

Multiple Word Meanings and Semantic
Organization in Aphasia
(Abstract)

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This study was designed to address two major questions related to the organization of semantic information in aphasia. First, we wanted to determine if an important factor in semantic knowledge in aphasia is the number of meanings a word has when frequency of occurrence in the language is controlled. Second, we wanted to use this opportunity to study the level of breakdown of lexical knowledge in aphasia.

Six fluent, six nonfluent, and six non-brain-damaged male adults served as subjects in a lexical decision task. They were required to press a key labeled "yes" as quickly as possible if a string of letters presented on a video monitor was an English word, or a key labeled "no" if it was not a word. A number of studies have shown that the recognition of words in this task requires an individual to use information about the words stored in the underlying semantic organization. The item remained on the screen until the subject responded. Stimuli consisted of 320 letter-strings, half of which were words and half of which were nonwords. Forty real words were selected for each of the four conditions formed by a factorial arrangement of high and low number of dictionary meanings and high and low frequency of occurrence. The mean number of dictionary meanings for the high condition was 36.25 words and 5.51 words for the low condition. There were 15 four-letter, 15 five-letter, and 10 six-letter words in each set of forty words. Nonwords were created by changing a single letter of each of the 160 English words.

An ANOVA on the reaction time data for real word stimuli indicated no significant differences among the groups ($p > .20$), a significant difference between high and low levels of meaning ($P < .001$), a significant difference between high and low levels of frequency of occurrence ($P < .001$), and a significant interaction of number of meanings by frequency of occurrence ($P < .02$). An ANOVA for nonword stimuli revealed no significant main effects or interactions. Analyses of errors showed results similar to the analysis of reaction time. Again, the three groups behaved similarly.

Both high frequency of occurrence and large number of meanings resulted in faster lexical decisions, regardless of subject group. These results argue against interpretations of some current research which have suggested that fluent aphasic patients have a disruption in semantic organization. Some of this research has challenged traditional accounts that naming and comprehension impairments in aphasic patients reflect disturbance at the level of word retrieval. If the underlying semantic organization in fluent aphasic individuals were disrupted, one would expect them to display significant differences from nonfluent aphasic subjects and normal controls in this study.

In addition, the fact that the number-of-meanings effect appears to be an important factor in lexical decisions suggests that homography is an important semantic variable which should be controlled in lexical studies in aphasia. This study shows that failure to control for number of meanings could cause problems for the interpretation of results.