

# Distributional Interaction of Concreteness and Abstractness in Verb–Noun Subcategorisation

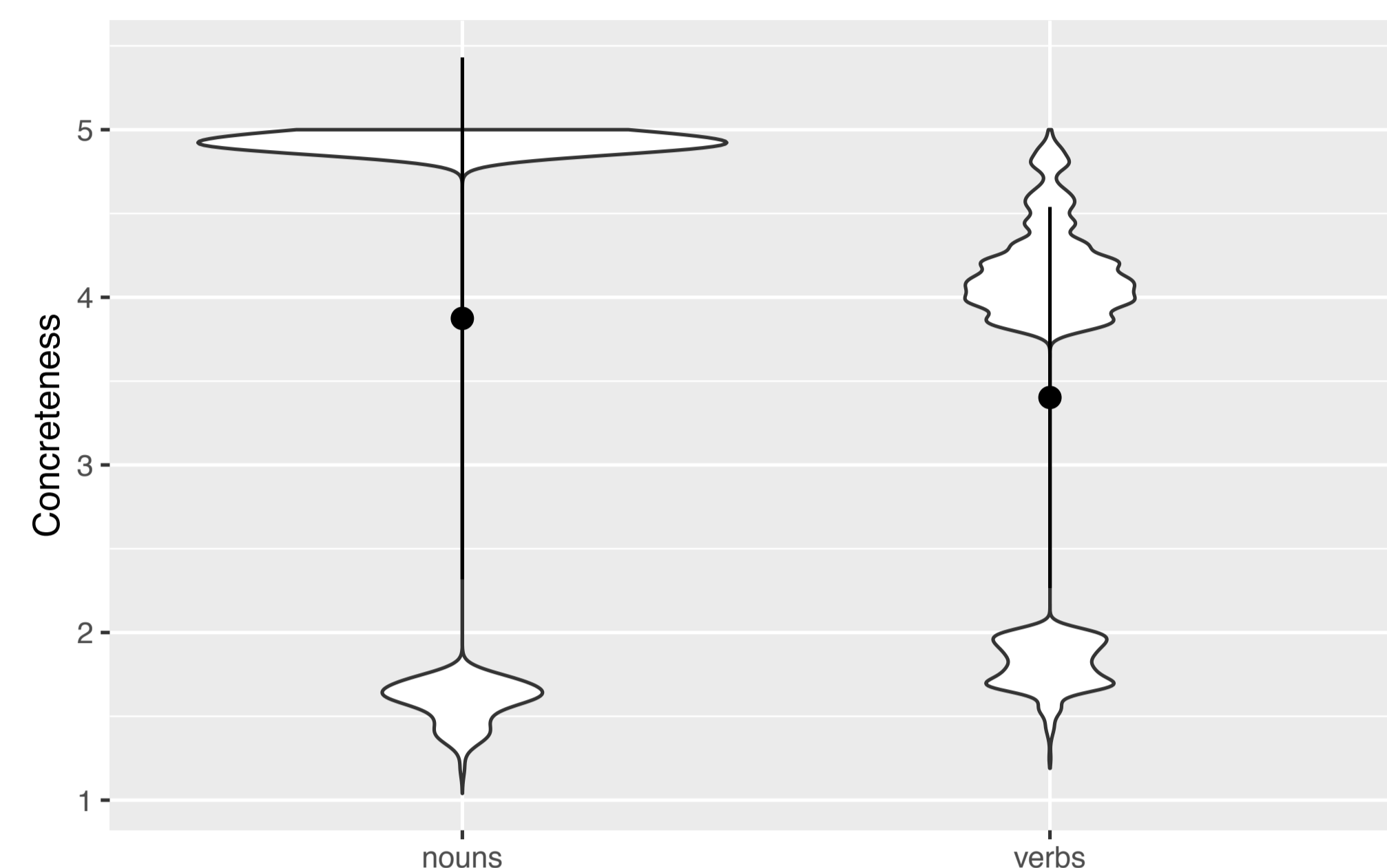
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## Aims

