

# A Working Memory Model Integrating Meaning

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## Semantic relatedness

**Related:** Mars, Pluto, Earth, Venus, Saturn, Jupiter

**Unrelated:** tree, guitar, puma, laptop, banana, glove

## Serial recall

Encoding:

A B C D E F

Retrieval:

A \* D C \* Z

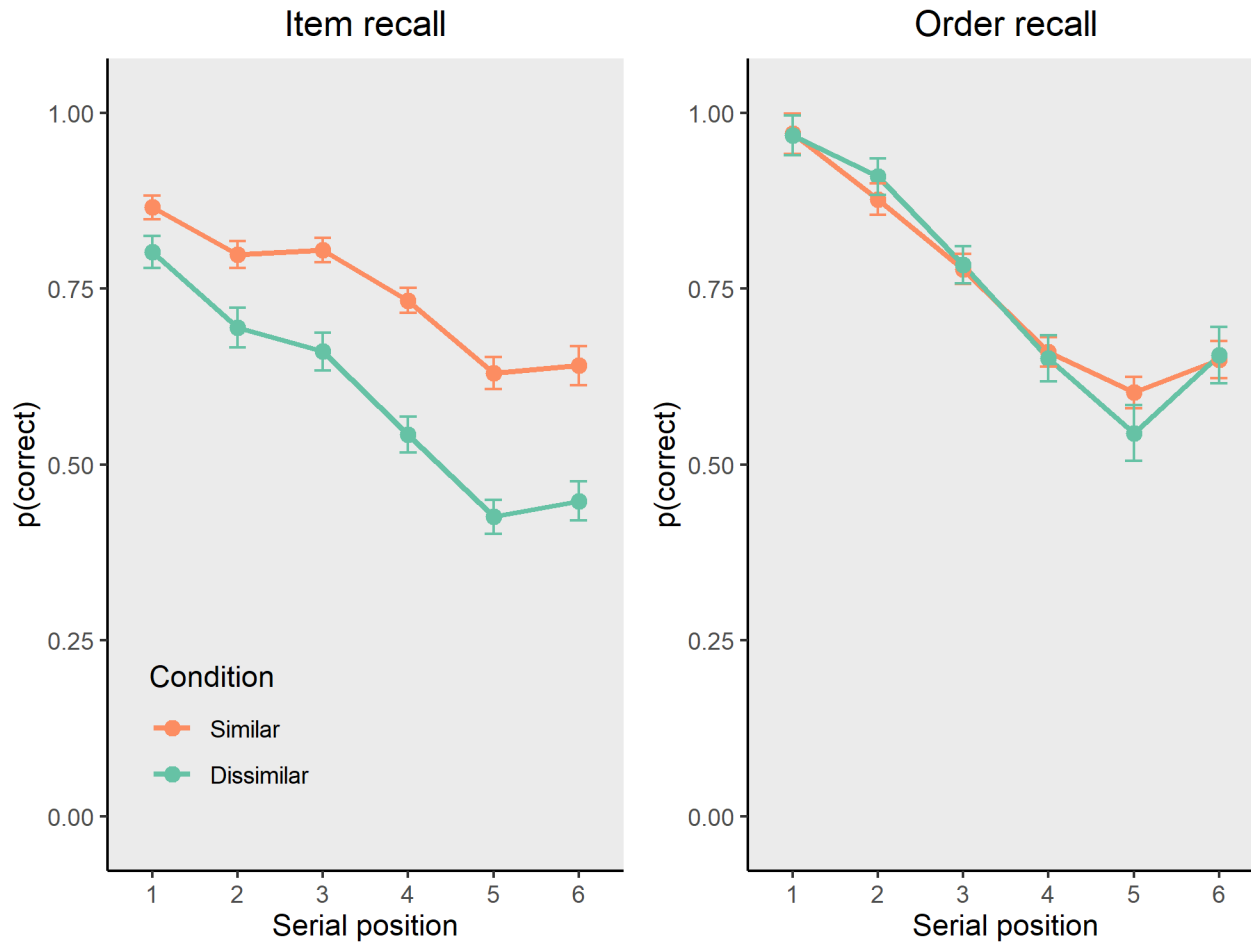
