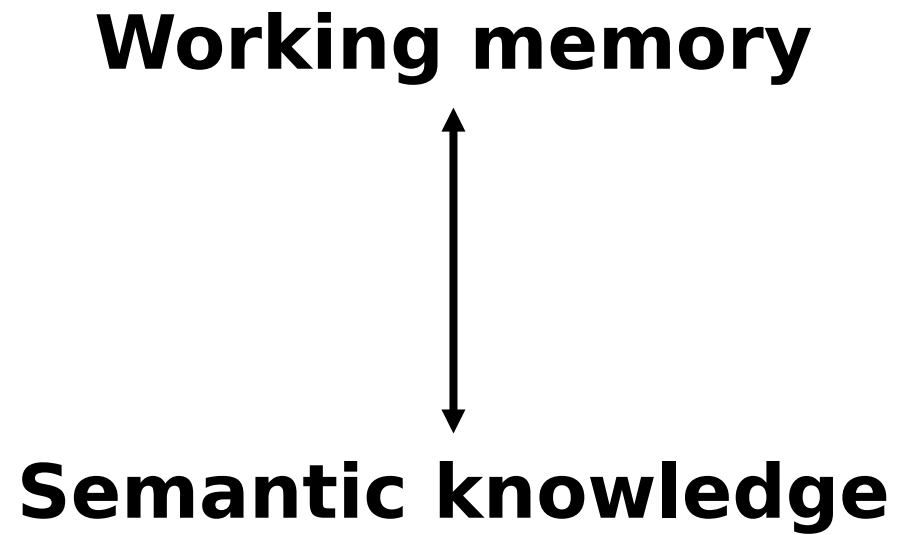


A Working Memory Model Integrating Meaning

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Zurich^{UZH}**



Introduction

Serial recall procedure

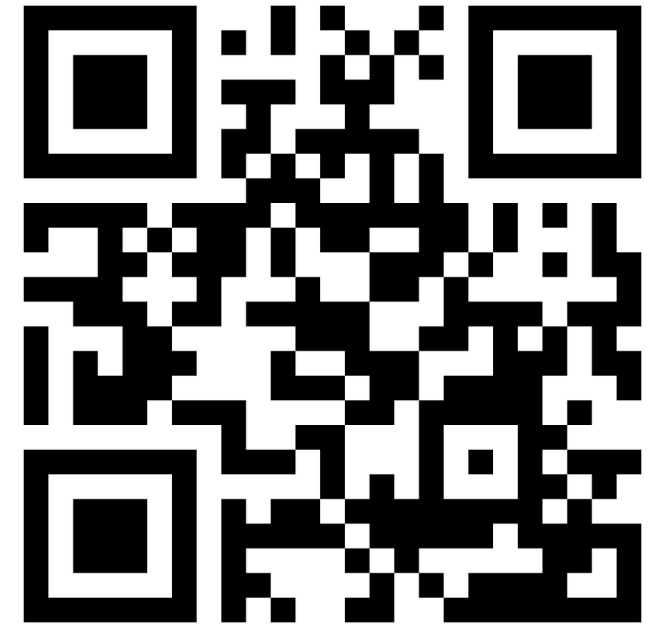
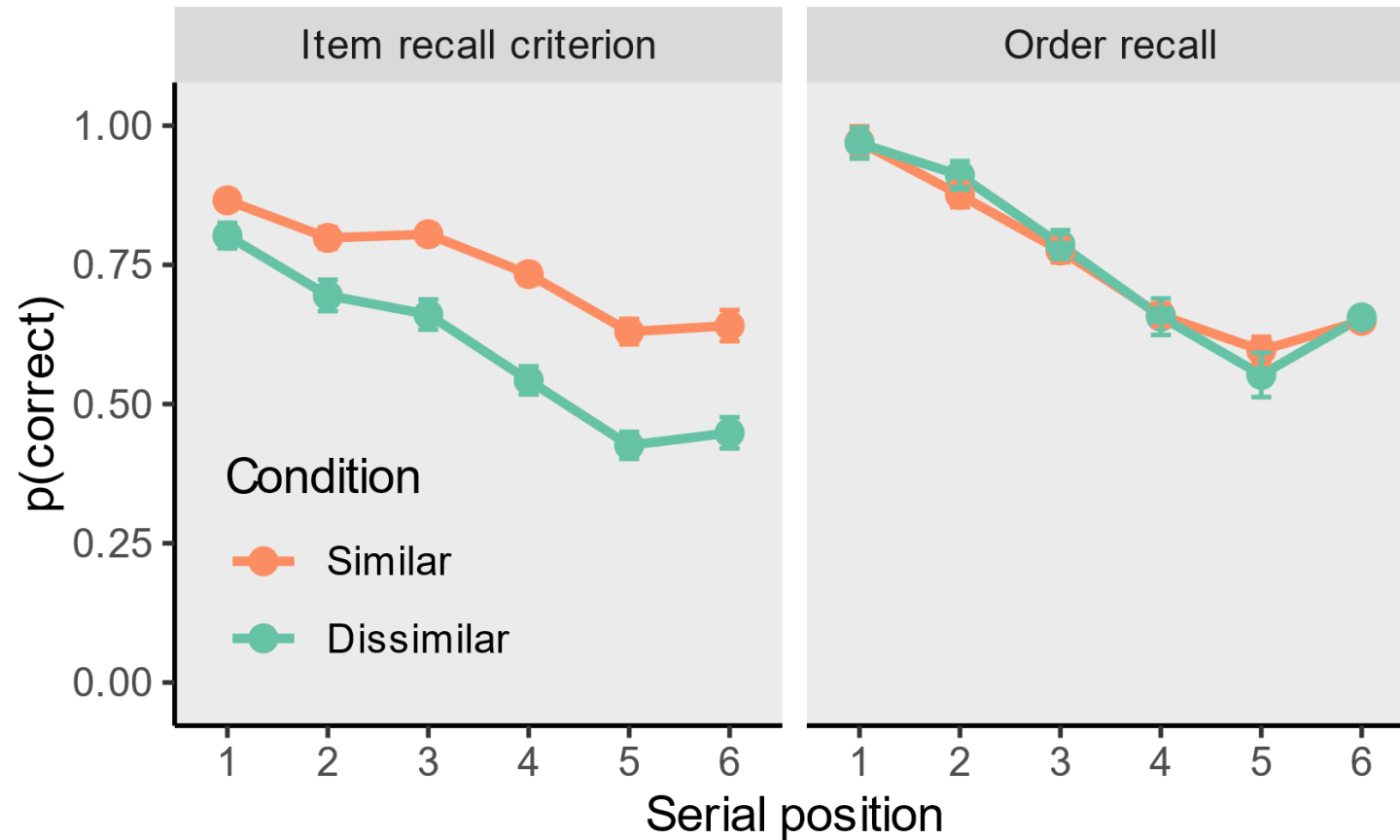
Semantic similarity

