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# Time course study of single-word context effects: Evidence from activation of homograph meaning

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## Introduction

This paper is concerned with lexical context effects on the access of polysemic word meaning. Whereas the Interactive conception (Marslen-Wilson & Tyler, 1987) argues for a context-dependent access, the Modularist one assumes that initially, "what matters is merely the associative relation between the prime word and the target word" (Kintsch, 1988). Concerning the lexical effects, these two conceptions can be reconciled with the hypothesis that the combination of lexical items can prime related word, as proposed by Duffy, Henderson, & Morris (1989).

## Experiment

The critical stimuli were twenty-four triples of French words, comprising a context-word, a homograph, and a target word corresponding to the dominant meaning of the homograph. The context word was related to the dominant or to the subordinate meaning of the homograph, or was not semantically associated to it. The temporal interval between the prime and the target (ISI) was equal to 50 ms. for 18 subjects and to 350 ms. for the 18 others.

Each trial began with the display of the context word presented for 100 ms. Next, the homograph was presented for 100 ms., immediately followed by a mask presented during either 50 or 350 ms. This mask was replaced by the target word that remained on the screen until subjects made a lexical decision.

Table 1: Mean decision times as a function of the ISI and of the Context word.

| ISI | Context word | | | mean |
|---|---|---|---|---|
| | dominant | neutral | subordinate | |
| 50 ms. | 552 | 588 | 568 | 569 |
| 350 ms. | 504 | 526 | 523 | 518 |
| mean | 528 | 557 | 545 | |

Lexical decisions were faster for the dominant condition than for the neutral one ($F1(1,68)= 9.35$, $p < .01$; $F2(1,46)= 3.34$, $p = .07$), whereas the comparison opposing the subordinate condition to the two others conditions was not significant ($Fs<1$). There was no significant interaction between the ISI and the Context word factors ($Fs<1$). The data show that a word presented as a context can immediately constrains the access to the meaning of the homograph.

## Simulation

We have attempted to reproduce the lexical decision data with two-steps simulations carried out with the Construction-Integration model (Kintsch, 1988). In the first step, activation spreaded from the context and the prime words to their direct associates in the associative net. When the pattern of activation values stabilized, the value was higher for the node corresponding to the target word in the dominant condition than in the neutral one. In the second step, links were added between all the concepts associated in the knowledge net and the activation continued to spread. When the stabilization criterion was reached, the activation value for the target word was again higher in the dominant than in the neutral condition.

Table 2: Final activation values for the target word corresponding to the homograph "*objectif*" (which has two meanings in French, *aim* or *lens*).

| | Context word | | |
|---|---|---|---|
| | dominant | neutral | subordinate |
| First step | .3399 | .2230 | .1926 |
| Second step | .3427 | .2259 | .2092 |

## Conclusion

In summary, lexical decisions were immediately facilitated when a related word was presented before the prime-target pair. Simulations carried out replicated this result, suggesting that context effects provided by lexical items can be conceivable within a modularist theoretical framework.

## References

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