Item memory

$$3/6 = 0.5$$

Order memory

$$1/3 = 0.333$$

# Introduction



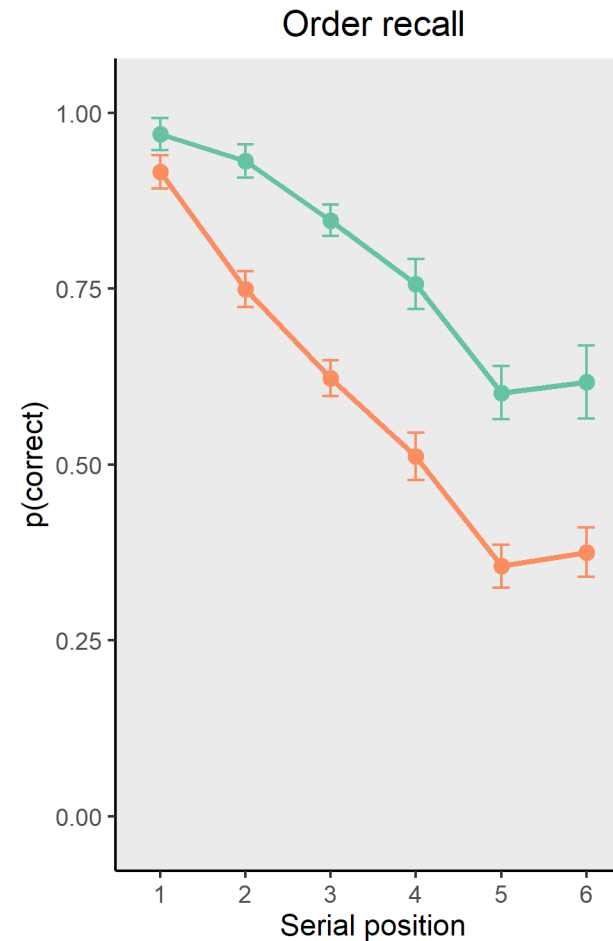
wialiewski, Krasnoff, Mizrak & Oberauer (*under review*)

## Phonological similarity

coke, soak, choke, woke, poke, folk

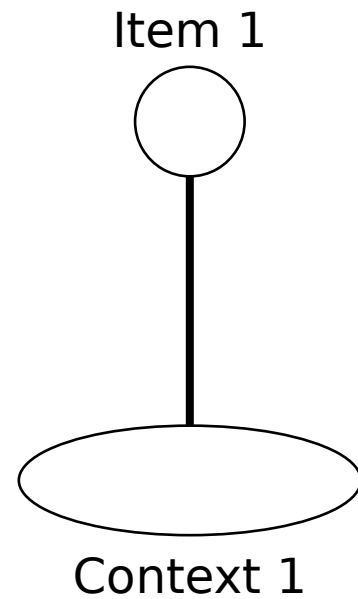
bug, rap, bowl, band, lied, kin

Baddeley (1966)  
Gupta et al. (2005)

