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Predictive pressures do not override the effects of verb bias in syntactic parsing

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INTRODUCTION

Syntactic parsing is sensitive to
• predictive pressures (e.g., to complete an open dependency) [1]
• subcategory frequency information (e.g., how often a given verb takes a direct object vs. a sentential complement, aka verb bias) [2]

Reinterpretation of Past Findings[3-4]

Garden path effects in sentences like (1) were taken
to show reanalysis is the parsers’ last resort [5]
1) “The government officials who accepted (that) the expensive gift had caused a scandal were quick to turn it away.”

But these results may also be taken to show that comprehenders face predictive pressures to complete an open dependency asap (by interpreting “had caused a scandal” as the main clause predicate).

THE PRESENT STUDY

Question: Can the predictive pressure to complete the main clause S-V dependency override the effects of verb bias?

Past findings suggested it cannot [6], but participants may not have pursued a DO reading in SC-biased materials for independent reasons (e.g., implausibility of DO readings).

METHODS

We examined the effects of verb bias x ambiguity in sentences with low vs. high predictive pressures.

Low predictive pressure (Experiment 1A):

DO-bias: The policeman saw (that) the protesters/ had entered/ the plaza/ and was keeping a watchful eye on the situation.

SC-bias: The judge doubted (that) the witnesses/ could resist/ bribery/ and was calling for an investigation.

High predictive pressure (Experiment 1B):

DO-bias: The policeman who saw (that) the protesters/ had entered/ the plaza/ was keeping/ a watchful eye on the situation.

SC-bias: The judge who doubted (that) the witnesses/ could resist/ bribery/ was calling/ for an investigation.

• Experiments 1A & 1B were run in a single session with the same set of participants (n=22; 48 items).
• We quantify verb bias using a SC-DO ratio [6]
  • 12 DO-biased verbs (<0.5), e.g., accept, hear, establish, read
  • 12 SC-biased verbs (>2), e.g., argue, decide, realize, conclude
• The materials were normed to ensure that all readings (SC, DO, high and low attachments) are plausible.

RESULTS

<table>
<thead>
<tr>
<th>Experiment 1A (Low predictive pressure):</th>
<th>Experiment 1B (High predictive pressure):</th>
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<tr>
<td>[Graph showing regression path times and critical region effects]</td>
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| Summary |
| In both experiments, we observed a main effect of ambiguity in the critical region, which was followed by a verb-bias x ambiguity interaction: |
| Exp 1: total time in the critical region + regression path and total time in the post-critical region |
| Exp 2: total time in the critical region |

DISCUSSION

• We replicated Garnsey et al.’s classic findings in eye-tracking in Experiment 1A, which validated our verb bias manipulation.

• The reduced garden-path effect in the SC bias condition in Experiment 1B suggests that comprehenders pursued an SC analysis even when
  i. the DO reading is highly plausible, and
  ii. pursuing a DO analysis would allow them to complete the main clause S-V dependency sooner.

• These results add to recent findings on the limits of predictive processing.[7]

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REFERENCES