Mars, Pluto, Earth, Venus, Saturn, Jupiter
tree, guitar, puma, laptop, banana, glove



irier & Saint-Aubin (1995) *QJEP*

Introduction



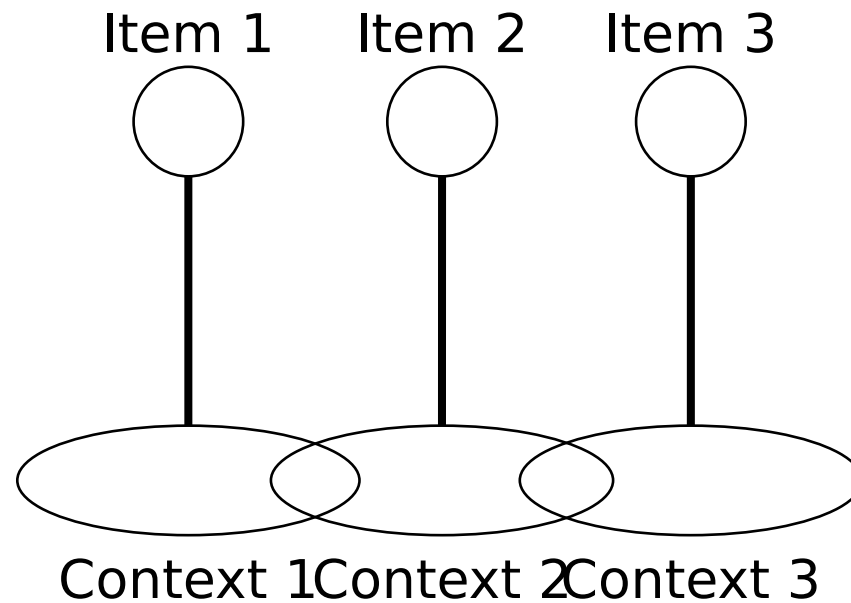
Preprint on OSF

Implications: Working memory interacts with semantic knowledge.

Question: What is the nature of these interactions?

How do we encode information into WM?

Architecture



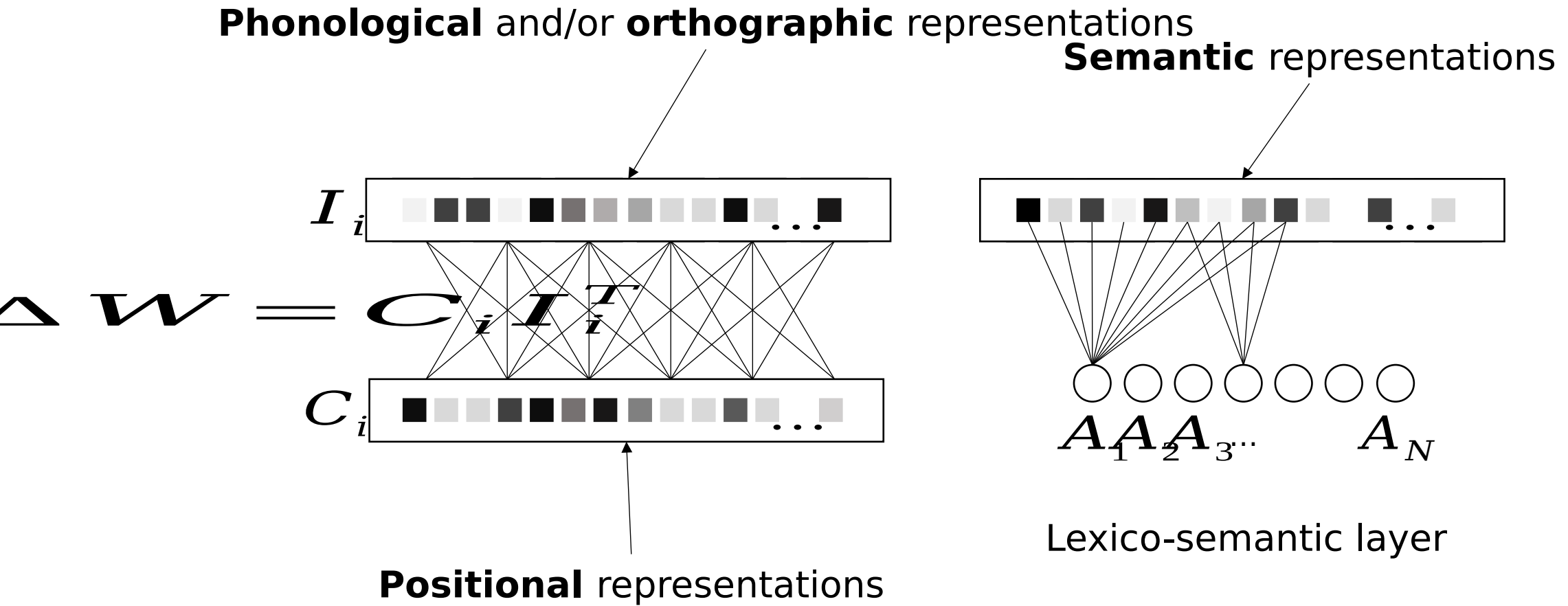
J. J. Burgess & Hitch (1999) *Psych Review*

