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# False memories and lexical decision: even twelve primes do not cause long-term semantic priming

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## Abstract

Semantic priming effects are usually obtained only if the prime is presented shortly before the target stimulus. Recent evidence obtained with the so-called false memory paradigm suggests, however, that in both explicit and implicit memory tasks semantic relations between words can result in long-lasting effects when multiple ‘primes’ are presented. The aim of the present study was to investigate whether these effects would generalize to lexical decision. In four experiments we showed that even as many as 12 primes do not cause long-term semantic priming. In all experiments, however, a repetition priming effect was obtained. The present results are consistent with a number of other results showing that semantic information plays a minimal role in long-term priming in visual word recognition. © 2002 Elsevier Science B.V. All rights reserved.

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## 1. Introduction

A well-known finding, often reported in the literature, is that a response to a word (e.g., *lion*) is faster and more accurate if the target word is presented in the immediate context of a related word, the prime (e.g., *tiger*), than if it is presented in the context of an unrelated word (e.g., *chair*). This *semantic priming* effect was first

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obtained by Meyer and Schvaneveldt (1971) and has been replicated many times (e.g., Balota & Lorch, 1986; McNamara, 1992; Zeelenberg, Pecher, de Kok, & Raaijmakers, 1998). Another well-known finding is the *repetition priming* effect. Responses to words are faster and more accurate for recently studied words than for words that have not been studied recently (e.g., Ratcliff, Hockley, & McKoon, 1985; Scarborough, Cortese, & Scarborough, 1977; Wagenmakers, Zeelenberg, & Raaijmakers, 2000).

One remarkable difference between semantic priming and repetition priming concerns the time interval over which both effects can be obtained. The semantic priming effect has been shown to be an extremely short-lived phenomenon. In the standard semantic priming paradigm, the prime is presented immediately prior to the presentation of the target. A number of studies have shown that the priming effect is eliminated if one or more unrelated words intervene between the presentation of the prime and the target (Bentin & Feldman, 1990; Dannenbring & Briand, 1982; Kirsner, Smith, Lockhart, King, & Jain, 1984; Masson, 1995). Some studies (Joordens & Besner, 1992; McNamara, 1992) have found that priming can survive the presentation of one intervening unrelated word, but even in those cases the size of the priming effect was reduced dramatically by the presentation of an intervening word. For example, McNamara obtained a 30-ms priming effect when no words intervened between the prime and target, a 21-ms priming effect with one intervening word and no effect (i.e., a nonsignificant – 2-ms effect) with two intervening words. In contrast to semantic priming, repetition priming is obtained even when long periods of time and numerous unrelated items intervene between the first and second presentation of the target word. Several reports indicate that repetition priming can be obtained even when the first and second presentation of a word are one or more days apart (e.g., Jacoby & Dallas, 1981; Scarborough et al., 1977).

In contrast to the results mentioned above, Becker, Moscovitch, Behrmann, and Joordens (1997) recently obtained evidence for long-term semantic priming using an animacy decision task. In accordance with the results of previous studies, they obtained no long-term semantic priming, however, in a lexical decision task. Becker et al. proposed that a single mechanism underlies both repetition priming and long-term semantic priming and described a distributed connectionist type model for word recognition to account for their results. In this model, presentation of a prime causes learning of the pattern associated with that word by strengthening the connections between activated nodes. This learning speeds up later processing not only of the same word, but also of words that are *similar* to the prime because these words have a large part of their pattern in common with the prime. In this model, long-term semantic priming is due to the overlap of the semantic patterns of prime and target. Becker et al. argued that the different results in animacy decision and lexical decision are due to the different extents to which performance in both tasks relies on semantic processing. They argued that performance in animacy decision relies primarily on semantic processing whereas performance in lexical decision relies primarily on orthographic processing. Therefore, they argued that in a

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