Causal priming: How a language production mechanism guides representation

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Questions

- How do people talk about causal events? Do people use language that matches the form of what they’ve recently heard or read? (e.g., Bock, 1986; Sandkull & Laberge, 1978)
- In particular, does local linguistic context influence whether people talk about causal agents?
- We compared people’s event descriptions in agentive and non-agentive linguistic contexts.

Answers

- In both natural dialogue and in an experiment, people were more likely to talk about causal agents after they had recently encountered agentive language than non-agentive language.
- Comprehending different kinds of causal event descriptions changes other behaviors like memory and reasoning (e.g., Fausey & Boroditsky, 2008; Majid et al., 2007). Sensitivity to local linguistic context may be one mechanism that contributes to the production of these descriptions in the first place.

References and Acknowledgements

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Causal Language in the Wild: Corpus Study

Natural spoken language data
- Corpus: Manually-parsed Penn Treebank (800,000 words)
- Tokens: Transitive and intransitive forms of 24 verbs (begin, build, break, burn, change, close, connect, develop, dry, fill, finish, freeze, gather, impact, melt, open, pull, roll, roll, split, spread, stop, turn, wake)
- Data: Total tokens: 817 (72 passive excluded)
- Mean token occurrence per verb: 37.2
- Mean Prime-Target distance: 60.78 turns

Targets: Each token
- Targets and primes coded as agentive or non-agentive
- Targets and primes differed more in agentive primes

Results: Overall trends (statistical analyses considered several additional factors)

<table>
<thead>
<tr>
<th>Prime-Target distance (n=113)</th>
<th>Agentive Prime</th>
<th>Non-agentive Prime</th>
<th>None Prime</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>0.9</td>
<td>0.7</td>
<td>0.8</td>
<td>0.9</td>
</tr>
</tbody>
</table>

How did people talk about causal events?

- When the prime and target verb were the same:
  - Target form depended on prime form ($\chi^2 = 9.79, p < .001$)
  - People were 2.4 times more likely to describe an event agentively after hearing agentive language than after no prime.
  - People were 3.8 times less likely to describe an event agentively after hearing non-agentive language than after no prime.

- When the prime and target verb were different:
  - No effect of prime form

Materials: Linguistic primes
- Agentive:
  - He popped the balloon.
  - He opened the umbrella.
  - He unfastened the necklace.
  - He blew out the match.
- Non-agentive:
  - The balloon popped.
  - The umbrella opened.
  - The necklace unfastened.
  - The match blew out.

Design

Participants and Experimental Task
- 338 UC Merced students completed a 2-sided survey
- Front: Participants read a sentence and were asked to continue the story for a few more sentences
- Back: Participants saw start and end pictures of an event and were asked to describe what happened

Results

- People were more likely to describe an event agentively after reading agentive language than either non-agentive or no language ($\chi^2 = 9.79, p < .002$; $\chi^2 = 6.36, p < .012$).
- These effects occurred even when the verbs in prime and target descriptions differed.

Materials: Pictured events
- Agentive:
  - Somebody broke the vase.
  - Somebody took the paint and splattered it on the wall.
  - Somebody threw the vase on the floor.
- Non-agentive:
  - The pretty antique vase broke and shattered into pieces.
  - The paint was in the buckets then it spilled onto the wall.

How did people talk about causal events?

- Event descriptions depended on the prime form
- People were more likely to describe an event agentively after reading agentive language than either non-agentive or no language ($\chi^2 = 9.79, p < .002$; $\chi^2 = 6.36, p < .012$).