"Demanding an Explanation: Implicit Causality Biases in Discourse Interpretation"

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

Publisher Rights Statement:

General rights
Copyright for the publications made accessible via the Edinburgh Research Explorer is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy
The University of Edinburgh has made every reasonable effort to ensure that Edinburgh Research Explorer content complies with UK legislation. If you believe that the public display of this file breaches copyright please contact openaccess@ed.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.
Demanding an Explanation: Implicit Causality Biases in Discourse Interpretation
Hannah Rohde & Andrew Kehler

Abstract

Problem: Previous passage-completion studies report strong biases regarding who will be mentioned next following implicit causality (IC) verbs with a ‘because’ prompt. However, these biases are reduced/eliminated with a full-stop prompt.

(1) a. John scolded Mary because __________________ . [strong bias to Mary]
    b. John scolded Mary. __________________ . [mixed biases]

Proposal: In light of recent results showing two types of coherence-driven expectations in prior interpretation, we compare responses to contexts like (1a-b). We predict that IC biases depend both on expectations about upcoming continuation types (P(coherence)) and on biases for which event participant will be mentioned again conditioned on continuation type (P(because) for coherence).

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). This bias has gone unnoticed because previous work has not categorized responses by coherence.

To clarify the effects of IC biases on discourse interpretation by distinguishing (i) next mention biases and (ii) biases toward upcoming coherence relations.

1. Goal

2. Previous work on Implicit Causality

Passage completions: strong IC bias to particular referent with ‘because’ prompt (Caramazza, Grober, Garey, 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. __________________ . [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 __________________ . [bias to NP1 'John']
    b. IC-2 John scolded Mary. __________________ . [bias to NP2 'Mary']
    c. Non-IC John babysat Mary. __________________ . [mixed biases]

3. Using coherence to mode 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

(3) P(next_mention = referent) = \sum_{CR} P(CR) \cdot P(next_mention = referent | CR)

What is role of ‘because’?

• Modifying salience of event participants directly (Stevenson, Knott, Overland, & McDonald 2000)
• Signaling an Explanation coherence relation (Hobs 1979, Kehler 2002)

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

Next-mention biases were statistically indistinguishable when only ‘because’ prompts and freely generated Explanations were considered

(F(1,70) = 0.4424, p<0.7581; F(1,19) = 1.2235; p<0.2825)

Because next-mention biases statistically indistinguishable when only Explanations are considered (because or freely generated)

(F(1,61) = 0.56; p<0.778; F(1,36) = 1.4598, p<0.2348)

P(next_mention = NP1 | ‘because’) ≈ p(next_mention = NP1 | Explanation)

5. IC-1 Results

P(Subject)  Exp  Res  Elab  Odds  N
Because  85  84  1.0  65
Exp 56 24 58 53 40

6. IC-2 Results

P(Subject)  Exp  Res  Elab  Odds  N
Because  15  10  0.6  9
Exp 40 24 58 53 40

7. Non-IC Results

8. Non-IC Results

Again, next-mention biases statistically indistinguishable when only Explanations are considered (because or freely generated)

(F(1,19)=1.0, p<0.382; F(1,36)=1.532; p<0.2348)

Exp 56 24 58 53 40

P(next_mention = NP1 | ‘because’) ≈ p(next_mention = NP1 | Explanation)

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(Explanation = IC) is high for IC-1 and IC-2

P(next_mention = NP1 | Explanation) is high for IC-1 and low for IC-2

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

References

As, T. K., (1994) A verb is worth a thousand words: The causes and consequences of interpersonal events implicit in language. Journal of Memory and Language 30:1, 59–120.


Contact: hannah@ling.ucsd.edu