J. J. Burgess & Lewandowsky (2004) *JML*

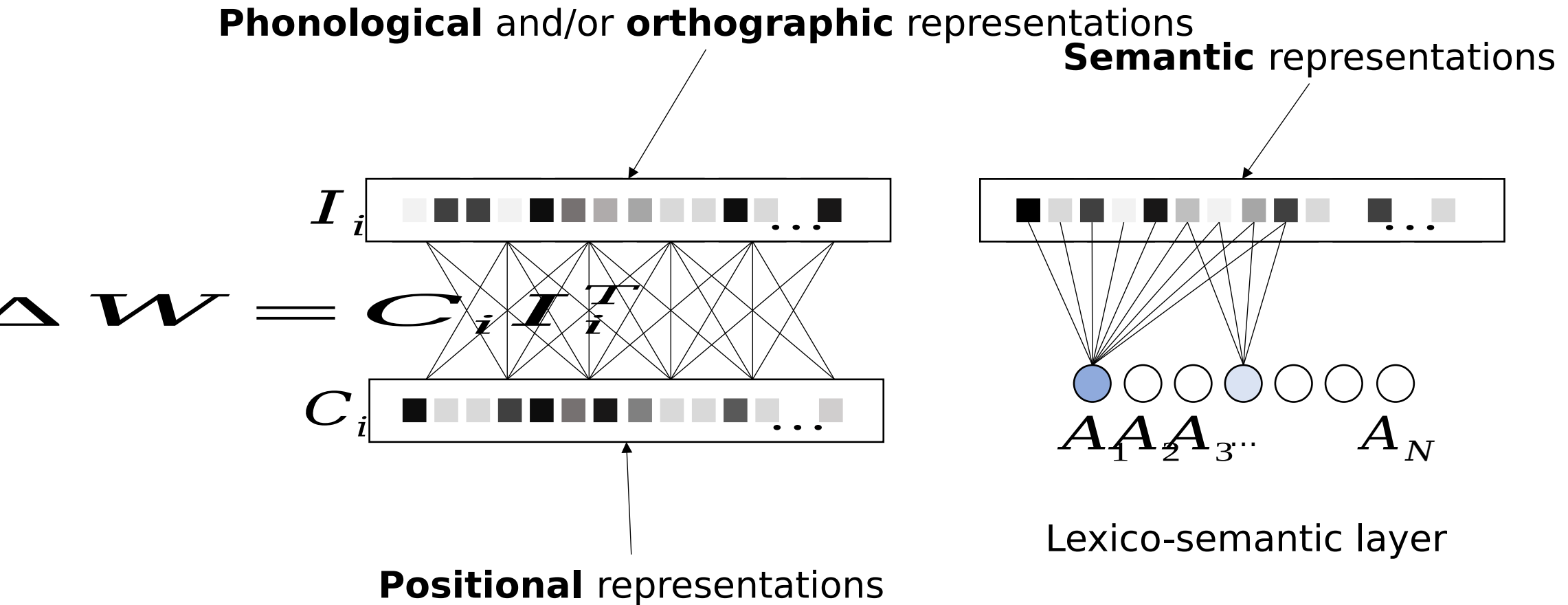
J. J. Burgess et al. (2012) *PB&R*

J. J. Burgess (1998) *Cog Psych*

Architecture



Architecture

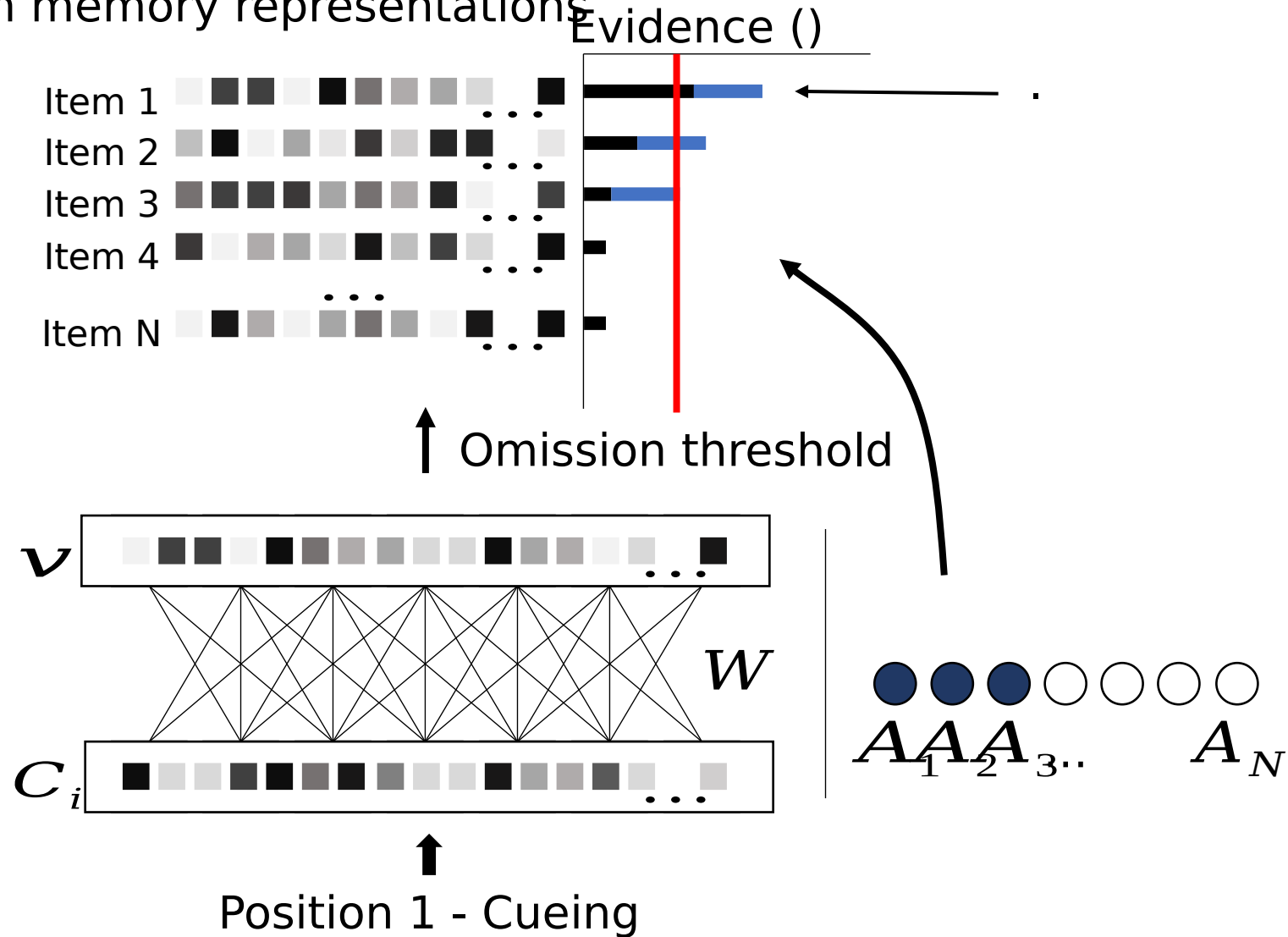


Consequence:

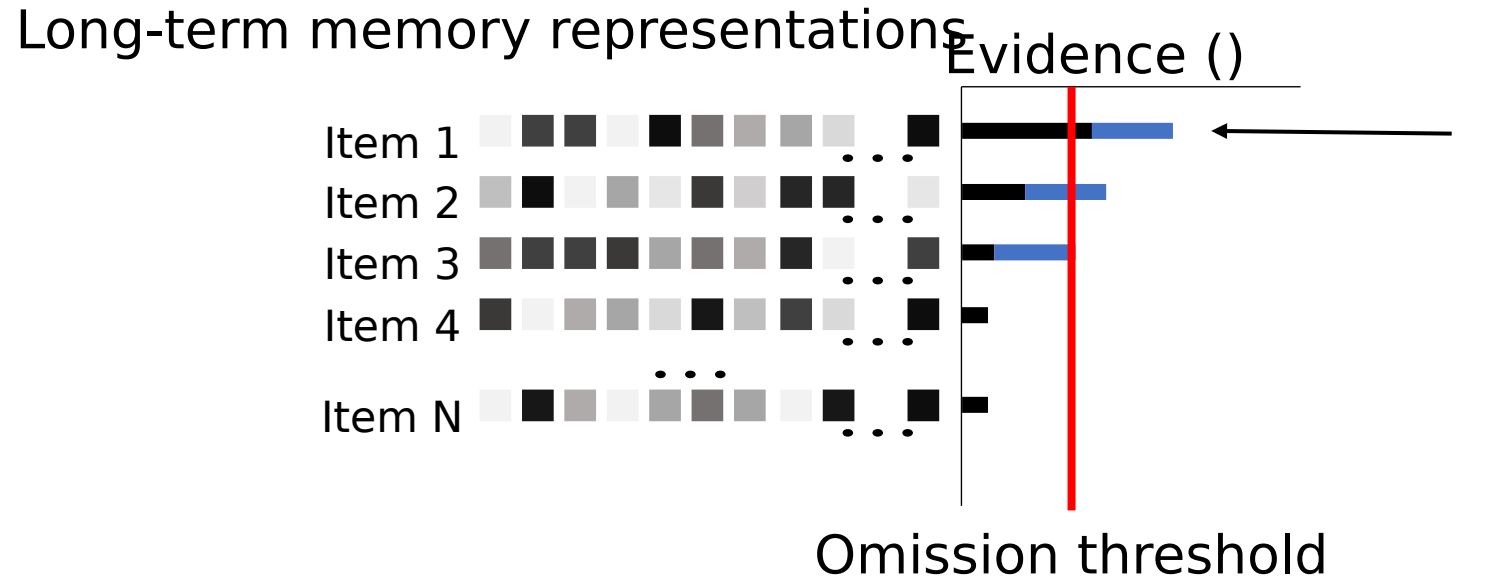
Semantically similar items receive stronger activation in the lexico-semantic layer than semantically dissimilar items do.

Architecture

Long-term memory representations



Architecture

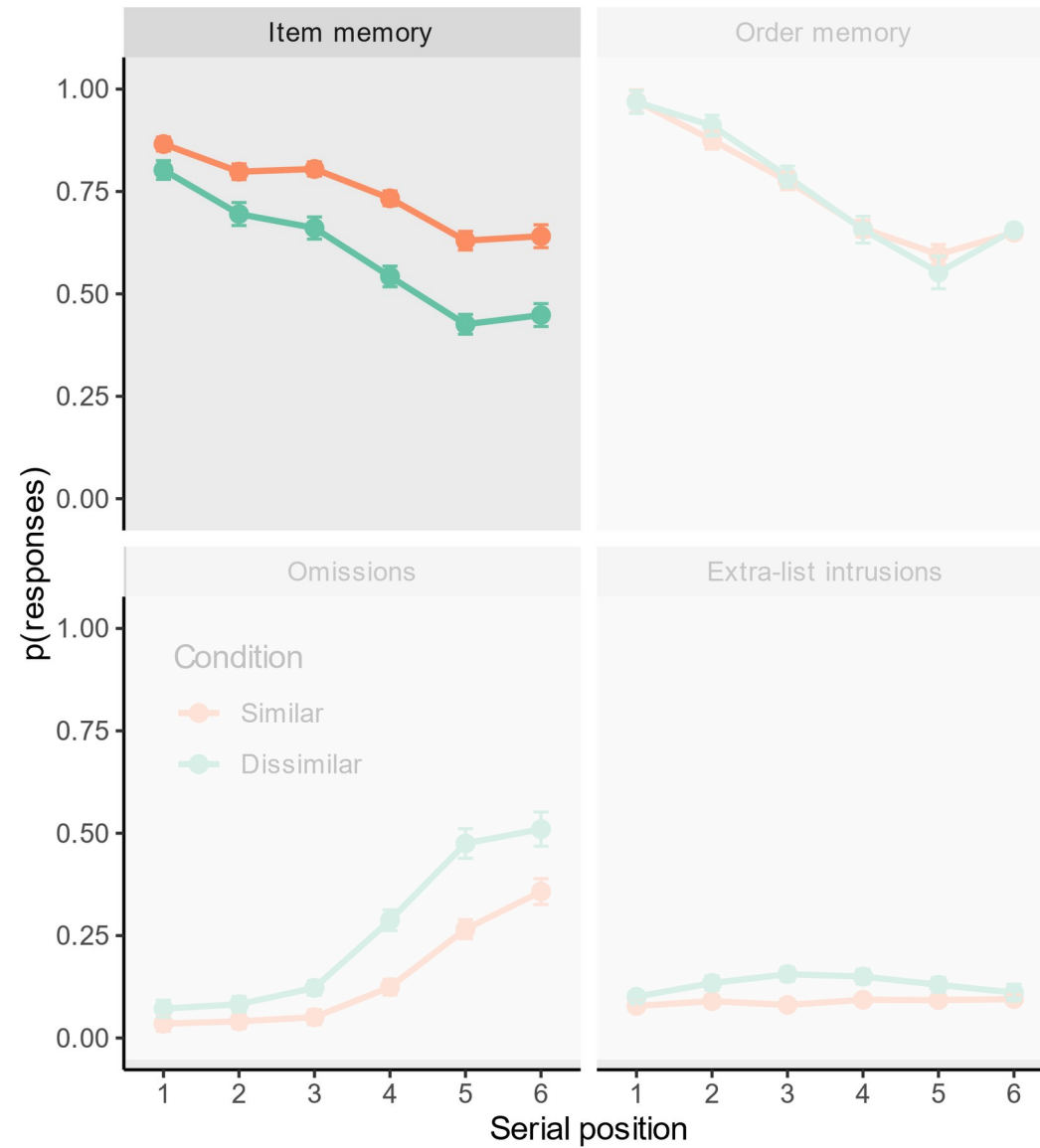


Luce's choice rule (exponential version)