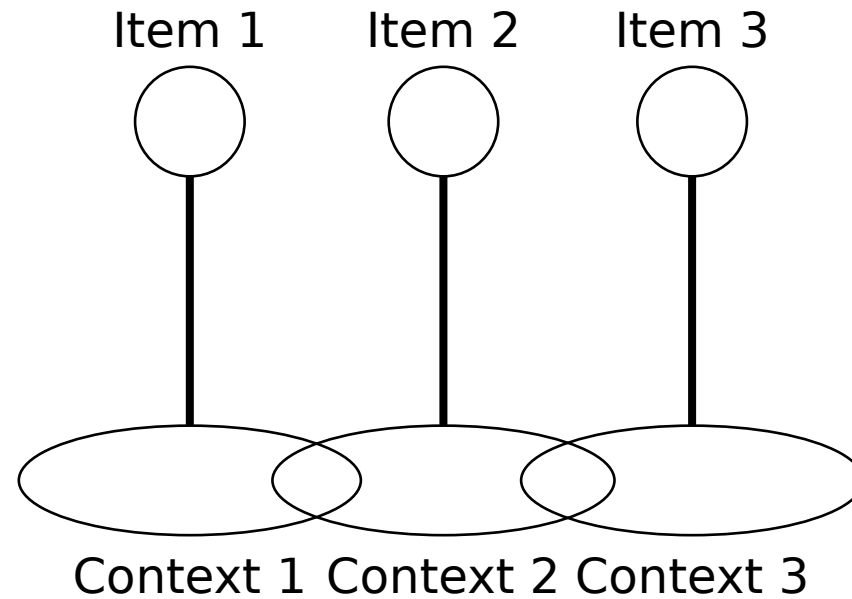


Working memory uses semantic knowledge

**How?**



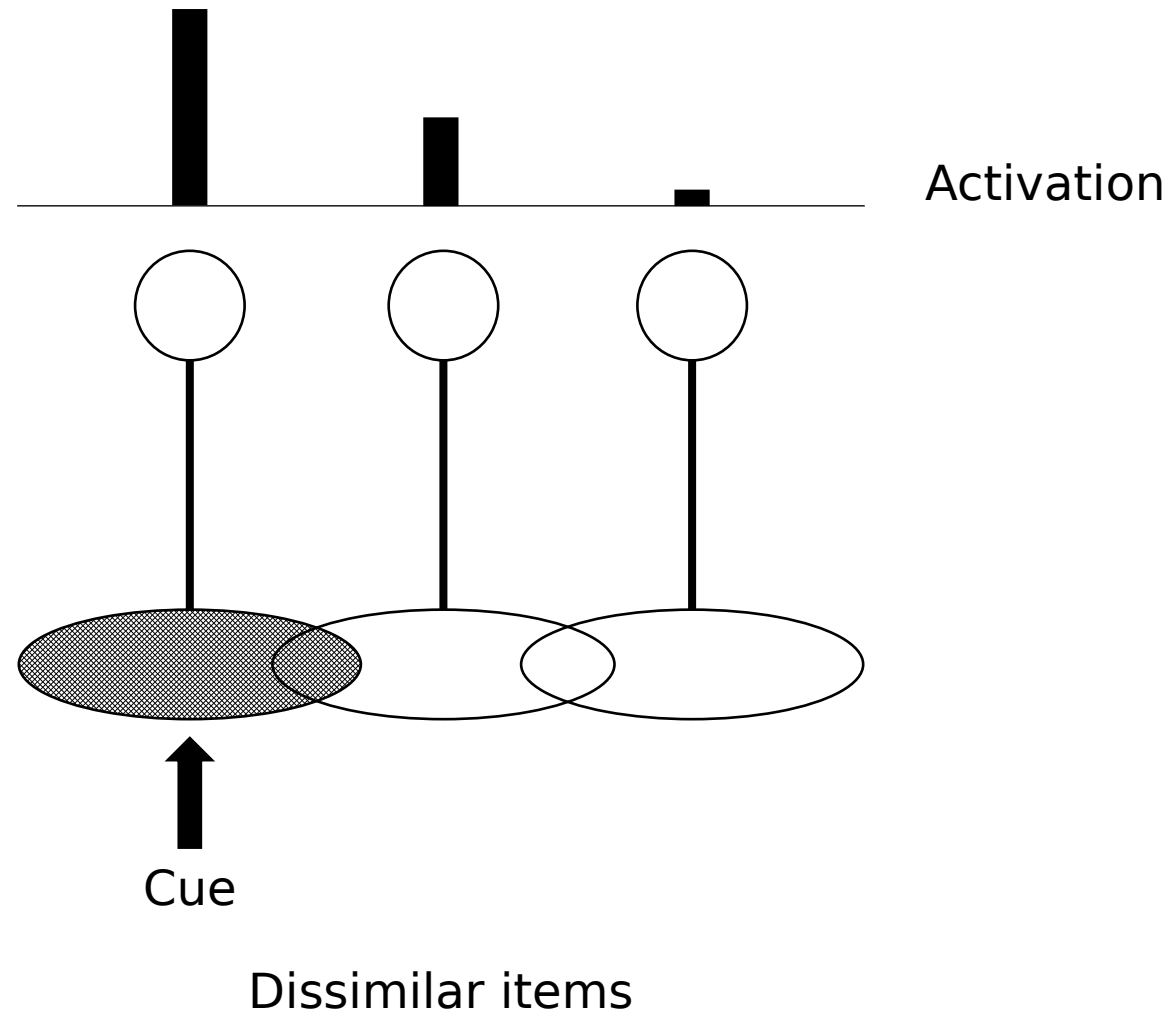
Burgess & Hitch (1999)  
Farrell & Lewandowsky (2004)  
Oberauer et al. (2012)