- Fine-grained investigation of concreteness in **verb-noun subcategorisation**
- Comparison of **computational evidence** and **cognitive evidence**
- **Zoom in** on concreteness scores of **verbs** and **nouns subcategorised as**:
  - Subjects
  - Direct Objects
  - Prepositional Objects



## Nouns vs. Verbs

**Nouns:**  $3.9 \pm 1.6$   
 belief<sub>1.2</sub> vs. ball<sub>5.0</sub>  
**Verbs:**  $3.4 \pm 1.1$   
 moralise<sub>1.4</sub> vs. sit<sub>4.8</sub>

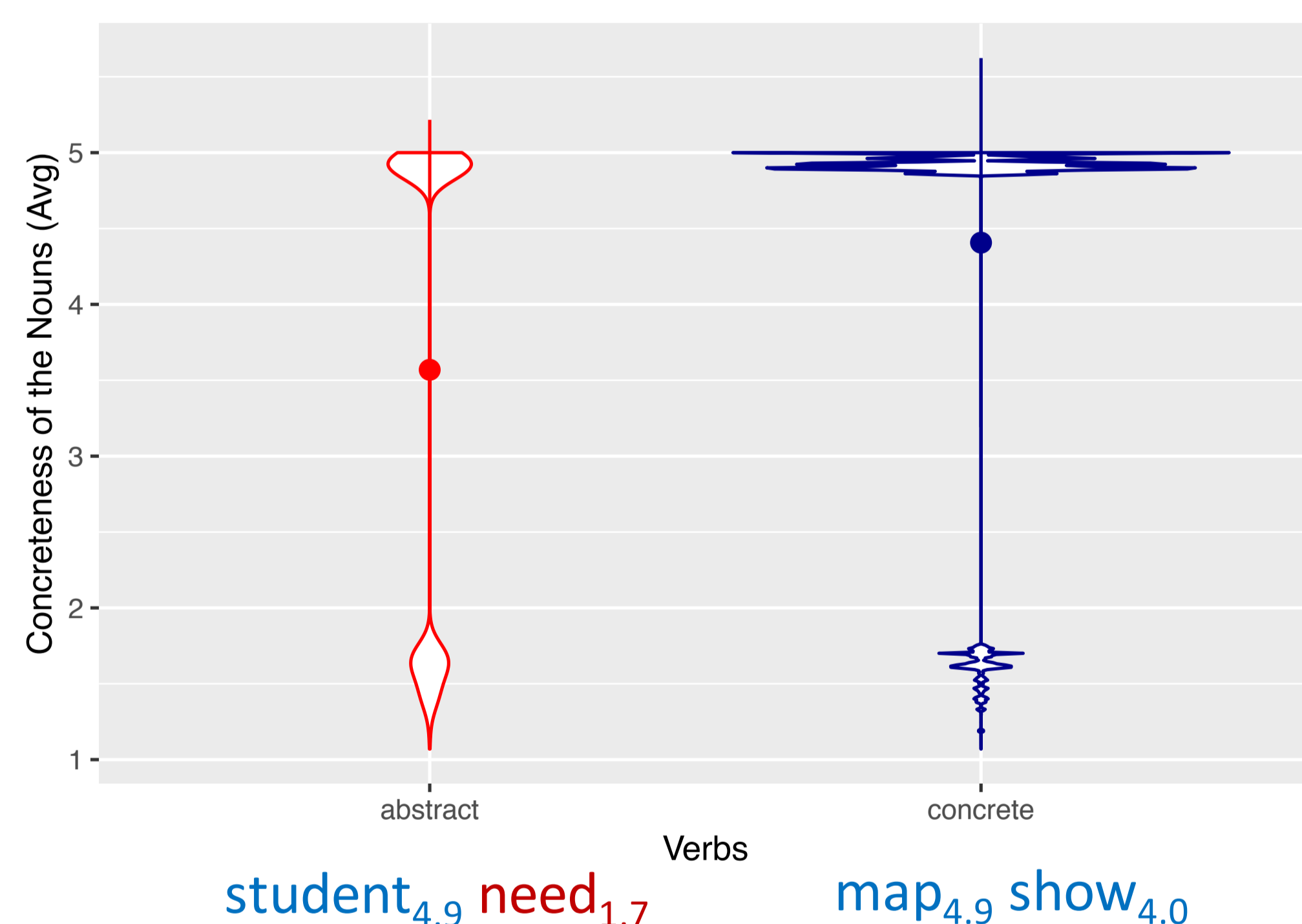
## Concrete vs. Abstract Words

- Previous computational results:
  - **Concrete words** co-occur mainly with **concrete contexts**
  - **Abstract words** co-occur mainly with **abstract contexts**
- Not fully in line with Embodied Theories of Cognition (Barsalou, 1999):
  - ✓ **Concrete Words**
  - ✗ **Abstract Words**

## Materials

- **Human** concreteness scores (Brysbaert et al., 2014) (1=abstract - 5=concrete)
- 1000 most **concrete** and 1000 most **abstract nouns**
- 500 most **concrete** and 500 most **abstract verbs**
- **Corpus:** parsed version of the ENCOW16AX (9,5B words)
- 11,7M verb-noun token pairs (3.8M abstract verbs, 7.9M concrete verbs)

## Subjects (active clauses)



**Concrete:**  $4.4 \pm 1.2$   
**Abstract:**  $3.6 \pm 1.7$   
 Overall:  $4.1 \pm 1.5$   
 Conc – Abst: 0.84

## Prepositional Objects

### 1. Concrete Verbs and Nouns (e.g., "in")

- write<sub>4.2</sub> in book<sub>4.9</sub>
- sleep<sub>4.4</sub> in bed<sub>5.0</sub>

**Exceptions: idiomatic structures**

- carry<sub>4.0</sub> in accordance<sub>1.5</sub>
- carry<sub>4.0</sub> in manner<sub>1.6</sub>

### 2. Abstract Verbs and Nouns (e.g., "for")

- need<sub>1.7</sub> for purpose<sub>1.5</sub>
- imagine<sub>1.5</sub> for moment<sub>1.6</sub>

