Word Frequency and Semantic Retrieval in Nouns and Verbs

Angela Kim, Alyson D. Abel, Ph.D., Fizza Naqvi, & Mandy J. Maguire, Ph.D.

Developmental Neurolinguistics Lab

UT DALLAS
Callier Center for Communication Disorders

ABSTRACT

Word finding problems are common in a range of language disorders and differences between nouns and verbs in this respect are commonly reported. Yet to date, we know little about how differences in the semantic organization of nouns and verbs affect strategies for word retrieval and if factors like word frequency and sentence constraint differentially affect [1,2,3] noun and verb retrieval. This study used a sentence completion task [2] with sentences differing in constraint for the target words (nouns or verbs). Analyses focused on non-target response words, when correct retrieval failed. Results revealed a difference between nouns and verbs only in the highly constrained sentences for which verb retrieval relied heavily on frequency but in the case of nouns other factors seemed to be driving the non-target responses. Implications for clinical strategies for word finding deficits in people with aphasia will be discussed.

RESEARCH QUESTIONS

1. Do non-target response **nouns** and **verbs** differ in word frequency?
2. Does sentence constraint differentially influence the frequency of non-target **noun** and **verb** retrieval?

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METHODS

Data collection

- Participants: 167 college students
- Sentence completion task:
  - Total number of sentences = 161
  - Lists of 20-25 sentences missing the final word
  - Students asked to fill in the missing word with the one word that best completes the sentence

Table 1. Example Test Sentences (target word in italics)

Constraint Level	Sentence
Nouns	
Low	At lunch she didn't eat her *apple*.
Medium	At the store, buy an *apple*.
High	Snow White snacked on an *apple*.
Verbs	
Low	Her favorite hobby is to *dance*.
Medium	I hope he asks me to *dance*.
High	All ballet students love to *dance*.

Frequency calculations

- Frequencies obtained from English CELEX Lexical Database for each non-target response word [4]

Table 2. Example response words and frequencies

Target word	Response word	Frequency
Apple	Food	296
Apple	Lunch	81
Apple	Sandwich	10
Dance	Run	441
Dance	Read	373
Dance	Paint	72

RESULTS

Research question 1

Do non-target nouns and verbs differ in frequency?

Yes, $F(1,155) = 24.06$, $p < 0.01$
Nouns mean frequency = 144.72
Verbs mean frequency = 423.6

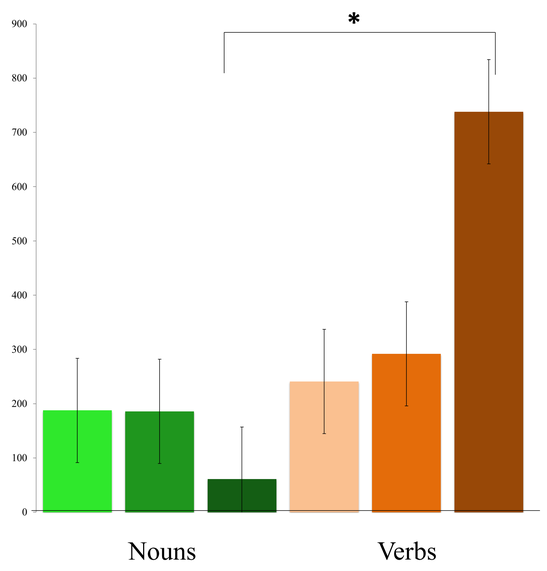
Research question 2

Does sentence constraint differentially influence the frequency of non-target noun and verb retrieval?

Yes, word class x constraint interaction; $F(2,160) = 10.92$, $p < 0.05$

- For high constraint sentences, non-target verbs are higher frequency than non-target nouns; $t(39) = -3.58$, $p < 0.01$

Figure 1. Mean frequencies of non-target responses



SUMMARY OF FINDINGS

Research question 1

Non-target nouns lower in frequency than non-target verbs

Research question 2

Word class by constraint interaction, driven by much higher frequency non-target verbs versus nouns in high constraint sentences

CONCLUSIONS

When unable to retrieve the target word, participants chose lower frequency nouns versus verbs. This indicates that, in noun retrieval, participants are delving deep into semantic memory, while verb retrieval is related to more surface qualities of the word, like frequencies.

This effect was influenced by the amount of semantic constraint provided by the sentence, such that when the sentence was highly constrained but the participant was unable to retrieve the target word, they used different strategies to retrieve alternate noun versus verb responses.

CLINICAL IMPLICATIONS

In treating aphasic adults with word finding difficulties, sentence completion tasks are often used to elicit volitional speech. Sentences with high constraints are first used to elicit fast and accurate responses until the patient can start to respond to low constraint sentences [5]. Although this method seems to help word retrieval in aphasic patients, research supporting this method focused solely on nouns and adjectives as target words. Findings from this study suggest that patients may use different strategies for word finding in verbs.