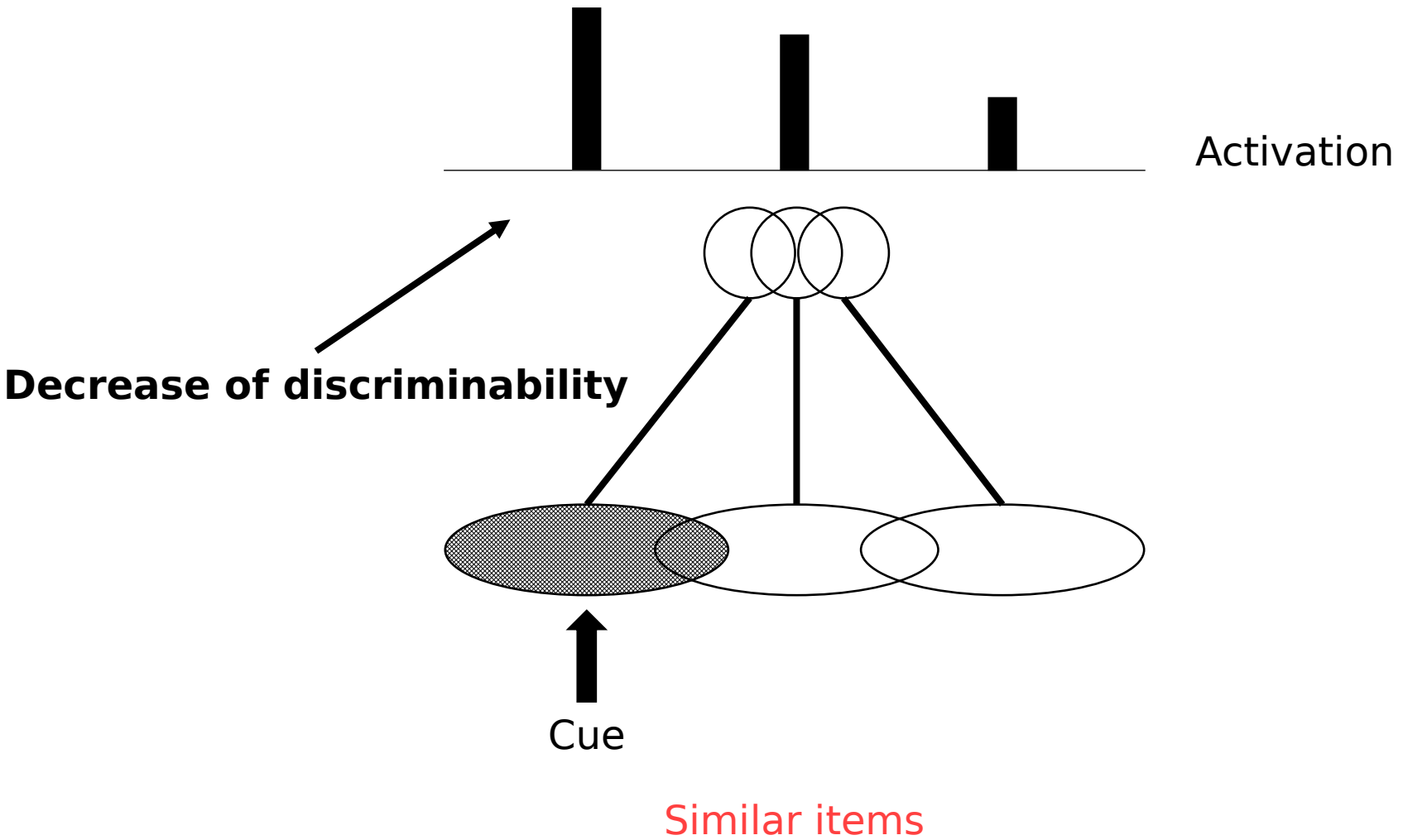
Dissimilar items



# Architecture



# Architecture

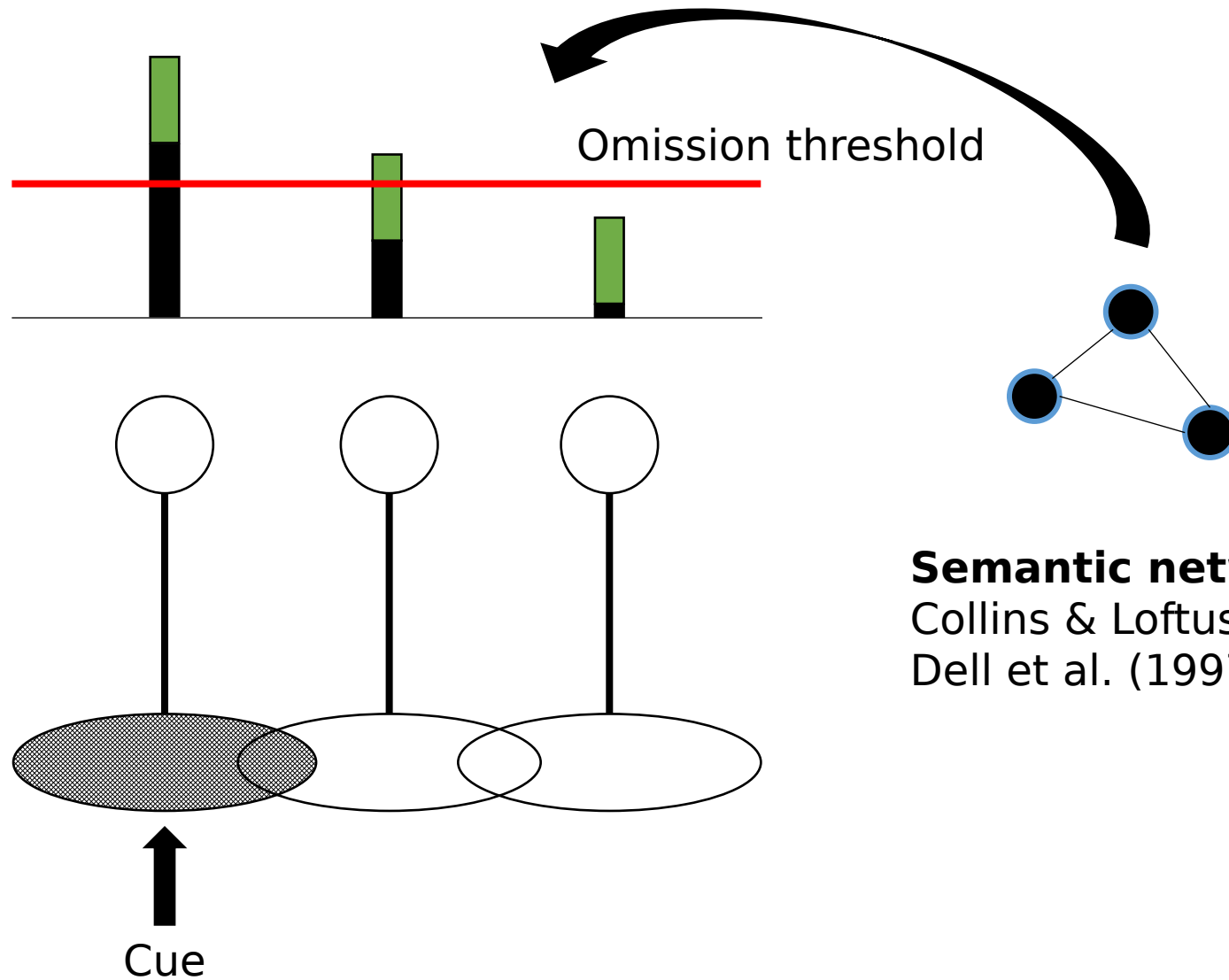


The fact that we **confuse phonologically** similar items implies that we **encode** phonological information

