In search of meaning: Semantic effects on past-tense inflection

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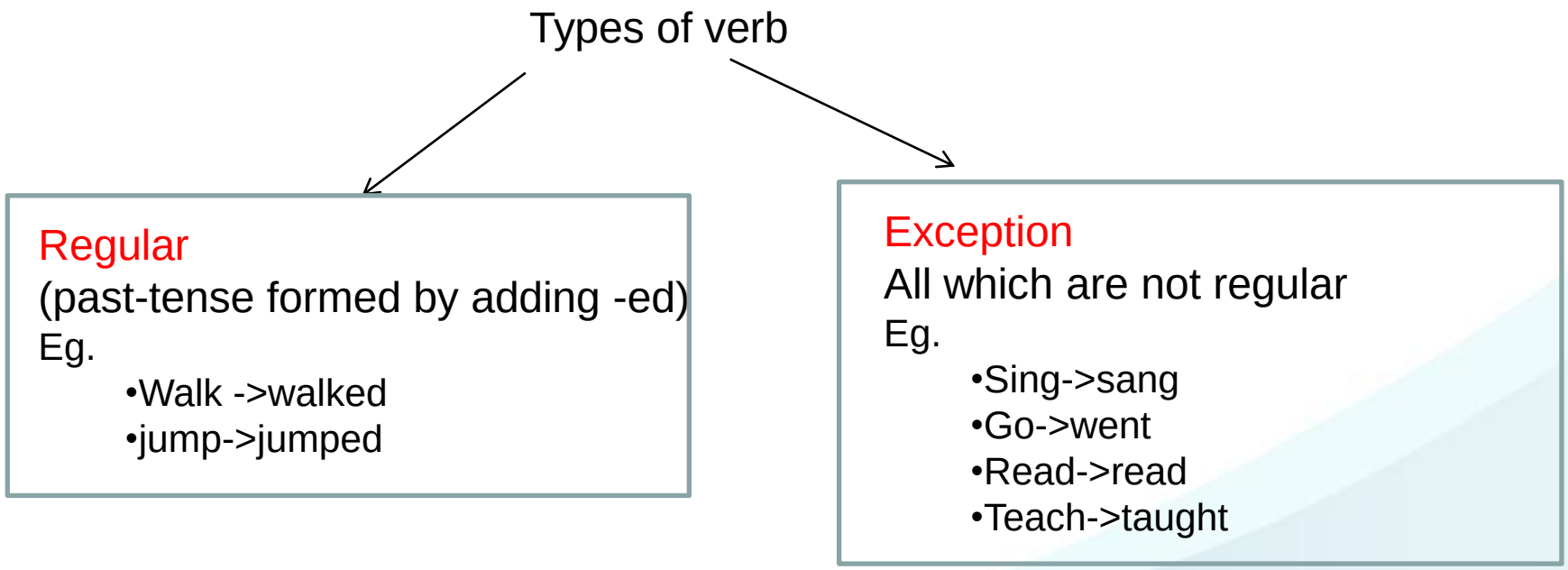
Basics

- Past-tense inflection (or simply inflection)
  - Given present-tense verb, convert it to its past-form
    - Eg. Sit -> sat, walk -> walked



➢ In English, 86% verbs are regular

Known cognitive behaviors

- It takes more time to inflect exception verb than regular verb.
- Parkinson disease (damage of frontal lobe) impairs ability for regular verb inflection but exception verb inflection.

How does human mind inflect?

- Model that could explain how both regular and exception verb are processed by mind to come up with past-tense.
- Two contrasting models
  - Dual-mechanism “word-and-rules”
  - Single mechanism connectionist model

Dual-mechanism model

- Regular verbs are inflected by rule (add -ed)
  - Procedural, in frontal lobe
- Exception verb inflections are stored in lexicon (dictionary).
  - Imperative, in temporal lobe

- The rule is applied by default but if stored inflected form of verb is retrieved, rule application is blocked.

Single mechanism connectionist model

- No distinct subsystems for regular and exception verbs
- Present-tense mapped to past-tense via system of distributed phonological and semantic representation.
- Suggests that phonology primarily impacts regular verb inflection and semantics impacts exception verb inflection.

Experiment

- Aim: To show semantics impacts exception verb inflection more than regular verb inflection

- Imageability: property of a word to be visually imagined.

- Drink – more imageability
- Deal – less imageability

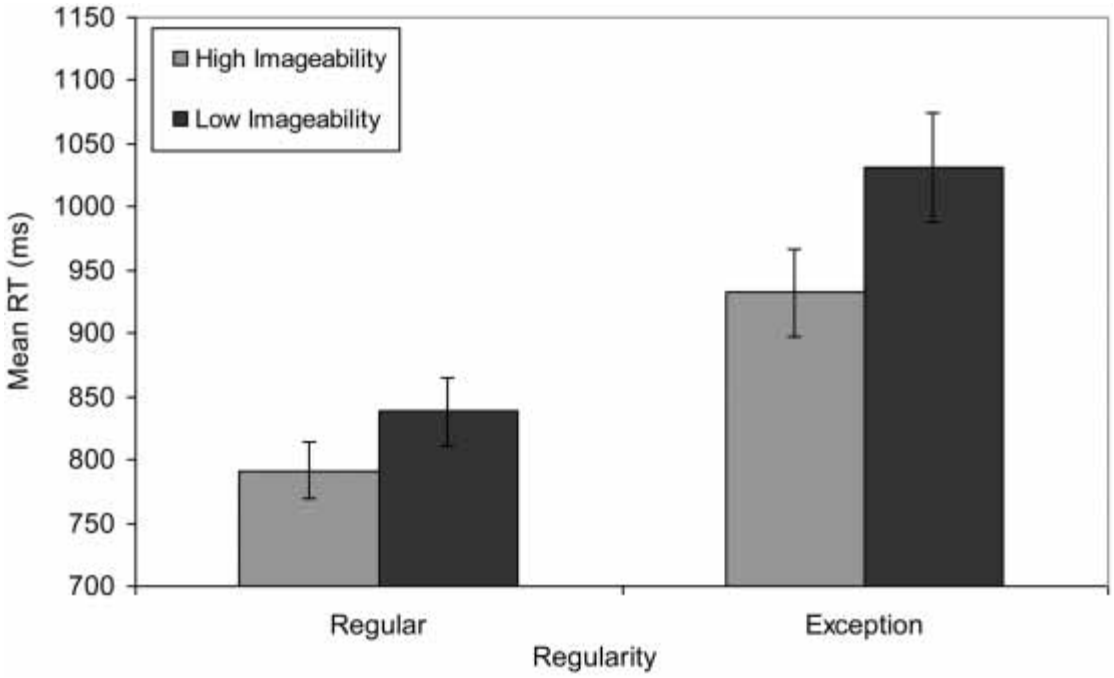


Figure: Mean reaction times (RTs) as a function of regularity and imageability

Thank You