Prosodic distance iconically disrupts causal inferencing
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Introduction

- Discourse permits the inference of different relations between segments (e.g., Asher & Lascarides 2003; Kehler 2002).
- Causal relations are argued to hold by default (Sanders, 2005); underspecified and allows for a causal interpretation via enrichment (Grice 1975; cf. Txurruka 2003).
- Consider a sentence like (1):

  (1) The newspaper reported [that the mayor was elected] and [(that) there was a riot].

- Bjorkman (2010, 2013) suggested that the two conjoined clauses were more likely to be causally related (the election caused the riot) without the second complementizer.
- H. Rohde, Tyler, & Carlson (in press) supported this using forced-choice studies of written sentences, though the effects were small and elusive (not categorical).

- Bjorkman's Syntactic Hypothesis: the conjoined CP structure mandated by the second that allows the non-causal interpretation, while conjoined IPs do not.
- Iconic Hypothesis: the second that helps the non-causal interpretation by adding distance between the conjoined clauses, which a prosodic boundary could also do.
- Predictions: The Iconic Hypothesis predicts that a prosodic boundary should function like that in favoring a non-causal interpretation, while Bjorkman's hypothesis doesn't.

Experiment

- Four prosodic/lexical conditions, varying presence of a prosodic boundary and presence of the second that, were recorded and checked.

  (2) the 4 conditions
  
  a. The newspaper reported ip that the mayor was elected and there was a riot.
  b. The newspaper reported ip that the mayor was elected IPh and there was a riot.
  c. The newspaper reported ip that the mayor was elected and that there was a riot.
  d. The newspaper reported ip that the mayor was elected IPh and that there was a riot.

- 24 sentences, presented in pairs of conditions for comparison.

  (3) the pairings we tested
  
  a. [No That, No Break] vs. b. [No That, With Break]: test for effect of break
  b. [No That, No Break] vs. c. [With That, No Break]: test for effect of that
  c. [No That, With Break] vs. d. [With That, With Break]: test for effect of given break
  d. [With That, No Break] vs. d. [With That, With Break]: test for effect of break given that

- Each pair of sentences was preceded by a question about causality:

  (4) Which of the recorded sentences is more likely to mean that the mayor's election caused the riot?

- 63 participants recruited through Amazon Mechanical Turk. Auditory comprehension experiment also contained 66 filler sentences of several types for a total of 90 stimuli.

Results

- The two pairings testing that showed no significant preferences.
- The two pairings testing the effect of a prosodic break did show a significant preference for the versions without breaks as more causal. (no vs. break pair: β = .459, p<.01, and that vs. that-break pair: β = .382, p<.01).

  In these auditory stimuli, the complementizer went by very quickly, with an average duration of 142 ms.

  However, a follow-up experiment varying the rhythm of the final clause so as to mildly accent that did not show significant results (of that or prosodic breaks).

Discussion and Conclusions

- A prosodic boundary between the two conjoined clauses did reduce causal interpretations, supporting the Iconic Hypothesis. On a purely syntactic explanation for that-effects, there is no reason to expect this result.

- In this auditory study, we did not replicate the finding of the second that also reducing causal linking of the clauses. This is disappointing but not unexpected, given the elusiveness of the effects of that.

- Ultimately, we do believe that the Iconic Hypothesis explains both types of effects. A forward causal relationship between the conjoined clauses seems to be the default (A and B interpreted as A caused B), and breaking up the clauses by adding that or a prosodic boundary makes that less likely.

- It would be interesting to find out whether the second that reactivates the earlier sentence complement verb (i.e. reported in (1)) and thus partly functions to disrupt causal inferencing by linking each clause to the earlier verb.

- We find it interesting how these small syntactic or prosodic elements can affect discourse inferences and disrupt natural assumptions of causality.

References


Rohde, Hannah, Joseph C. Tyler, & Katy Carlson. in press. Form and function: Optional complementizers reduce causal inferences. Glossa.