This is **not** observed for **semantic similarity**

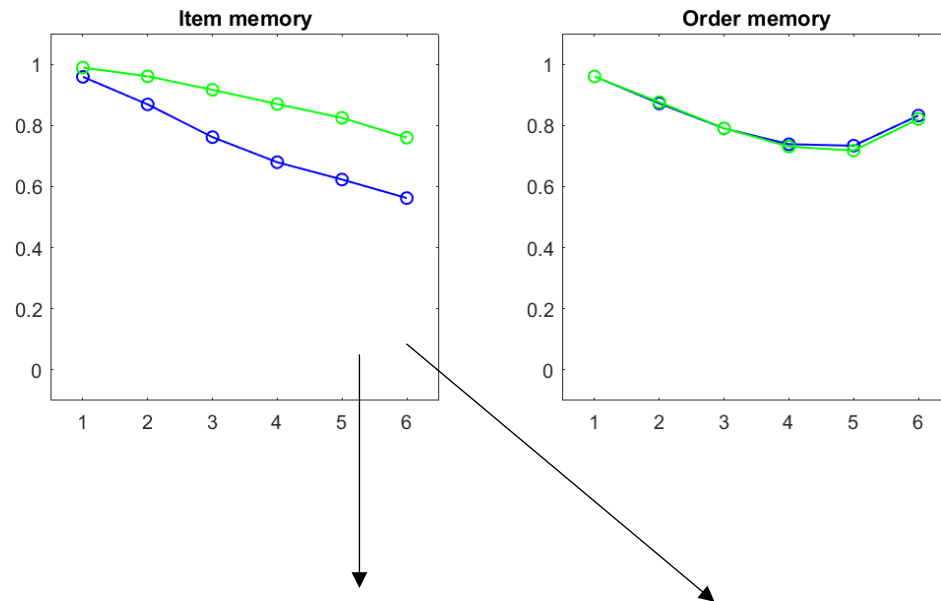
**Meaning is not encoded into WM**

# Architecture



**Semantic network**  
Collins & Loftus (1975)  
Dell et al. (1997)

# Results



Semantically related items **resist** more strongly to **interference** effects

When the core WM representation is **degraded**, retrieval can still occur by using **long-term memory**.

Neale & Tehan (2007)

Kowialiewski & Majerus (2020)

Meaning is not directly encoded in WM

Semantic may support WM through sustained activation in a long-term memory semantic network

**Spreading activation principle**

Collins & Loftus (1975)

Dell et al. (1997)

