Language

Weighting: 2/17

Yaxley, R. H., & Zwaan, R. A. (2007). Simulating visibility during language comprehension. *Cognition*, *105*, 229–236. https://doi.org/10.1016/j.cognition.2006.09.003

# Agenda

* What is language?
* The article: Simulating visibility during language comprehension
* Motivation and hypothesis
* Method
* Results
* Authors’ conclusion
* Criticism
* Greater perspective

## What is languge?

RA: A shared symbolic system for communication

# The article: Stimulating visibility during language comprehension

The article investigates language processing influence on object verification

Do language based mental simulations include perceptual traces hinted at from environmental factors or are they limited to decontextualized object features?

## Motivation and hypothesis

“Therefore, comprehenders should be faster to recognize a picture of the described object that matches the level of visual resolution (i.e., high vs. low) than one that does not match.

This study was designed to test if the level of visual resolution represented during language processing influences picture verification.“ (p. 231)

## Method

### Pilot study

* Tested how occluded a picture have to be to have an effect on object identification, while not effecting accuracy. 50% occlusion had some effect on RT but none on accuracy

### Main study

*N* = 80 undergraduate students. 96 sentences: 48 experimental, 48 fillers

* Each participant saw 24 experimental sentence-picture-pairs (12 congruent and 12 incongruent) and 48 filler sentences (72 sentences in total, 36 requiring yes, 36 requiring no)
* Experimental: “Through [medium x], the agent could see the “object Y””
* Filler(48): 36: “Agent interacting with a concrete object”, 12: “An agent sees an object” (no emphasis on clarity)
  + 36 no answers, 12 yes answers.

## Results

### Table 1: congruity produces faster picture verification

* Significant interaction between pictures and sentences: “Match between sentences and pictures elicited shorter picture-verification latencies than did mismatching pictures and sentences.” (p. 234)
* Main effect of picture type: “There was also a significant main effect of picture type” (p. 234)
* “Clear pictures were responded to more quickly when preceded by a clear sentence than when preceded by an unclear sentence
* and unclear pictures were responded to more quickly when preceded by a unclear sentence than when preceded by a clear sentence

|  |  |  |
| --- | --- | --- |
| Sentence verification latency | Clear sentence (*M/SD (ACC)*) | Unclear sentence (*M/SD (ACC)*) |
| Clear picture | **635/150 (97%)** | 658/163 (98%) |
| Unclear picture | 699/154 (98%) | **670/147 (99%)** |

* **These findings demonstrate that language processing invokes the visibility of objects given described environmental context**

## Authors’ conclusion

Findings demonstrate that participants hold in mind images affected by their described context and visibility

Language processing invokes mental representations that take experiential/perceptual traces into account

# Criticism

* Are we measuring uncertainty? Is the slower response time for incongruent trials due to participants being uncertain about the correctness of their response given that the object appears slightly different from the one described?
  + Even if participants are unsure what to answer in such a case, they are “aware” that there is an inconsistency between their mental image and the one presented on screen.

# Grand perspective™

* Context availability model: Concrete words and how they are anchored in our semantic network
  + Free recall
* How semantic knowledge is stored
  + Sensory/functional theory: Conceptual knowledge is organised according to sensory information (shape, colour, etc.) and function (movement, action etc.) -> A hammer is stored next to the drum since both is a tool used for banging
  + Domain-specific theory: Knowledge is stored according to its semantical category: Furniture, family members, transport etc.
    - Priming: Doctor - Nurse vs Doctor - noodle
    - Semantic network: Has wings, can fly -> aeroplane, bird, fly
* Fan effect: several professions per location (doctor and lawyer at the park) are easier to remember than several locations per profession (lawyer at the park, lawyer at the hospital)
* GSR: Experiments with words and how they are perceived
* Sternberg: Masking vs unmasking (masked generally took longer)
* Priming effect: They are primed to look for the *object* -> Yaxley
* Fiebach & Frederici: Left basal temporal areas involved in higher-level visual processing and mental imagery were more strongly activated during processing of concrete words, whereas a left inferior frontal region showed greater activity during abstract word processing (s. 69)
* **Adelman et al**: Letters in words are processed in parallel. This effect is more prominent for the first couple of letters in a word, since we often don’t articulate the last parts of our words (due to overlap with the following word in a sentence)

Fra NOTER-TIL-ALT: Ord er forbundet med andre ord i en sætning: ikke klar adskillelse ml. bogstaver i tale  fra kategorisk perception til koartikulation  kontekst/sætning påvirker perception (vi hører hvad der giver mening hvis lyden er tvetydig) (top down)