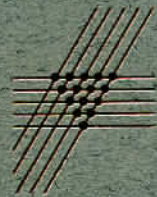


The Beckman Institute for Advanced Science and Technology



**The Effect of Focus on Memory
for Words in Sentences**

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Cognitive Neuroscience
Technical Report UIUC-BI-CNS-94-01

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Abstract

Three experiments investigated the effects of focus on memory for words in written sentences. The effect of focusing phrases, such as *It was the...* and *There was this...* on memory for the focused word and for particular types of information about it (phonological and semantic) was investigated. The results indicated that words were consistently better remembered when they had been focused. Phonological information was found to be better remembered for focused words in a delayed recognition task (Experiment 2) and in a naming task (Experiment 3), but not in an immediate recognition task (Experiment 1). Memory for general semantic information about words was not enhanced by focus in either recognition or naming. The results suggest that focusing a word enhances memory for its specific identity and for its phonological properties, and possibly increases the specificity of memory for its semantic properties.

Successful language comprehension requires the incorporation of each new sentence into an evolving mental representation of the people, places, and things that have been mentioned in the discourse (Johnson-Laird, 1983, 1989; van Dijk & Kintsch, 1983). New sentences are typically connected to earlier sentences through references to previously mentioned entities. For this reason, these entities must remain available in the mental representation so that later references to them can be understood. Thus, language processing makes demands on memory: we must remember something about what has already been said in order to fully understand what is being said.

There is considerable evidence, however, that indicates that people's memory for the details of sentences they hear or read is quite limited (e.g., Bransford & Franks, 1971; Brewer, 1975; Sachs, 1967, 1974). Several studies have shown that while memory for conceptual information is generally quite good, surface information such as syntactic structure (Sachs, 1967) and exact wording (Brewer, 1975) is often less well-remembered. Remembering meaning is probably sufficient for discourse comprehension in most situations, but in some cases it is crucial to remember form, as well. For example, some anaphors require their antecedents to be available in literal form, as in the verb-phrase anaphor in (1) and (2) below (example taken from Johnson-Laird, 1989):

- (1) *The fleas were biting the dogs, and the cats were, too.*
- (2) *The dogs were being bitten by the fleas, and the cats were, too.*

The first clauses of these two sentences have approximately the same meaning but different surface syntactic forms. In order to correctly interpret the verb-phrase anaphor *were, too* in the second clause in each sentence, it is necessary to remember the surface syntactic form of the first clause, not just its meaning. That is, to know what the cats were doing (biting the dogs or being bitten by the fleas), the surface form of the earlier clause must remain available. Indeed, anaphors like these are often called "surface anaphors" (see Hankamer & Sag, 1976; Murphy, 1985; Sag & Hankamer, 1984; and Tanenhaus, Carlson, & Seidenberg, 1985). Surface information from the first clause needs to be retained only briefly in these cases, since the verb-phrase anaphor immediately follows its antecedent. The tendency for surface anaphors to follow their antecedents immediately probably arises from limitations on memory for surface information. Indeed, Murphy (1985) found that a verb-phrase anaphor was understood more slowly when separated from its antecedent by an intervening sentence, indicating that the surface form of the antecedent was no longer readily available.

Malt (1985), however, found that people seem to retain surface information across an intervening sentence when that sentence maintains focus on the antecedent. For example, in Malt's experiment, people read the verb-phrase anaphor in the last sentence in (3) more quickly than in (4).