= Temperature (free parameter)

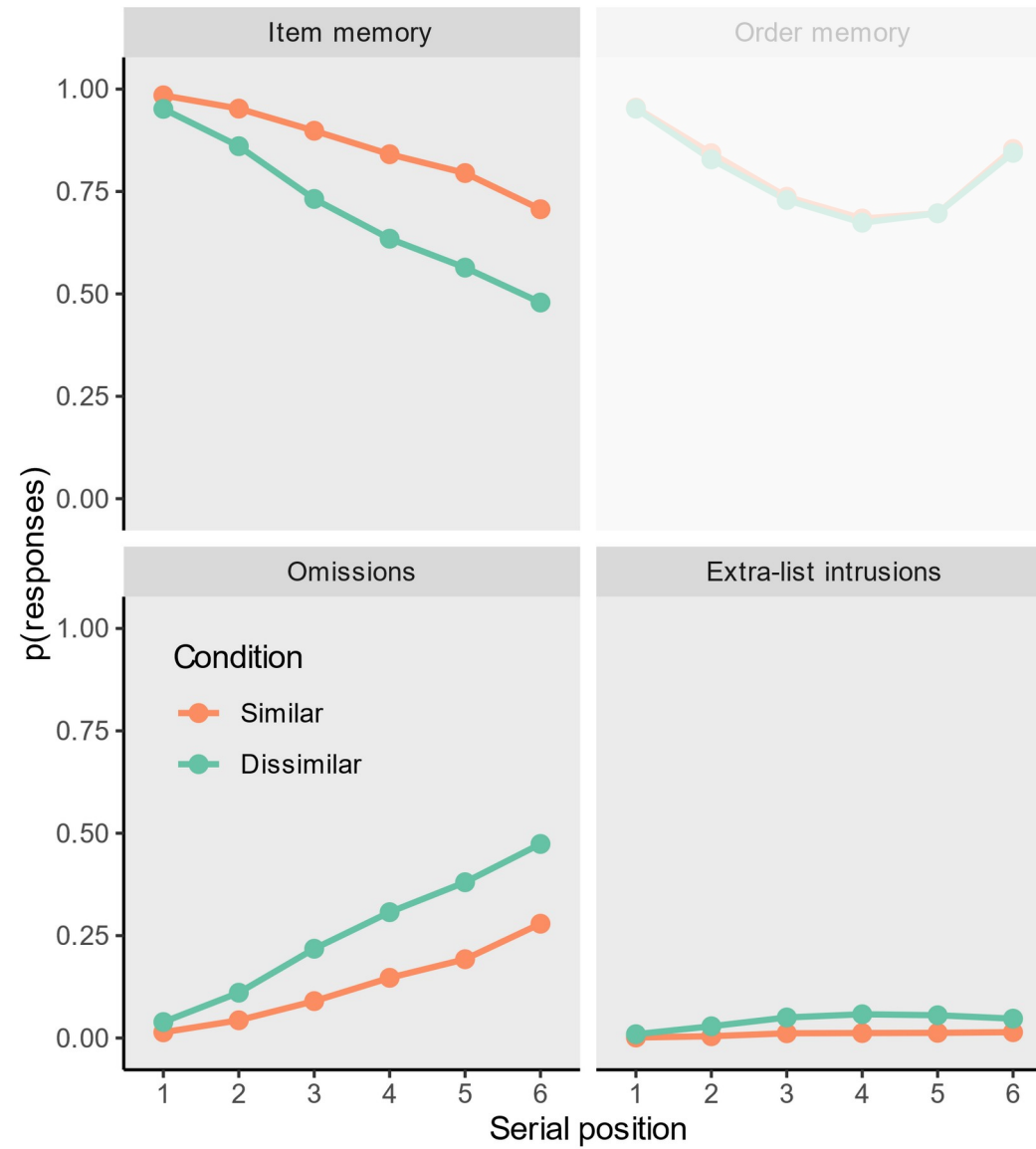
Results

Empirical data

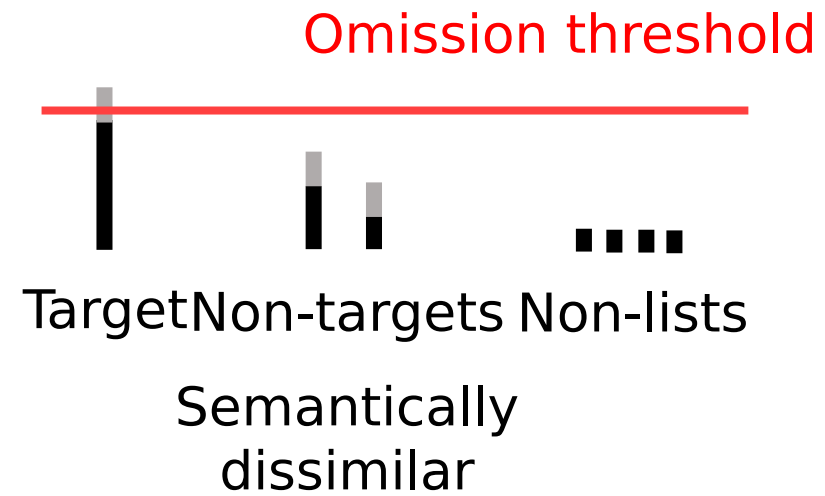
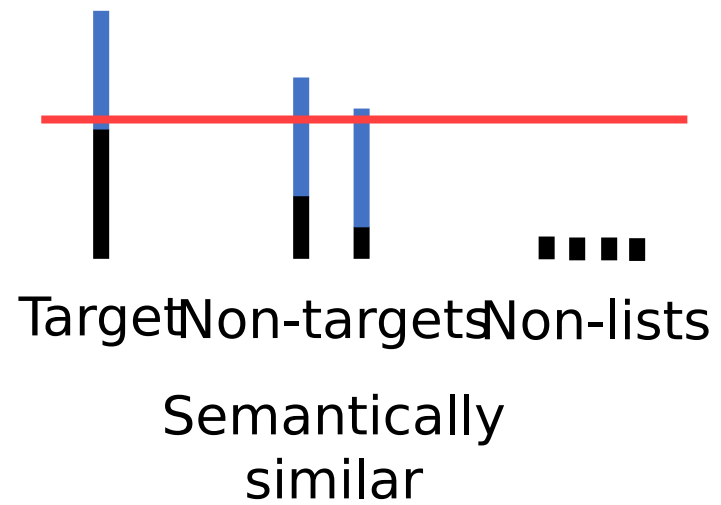


