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Short term implicit memory in lexical processing

Elinor McKone

A thesis submitted for the degree of Doctor of Philosophy
of the Australian National University,
Canberra, Australia

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Declaration

The work presented in this thesis is entirely my own.

A handwritten signature in cursive script, reading "Elinor McKone".

Elinor McKone

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Publications arising from the thesis

Experiments 2.1, 2.2, 3.2 and 4.1 will shortly appear in the following article:

McKone, E. (in press). Short term implicit memory for words and nonwords.
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Abstract

A single recent presentation of an item can lead to substantial improvement in speed or accuracy of processing when that item is presented subsequently, a phenomenon referred to as repetition priming. This empirical finding has been considered within two general frameworks. The first can be termed a "perceptual" approach, in which the perception of the target occurs more easily due to a transient change in the state of the target's internal representation. The second can be termed a "memory" approach, in which priming is seen as an example of implicit memory, that is, as arising from subconscious, nondeliberate access to a trace of an earlier event.

This thesis examined repetition priming for words and nonwords from both perspectives. A review of priming within a word recognition framework suggested that transient modifications of lexical representations might be able to endure for several seconds, allowing a short-lived priming effect for words and word-like nonwords. A review of priming within a memory framework suggested that there might exist a short-lived implicit memory form, with a duration similar to that of explicit working memory.

Empirical work examined priming over short lags (generally 0-23 items intervening between repeats) using lexical decision and speeded naming tasks. A novel short-lived repetition effect was apparent, superimposed on standard long-lived priming. For words, this effect endured until lag 3 (8 seconds). More rapid decay was apparent for nonwords, producing a lag $\times$ lexicity interaction.

Short term priming was distinguished from long term priming on the basis of decay rate, the effects of word frequency, and the effects of the proportion of repeated items in the list. Short term priming was distinguished from explicit working memory on the basis of the effects of lexical status and overall differences in speed and accuracy.

Finally, short term priming was shown to decay through the effects of both spontaneous trace loss and interference. The effect of interference on nonword priming was particularly severe, and the relative effects of interference were shown to be responsible for the form of the lag $\times$ lexicity interaction.

The results are interpreted as showing that (a) short term priming reflects the operation of a novel memory form, namely, *short term implicit memory*, (b) this memory arises (for lexical items) within the perceptual system responsible for word recognition, possibly through transient modification of

orthographic representations, and (c) the word recognition system therefore retains a number of partially-active words simultaneously. It is suggested that short term implicit memory might exist to allow the integration of successively-presented stimuli across a short time window of perceptual processing.

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