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# The word frequency effect in short-term serial recall

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**The word frequency effect in short-term serial recall**

A thesis submitted in fulfilment of the  
requirements for the award of the degree

**Doctor of Philosophy**

**from**

**UNIVERSITY OF WOLLONGONG**

**By**

**Leonie M. Miller, B. Ed. (Sec. Math., with Distinction), B. Math. (Hons),  
B. Psyc. (Hons)**

**School of Psychology**

**June 2010**

## **Thesis Certification**

### CERTIFICATION

I, Leonie M. Miller, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Psychology, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Leonie M. Miller

June 9 2010

## Abstract

Recent research into the nature of the frequency effect in immediate serial recall has revealed that some aspects of the mnemonic influence of word frequency over the short-term are not well accommodated by current explanations of the effect (i.e. item-based redintegration). In particular, the finding that how well a word is recalled is dependent on the relationship between that word's frequency and the frequencies of other list items suggests that processes far greater in complexity than previously assumed underpin the encoding, retention and retrieval of to-be-remembered material. This thesis assesses the word frequency effect according to two lines of investigation. It firstly examines the relationship of word frequency with a second lexical-semantic variable, concreteness, and determines that (i) the size of frequency effect obtained is influenced by the concreteness of the stimuli, and that (ii) these variables appear to behave similarly across serial positions. The architecture of language-based models of STM is argued to be consistent with these findings. A second series of studies considers the influence of item arrangement in lists of mixed frequency and uncovers the presence of directionally-sensitive and non-directional associative effects operating in the early and late serial positions, respectively. These results are also considered to be most compatible with language-based explanations of memory given their capacity to reflect associativities that have developed through natural language use as well as their accommodation of early-stage lexical-semantic influences. However the transformation from directional to non-directional associativity as list recall proceeds requires further research to better articulate the responsible mechanism(s). Possible future avenues of investigation are presented, and the research is discussed with reference to broader theoretical issues (e.g. the separation of item and order mechanisms, unitary versus two-store accounts of short-term memory).

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