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Citation for published version:
Rohde, H & Kehler, A 2008, "Demanding an Explanation: Implicit Causality Biases in Discourse Interpretation" CUNY 2008, South Carolina, United States, 13/03/08 - 15/03/08.

Link:
Link to publication record in Edinburgh Research Explorer

Document Version:
Peer reviewed version

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Demanding an Explanation: Implicit Causality Biases in Discourse Interpretation
Hannah Rohde & Andrew Kehler

Abstract

Distinguishing (i) next mention biases and (ii) biases toward upcoming coherence relations.

2. Previous work on Implicit Causality

Passage completions: strong IC bias to particular referent with 'because' prompt (Caramazza, Grober, Garvey, Yates 1974; McKoon, Greene, Ratcliff 1993) (inter alia)
(1) a. IC-1 John annoyed Mary because ____________ . [bias to NP1-John]
   b. IC-2 John scolded Mary because ____________ . [bias to NP2 Mary]
   c. Non-IC John babysat Mary because ____________ . [mixed biases]

However, next-mention bias reduced/eliminated with full-stop prompt (Au 1986, inter alia)
(2) a. IC-1 John annoyed Mary ____________ .
   b. IC-2 John scolded Mary ____________ . [mixed biases]
   c. Non-IC John babysat Mary.

What role of 'because'?
- Modifying salience of event participants directly (Stevenson, Knott, Overlander, & McDonald 2000)
- Signaling an Explanation coherence relation (Hobbs 1979, Kehler 2002)

3. Using coherence to modulate next-mention biases

We generalize Rohde, Kehler, & Elman's (2007) pronoun model to next mention: Biases towards upcoming coherence relations (CRs) combine with biases for which event participant will be mentioned again, conditioned on coherence

4. Story continuation experiment

2 x 3 design: verb type (IC vs. Non-IC) x continuation type (full stop vs. because vs. dialog prompt – dialog results not discussed here)

Task: construct natural continuation to context sentence and prompt

Materials: 40 IC verbs (20 IC-1, 20 IC-2) and 40 Non-IC verbs

Evaluation: judges annotated for next mention & coherence relation

Results: By categorizing responses by coherence relation, we localize the previously reported IC bias to Explanation relations. We find an additional IC bias concerning P(Explanation).

Prompt: 'because'
Prompt: full stop

IC verbs yield more Explanation continuations than do Non-IC verbs

6. IC-1 Results

Next-mention biases were statistically indistinguishable when only 'because' prompts and freely generated Explanations were considered (F(1,70) = 0.221, p = 0.6822; F(1,19) = 0.032, p = 0.86)

7. IC-2 Results

Again, next-mention biases statistically indistinguishable when only Explanations are considered 'because' or freely generated (F(1,61) = 1, p = 0.982; F(1,36) = 1.4598, p = 0.2348.)

6. IC-1 Results

Next-mention biases were statistically indistinguishable when only 'because' prompts and freely generated Explanations were considered (F(1,70) = 0.221, p = 0.6822; F(1,19) = 0.032, p = 0.86)

7. IC-2 Results

Again, next-mention biases statistically indistinguishable when only Explanations are considered 'because' or freely generated (F(1,61) = 1, p = 0.982; F(1,36) = 1.4598, p = 0.2348.)

9. A new IC bias

IC verbs create an expectation regarding the direction the discourse is likely to take – specifically a bias towards an upcoming Explanation

Findings for full stop prompt: IC verbs yield more Explanation continuations than do Non-IC verbs

10. Conclusions

Like Rohde et al.'s results, overall statistics conceal a consistent system of stronger biases once coherence relations are conditioned on.

In contrast to previous results:
- Connective alone does not affect referent salience – mediated by coherence
- There are actually two strong biases that differentiate IC and Non-IC verbs: P(CR = Explanation) is high for IC-1 and IC-2

The presence of a second bias had gone unnoticed because previous studies had not categorized their data by coherence.

References


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