

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

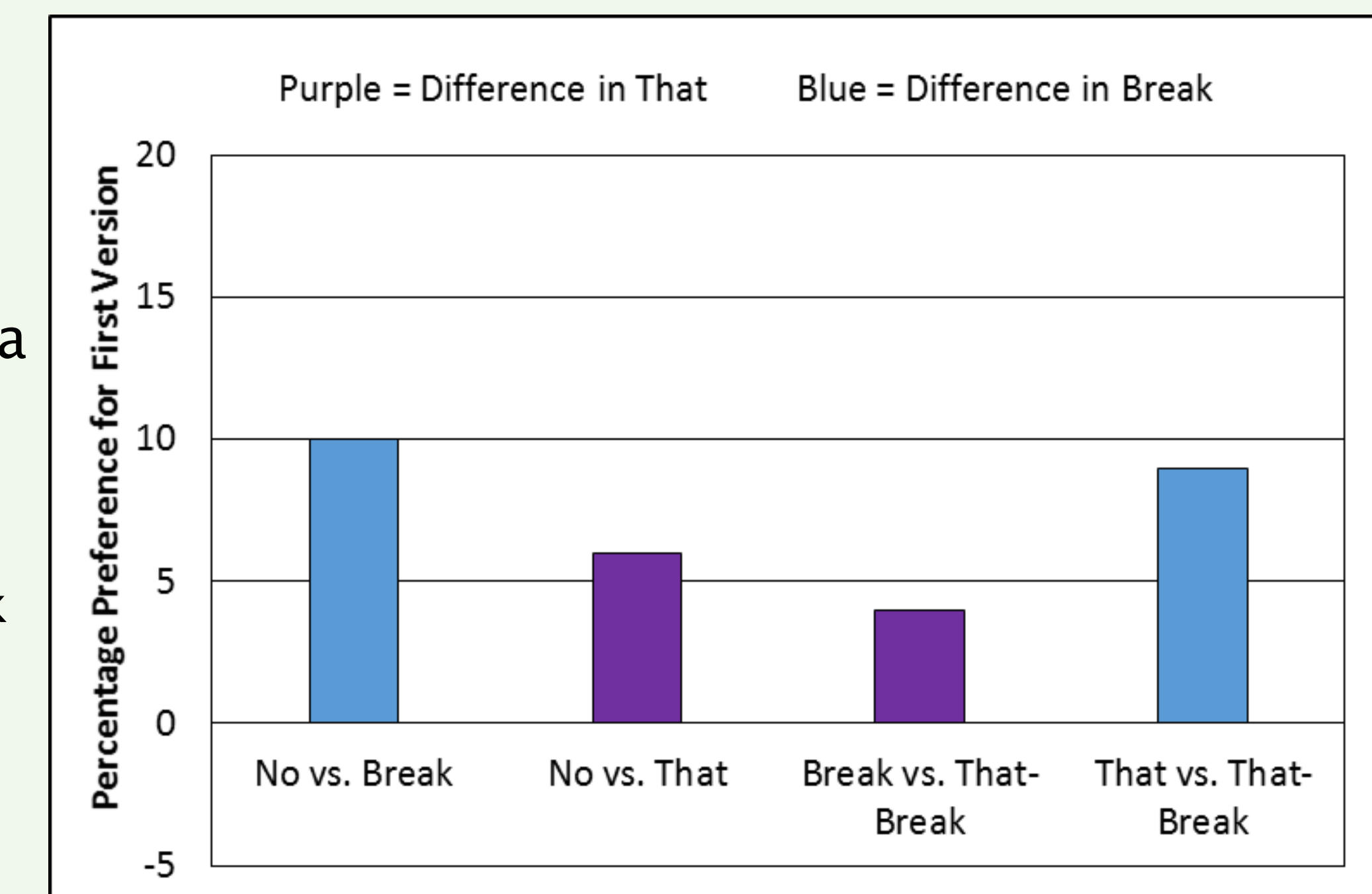
- Four prosodic/lexical conditions, varying presence of a prosodic boundary and presence of the second *that*, were recorded and checked.
(2) the 4 conditions
a. The newspaper reported ip that the mayor was elected and there was a riot.
b. The newspaper reported ip that the mayor was elected **IPh** 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
a. [No That, No Break] vs. c. [**With That**, No Break]: test for effect of *that*
b. [No That, **With Break**] vs. d. [**With That**, **With Break**]: test for effect of *that* given break
c. [**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.

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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: $\beta=.459$, $p<.01$, and *that* vs. *that*-break pair: $\beta=.382$, $p<.01$).
- 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

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