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Sentence Comprehension in Poor vs. Good Readers: A Cue-Based Retrieval Approach

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Introduction

A distinguishing characteristic of the cue-based retrieval architecture is a highly restricted memory capacity for maintaining active information. This is consistent with research in the memory domain suggesting that retrieval speeds are constant for all information except for a few recent items in attentional focus. This means that normal (skilled) language comprehension requires only minimal memory capacity, with a fast cue-based retrieval process providing the computational power necessary to create dependencies in real time. This contrasts sharply with the predominant view of the memory system that supports language comprehension, which assumes an active memory capacity sizeable enough to be a source of individual differences (e.g., Just & Carpenter, 1992). It also provides a means of resolving the puzzling findings that patients with severely limited working memory spans nevertheless show preserved comprehension of quite complex grammatical constructions (e.g., Caplan & Waters, 1999). Shifting the focus away from capacity and towards retrieval suggests that sources of individual variation in comprehension relate either to differences in the nature or efficiency of the retrieval mechanism and/or in the quality of representations. Examining the first possibility is especially important because evidence supporting cue-based retrieval is entirely based on a population of highly skilled (undergraduate and graduate-level) readers. Our primary goal in the current study is to assess the presence of cue-based retrieval in poor readers.

Methods

Thirty-five young adults (age 16-24) with reading ability ranging from the 2nd grade to the post-graduate level were tested in a Sternberg paradigm using the speed-accuracy tradeoff (SAT) methodology (Wickelgren, 1977), which enables independent assessments of effects due to retrieval speed and representation quality. The top and lower thirds, determined by performance on the PPVT vocabulary assessment, were contrasted.

Results & Discussion

Analyses point to aspects of representation quality, and not differences in the retrieval mechanism, as the distinguishing factor between good and poor readers. Poor quality representations lead to increased sensitivity to interference, due to a reduction in the availability of diagnostic retrieval cues (Oberauer & Kliegl, 2006). Interference effects are a natural implication of the cue-based retrieval architecture, and have been documented in skilled reading comprehension, arising when retrieval cues are insufficient for distinguishing target representations from similar competitors (e.g., Van Dyke & McElree, 2006). We discuss mechanisms leading to increased sensitivity in poor readers and present additional data pointing to representation quality, and not

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memory capacity, as key determinants of comprehension. This work provides an important framework for interpreting acquired comprehension deficits; implications for aphasia research are discussed.

References

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