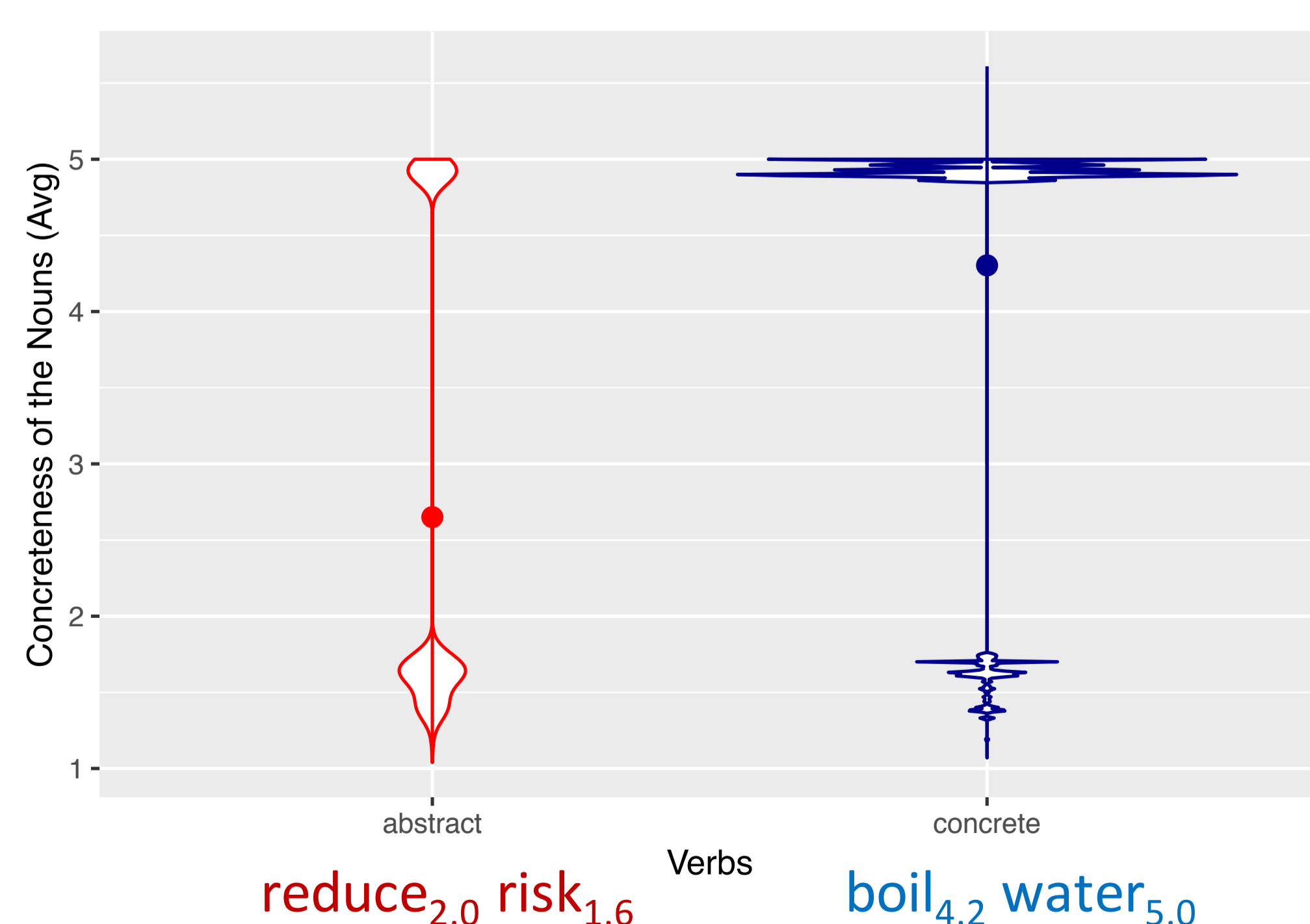
**Exceptions: metonymic reading**

- write<sub>4.2</sub> for magazine<sub>5.0</sub>
- run<sub>4.3</sub> for office<sub>4.9</sub>

### 3. Concrete and Abstract Verbs and Nouns (e.g., "on")

- sit<sub>4.8</sub> on bench<sub>4.9</sub>
- base<sub>3.9</sub> on expectation<sub>1.6</sub>
- depend<sub>1.9</sub> on extent<sub>1.4</sub>

## Direct Objects



**Concrete:**  $4.3 \pm 1.3$   
**Abstract:**  $2.7 \pm 1.6$   
 Overall:  $3.8 \pm 1.6$   
 Conc – Abst: 1.65

### Exceptions:

**Metaphors:** concrete verbs + abstract direct objects  
 (carry<sub>4.0</sub> risk<sub>1.6</sub> vs. carry<sub>4.0</sub> bag<sub>4.9</sub>)

**Metonyms:** abstract verbs + concrete direct objects  
 (recommend<sub>1.7</sub> book<sub>4.9</sub> vs. write<sub>4.2</sub> book<sub>4.9</sub>)

## Take Home Message

- **Concrete verbs** predominantly subcategorise **concrete nouns** as subjects and direct objects
- **Abstract verbs** predominantly subcategorise **abstract nouns** as subjects and direct objects
- 3 main patterns for prepositions: **main concrete**, **main abstract**, mixed
- **Exceptions** → semantic effects in verb-noun interaction: **collocations, metaphors and metonyms**