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Evidence from eye movements
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The processing cost of negation in sentence comprehension: Evidence from eye movements

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Introduction

Previous research on negation supports the view that negation involves a processing cost. A good number of studies suggest that any kind of negation adds a processing cost to comprehension. Some even showed that words with negative semantics such as for, a small proportion and forget also take longer to process than affirmativeives (Clark, 1969; Just & Carpenter, 1977). Other studies have presented contrasting results as to whether or not morphological negation adds a processing cost to comprehension (Sherman, 1973, 1976; Hoosain, 1975).

Sherman (1973) in his first study found that negative prefixes are more difficult to process compared to non-negated forms, but that they are not as difficult as negated forms with not. However, in another study (Sherman, 1976), he did not find any cost associated with negated prefixes on their own, but increased processing times were found when these prefixed forms were in the presence of one or two other negatives (multiply negated statements). Hoosain (1976) also tested prefixed negation in his experiment and did not find any significant differences between negatively-prefixed forms and their base forms.

In this study, three forms of negation namely, SENTENTIAL NEGATION (negator nd), PREFIXAL NEGATION (n) and DOUBLE NEGATION (not nd) were compared to the so-called BASE form (with no negation). Comprehension of these negated forms was tested through reading a congruent or incongruent subsequent context while participants’ eye movements were recorded. See the example below:

<table>
<thead>
<tr>
<th>Negation conditions</th>
<th>Contextual manipulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the evidence shows that the fire in the school was intentional/ not intentional/ not intentional/</td>
<td></td>
</tr>
<tr>
<td>the jury will find guilty/ innocent/</td>
<td></td>
</tr>
</tbody>
</table>

The processing cost of negation in sentence comprehension: Evidence from eye movements

25 native speakers of English (16 females, mean age of 27.4, range 21-42)
200 trials: 160 experimental + 40 fillers
45-50 minute task
Sentences accompanied by comprehension questions
Apparatus: EyeLink 1000

Procedure

1. Total dwell time on the contextually manipulated word

2. Probability of regressions back to the negated adjectives

3. Residual first-pass reading times on the negated adjectives

4. Residual second-pass reading times on the negated adjectives

5. Residual Total dwell times on the negated adjectives

Results

Residual Total dwell times on the negated adjectives

- Base: est. = 0.54, SE = 0.11, t = 4.98, p < .001
- not: est. = 0.21, SE = 0.07, t = 4.04, p < .001
- un: est. = 0.45, SE = 0.08, t = 5.45, p < .001

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References