

Object recognition in young adults: is priming with pantomimes possible?

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INTRODUCTION

Until now semantic priming has only been studied by means of pictures or words of objects as prime and target. Considering that the meaning of manufactured objects is closely linked to the functions they fulfil and the actions they are associated with (Martin et al., 1996; Murata et al., 1997), we have decided to explore the role and the nature of this link in the organization of semantic systems. We conducted four experiments with a priming paradigm where participants received short pantomimes as primes and pictures of manufactured objects as targets. In order to dissociate lexical from semantic effects, different tasks were used: naming involving lexical and semantic facilitation versus object decision not involving language. Moreover, given the role of the Stimulus Onset Asynchrony (SOA) in determining the type of processing (automatic vs controlled), we varied SOA across experiments.

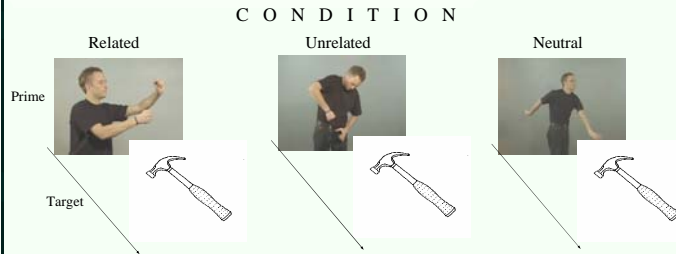
METHODS

Experiments In the first experiment, we used a *naming task (NT)* and a SOA of 1200 msec. In the three following ones with an *object decision task (ODT)*, we used respectively SOAs of 1200, 800 and 400 msec. All items were repeated 6 times in the NT and 5 times in each ODT.

Procedure Participants were shown short pantomimes that could be *related* (e.g. to hammer) or *unrelated* (e.g. to uncork) to the target (e.g. hammer) according to the condition. They had to answer as quickly as possible after the target's appearance. Reaction Times (RT) in msec was the elapsed time between the target's appearance and the beginning of the participant's answer. A *neutral* condition (meaningless prime) was added in the three object decision experiments in order to determine the facilitation and the inhibition effects.

Participants 16 young adults took part in each study. They had no neurological impairment and had a normal or corrected-to-normal vision.

STIMULI & HYPOTHESIS

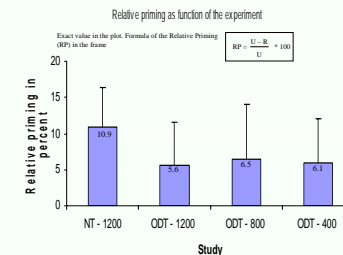
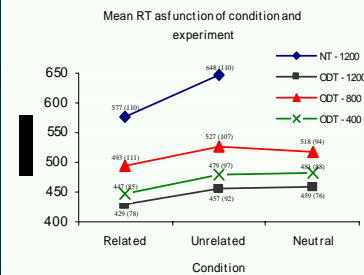


Hypothesis: 1) Given the predominant role of actions in the tool's meaning, we expect a robust effect in all four experiments. Therefore, a much shorter RT in the related condition is expected.

2) Compared with the ODT, the NT favors, in addition to a semantic priming, a great lexical priming effect (as well on the level of the verbal association strength as on the level of the morphological and phonological links). Therefore a larger priming effect in the naming experiment is expected.

3) Automatic priming effect is usually smaller than controlled (strategic) priming effect. Consequently, the shorter the SOA, the smaller the priming effect should be.

RESULTS



First presentation of all items was discarded from statistical analysis. In all experiments, Mean RT in the *related* condition is significantly shorter than mean RT in the *unrelated* condition at $P < .05$. In all the OD experiments, mean RT in the *neutral* condition doesn't differ from the mean RT in the *unrelated* condition. No interaction between condition and repetition was found.

Relative Priming (RP) is the RT's difference in the related condition (R) relative to the unrelated one (U) divided by the RT in the unrelated condition. Relative priming in the NT-1200 (10.9%) is significantly greater than those in the ODT-1200 (5.6%) and ODT-400 (6.1%) experiments ($p < .05$). Moreover, a tendential difference ($p = .07$) is found between NT-1200 (10.9%) and ODT-800 (6.5%). No differences are found between the OD experiments.

DISCUSSION

Priming by pantomimes is undoubtedly possible and seems even more effective than usual priming stimuli (objects' pictures or words). Confirming our hypothesis, a greater priming effect was found in the naming experiments compared with the object decision experiments. This can be explained by the fact that the naming task requires an access to the lexical aspects generating an important lexical priming effect. Surprisingly, no modulation of the priming effects according to the SOA was observed. More than a long SOA, it is the combination between a long SOA and a high proportion of related items that induces controlled (strategic) processing and an increase of the priming effect. As we kept a constantly low proportion of related items (25% in each experiment), it prevented participants to adopt any strategy.