Results

Model

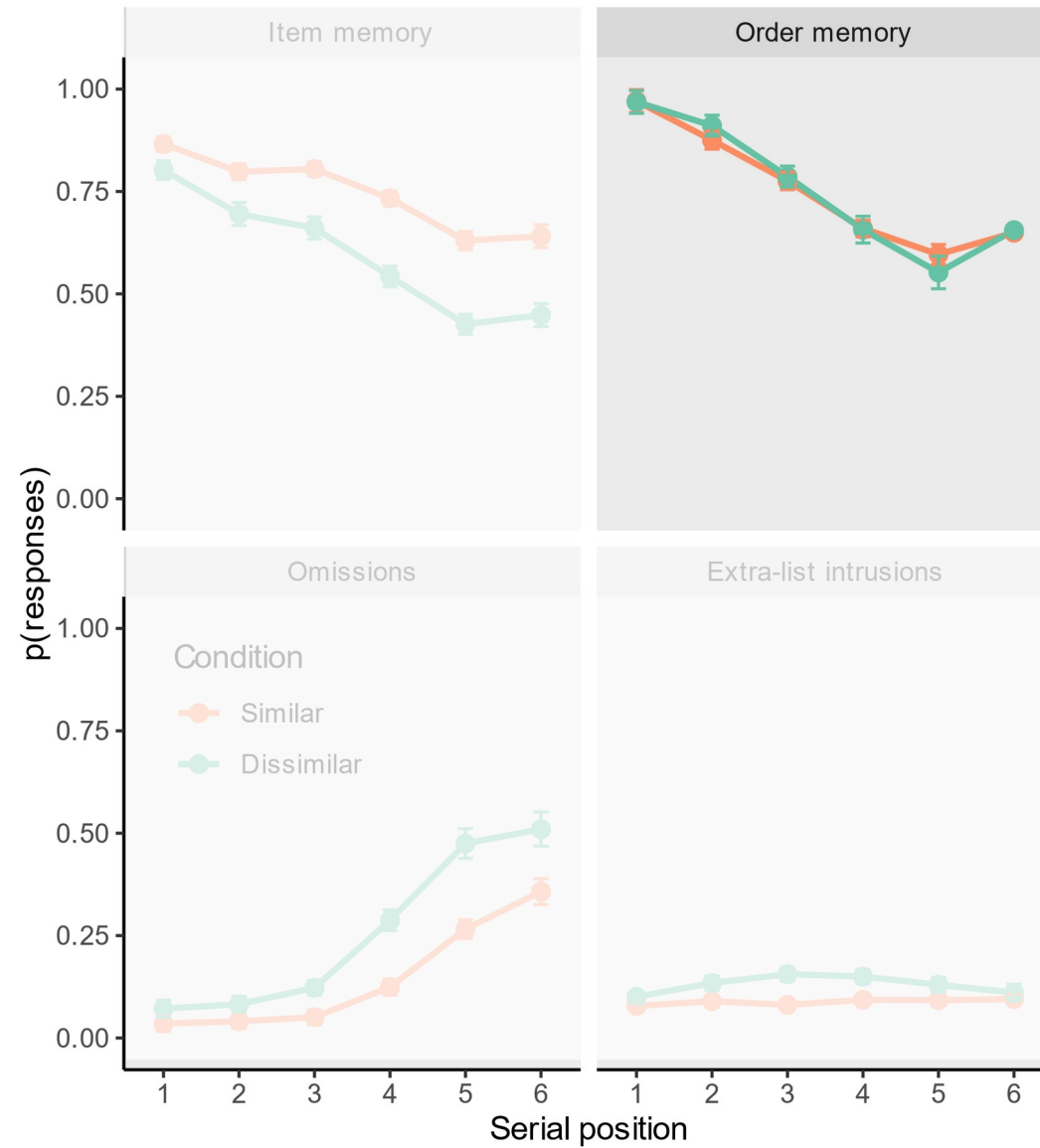


Results



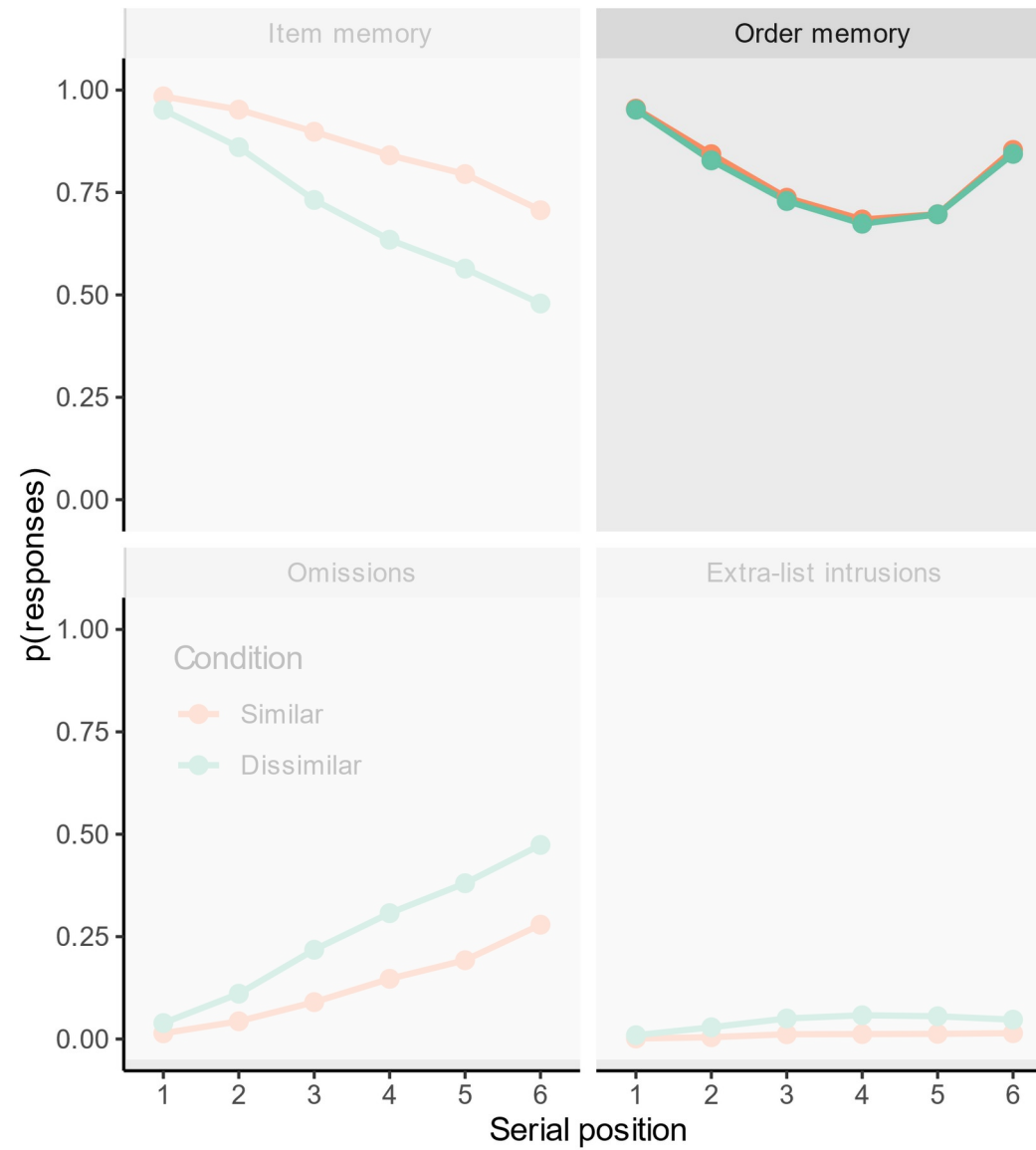
Results

Empirical data



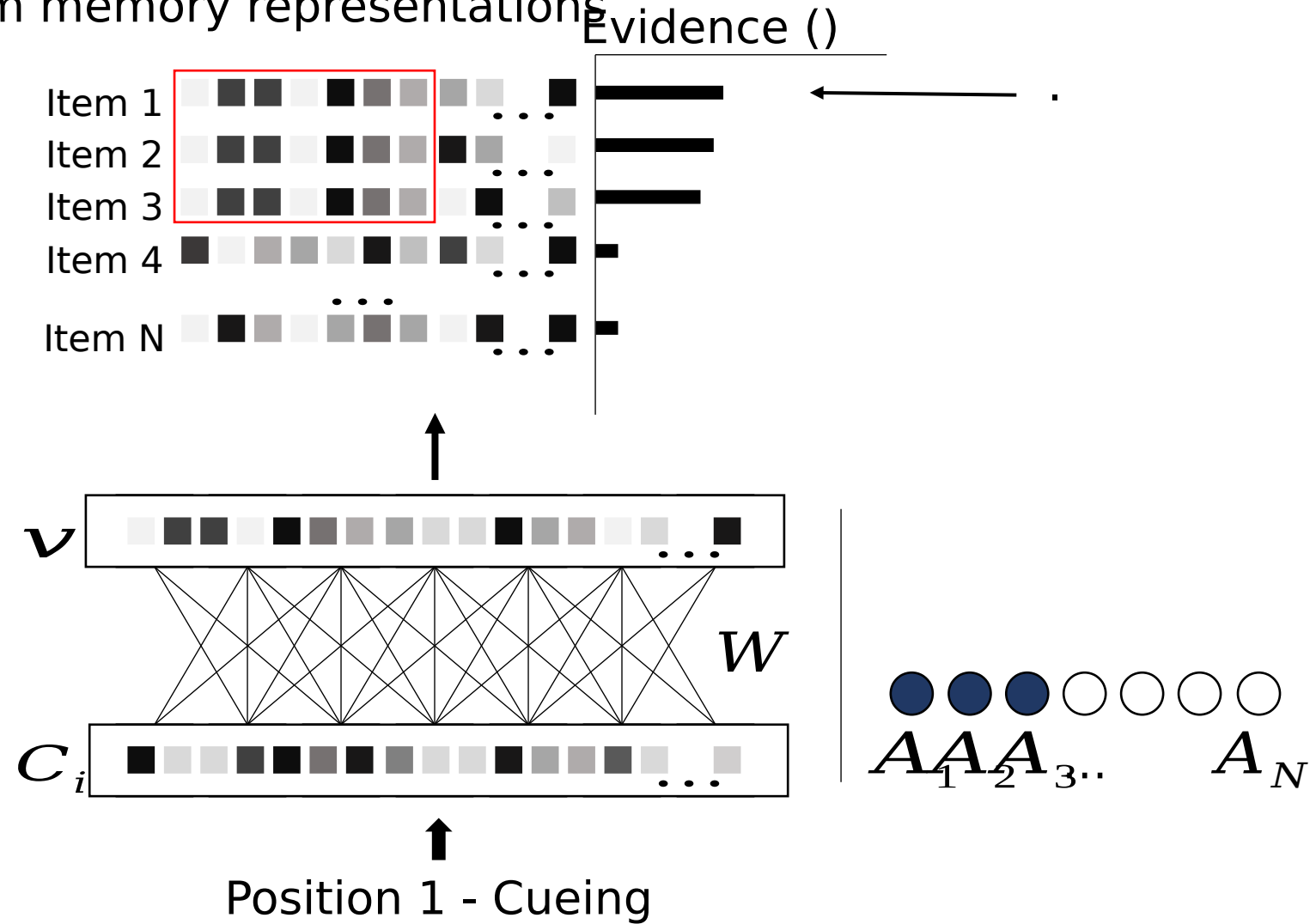
Results

Model

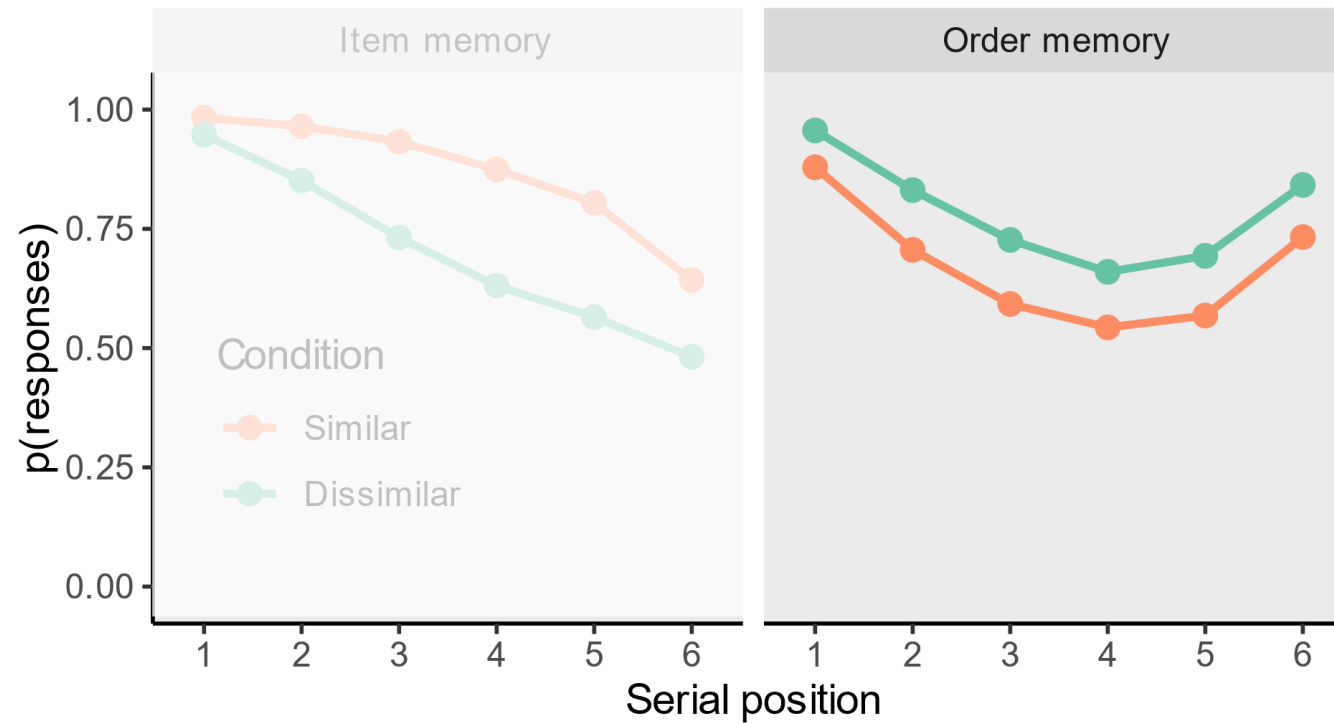


Results

Long-term memory representations



Rhyming similarity - model



The detrimental effect of phonological similarity boils down to a problem of **discriminability** between representations

