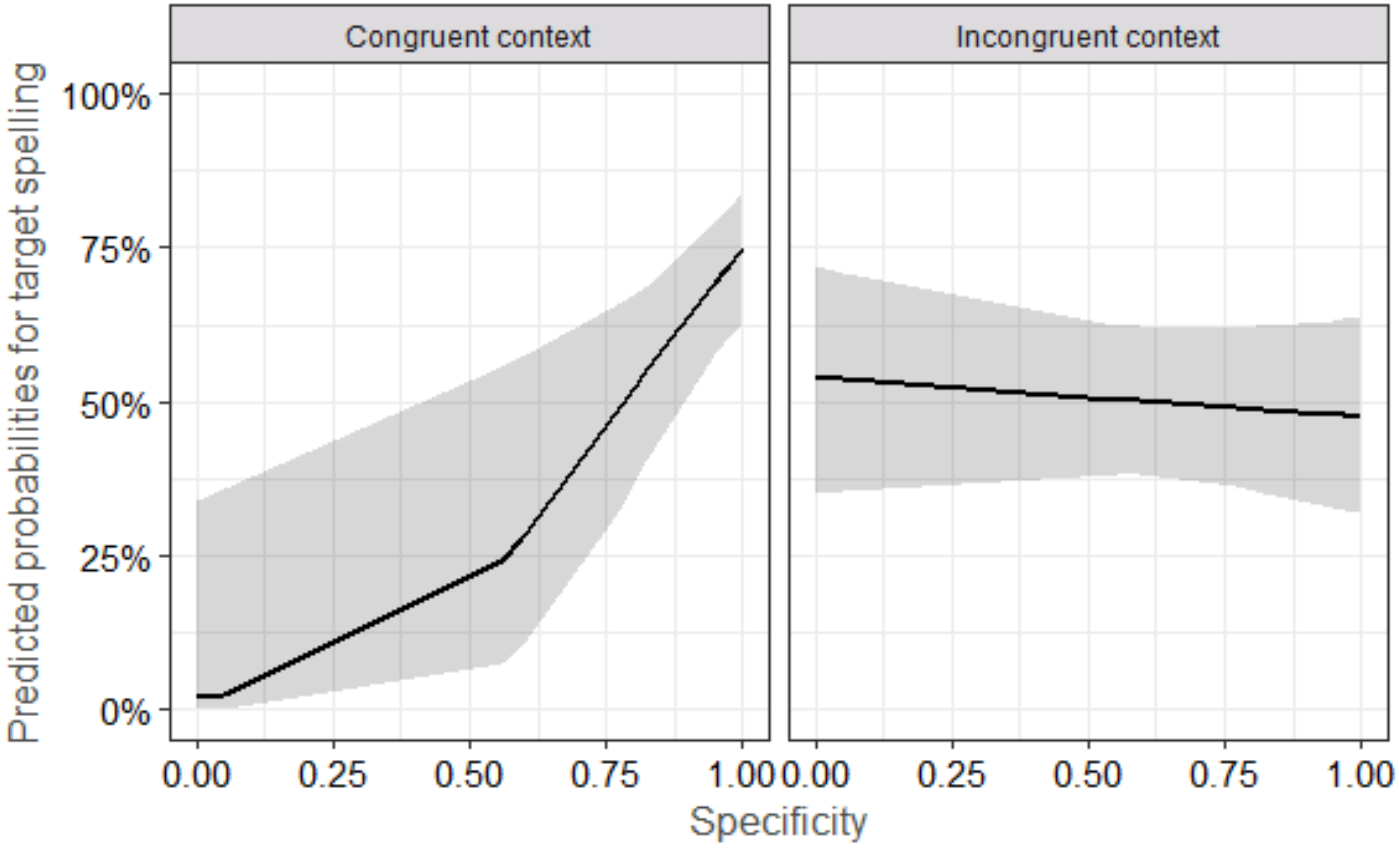
$z = 4.84$, $p < 0.0001$

Study 3: Spelling study – Results



Study 3: Spelling study – Results

Strongest effects on spelling are found for suffixes that disambiguate category



Conclusions

- Regularities between spelling and lexical category are ubiquitous
  - Diagnosticity
  - Specificity
- Writing indicates meaning (phonology does not)
- People are sensitive to these regularities
- Degree of sensitivity mirrors the statistics of the writing system

Thank you for your attention!

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