Why do users neglect suggestions?: Effects of semantic relatedness and task on word recognition

C. L. Smith & N. Wacholder

c.smith; ninwac @ rutgers.edu

We report work in progress on the question “Why do searchers frequently fail to use potentially valuable query suggestions?” [1,2]. We hypothesize that failure is due, at least in part, to interference with the searcher’s ability to recognize a semantic relationship between the words used in a query and the words in a suggestion. In our study, we measure semantic priming as an indicator of a searcher’s recognition of relationships between words. This poster presents preliminary results from one experiment in the study.

1. INTRODUCTION

Generally, our research objective is to investigate people’s recognition of related words in the context of interaction with a search system. More specifically, we are interested in how the tasks of formulating a query or scanning a results page affect recognition. In our broader study, we approach these questions in a series of controlled experiments that isolate effects due to factors such as semantic relatedness, context, and task.

This abstract and the poster are organized as follows. First, we briefly define and describe the principal element of our methodological approach: semantic priming. Next, we describe our baseline study, which uses a standard approach for measuring semantic priming, the lexical decision task. Then, we describe a new experimental approach, which is designed to invoke a decision task that occurs in the course of interactive search. Our poster presents results from an experiment conducted using this new task.

2. SEMANTIC PRIMING

Semantic priming is a well-established, extensively investigated cognitive phenomenon [3]. Psychologists and linguists use measures of semantic priming in a wide range of studies, including areas such as memory, reading, and perception. Semantic priming refers to an increase in the availability of a word in memory, where the increase is caused by the processing of a preceding, semantically related word or other stimuli such as an image. For example, the word kitten “primes” the semantically related word cat; the unrelated word table does not prime cat. The difference in availability is termed the semantic priming effect. There is a large literature on the many factors that affect semantic priming. In our experiments, we manipulate semantic relationships between words, the order of words, and the subject’s task, as independent variables. We measure semantic priming as the dependent variable.

3. BASELINE STUDY

In our baseline experiment, we used a standard methodology for measuring semantic priming: the lexical decision task (LDT). During one iteration of this task, a volunteer sees a sequence of computer screens (see Figure 1). The first screen displays a fixation point, which draws the volunteer’s eye to the center of the screen. Next, a real English word is displayed very briefly (~150 milliseconds); because it is processed first, this word is called the prime. A blank screen then flashes very quickly (~50ms). Finally, a second string of letters is displayed; this string is called the target. The target can be a real English word or a pronounceable non-word. The volunteer must decide very quickly (within 1 second) whether the target is a real English word (the lexical decision). The volunteer indicates the decision by pressing one of two buttons. The time taken to press a button is called the response time (RT).

For each iteration of the task, a volunteer may experience one of three possible target conditions:

- **Related-word**: the target is a real word, and the prime is related to the target
- **Unrelated-word**: the target is a real word, and the prime is unrelated to the target
- **Unrelated-nonword**: the target is a nonword

Our baseline measure of semantic priming compares response times under the related-word and unrelated-word conditions. The semantic priming effect is the difference between mean response times under the two conditions.

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![Figure 1. Sequence of screen displays and response in lexical decision task](image-url)
Baseline results: lexical decision task

![Baseline results chart]

<table>
<thead>
<tr>
<th>Position in Target Display</th>
<th>Bottom String in Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Prime String</td>
<td>Repeated Prime</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Repeated Prime</td>
<td>---</td>
</tr>
<tr>
<td>Related Word</td>
<td>kitten</td>
</tr>
<tr>
<td>Unrelated Word</td>
<td>army</td>
</tr>
<tr>
<td>Bottom String in Target</td>
<td>non-word</td>
</tr>
</tbody>
</table>

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5. REFERENCES