The fact that semantic similarity **does not increase confusion errors** means that the semantic is **not** part of the representation

Probe recognition tasks

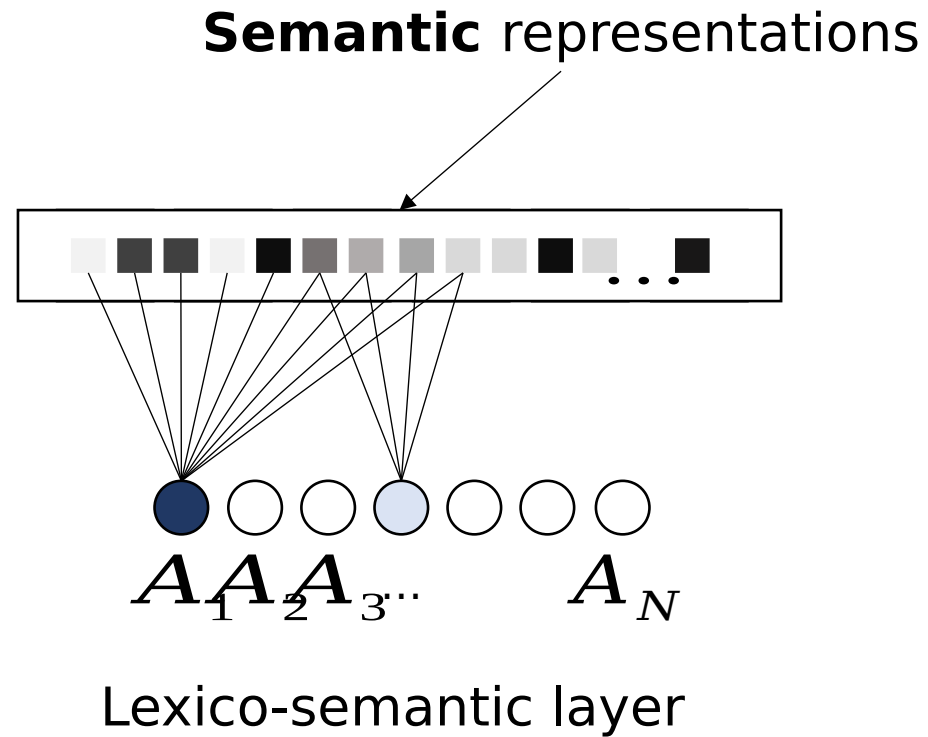
Mars, Pluto, Earth, Venus, Saturn, Jupiter

Neptun?

Leopard?

Increased false alarms

Discussion

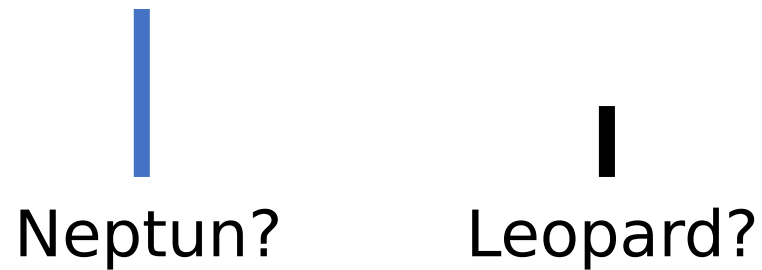


Discussion

Over-activation in lexico-semantic memory

Activation-monitoring framework (Gallo & Roediger, 2002)

Mars, Pluto, Earth, Venus, Saturn, Jupiter



Higher probability to respond « yes »

Is it a WM effect? Probably more a property of the **semantic system**

Semantic similarity **enhances item** memory...
While also leaving **order** memory **unaffected**

This pattern is well described by a model in which:

1. Semantic features are **not bound** to their context
2. Semantic similarity benefits WM through sustained activation in a lexico-semantic network

Thank you for your attention