**Activated long-term memory**

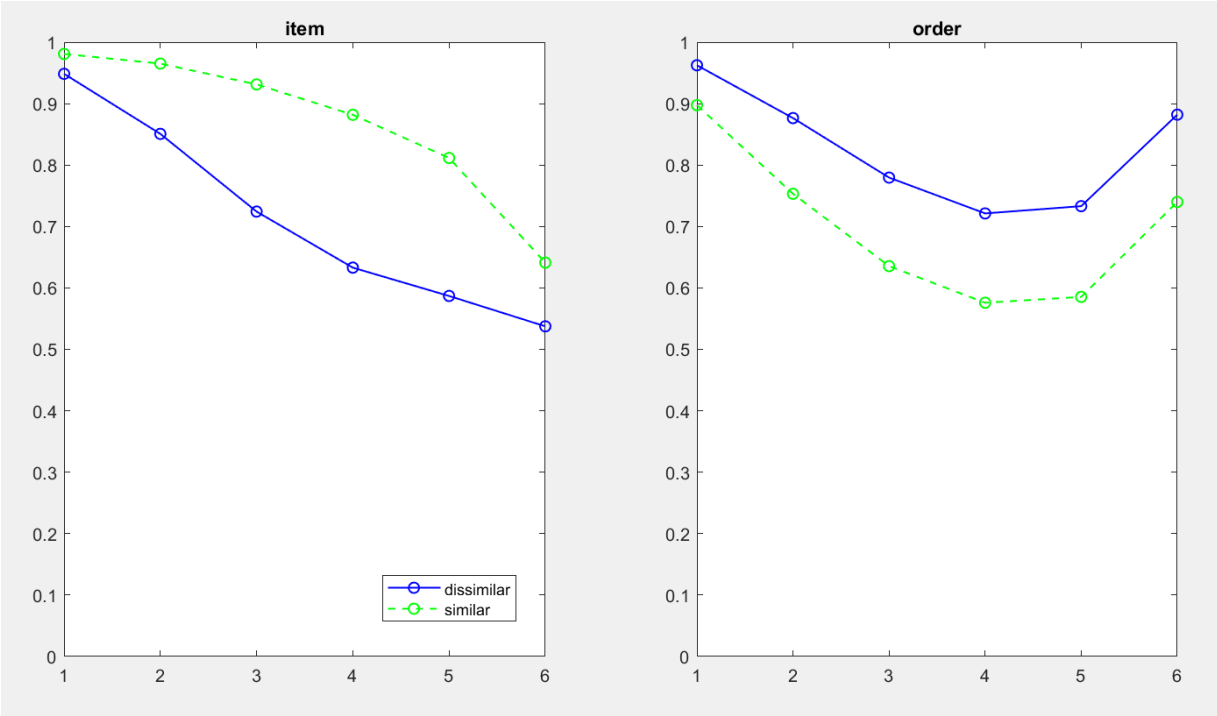
Cowan (1995)

Oberauer (2009)

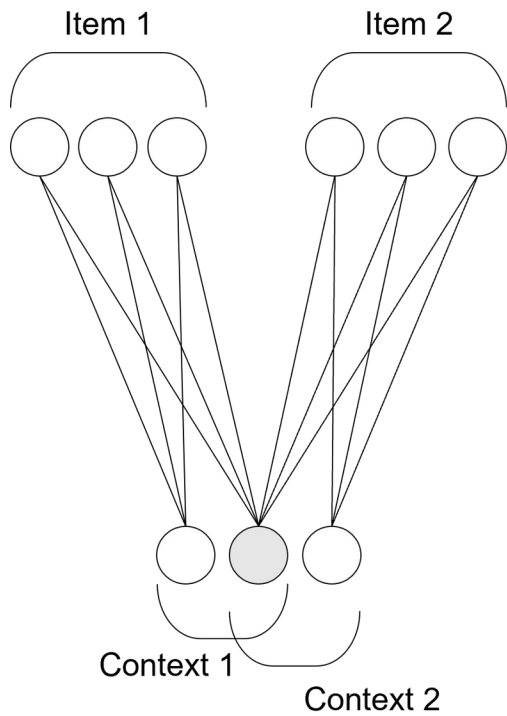


Thank you for your attention

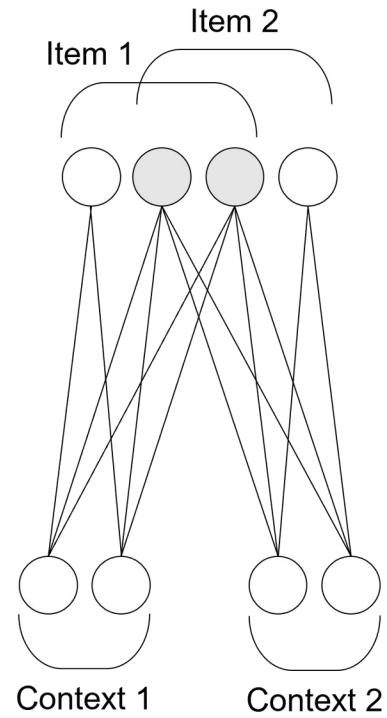
# Interference models - rhyming similarity



Scenario A



Scenario B



Scenario C

