

The role of implicit causality, givenness, and newness in next-mention biases  
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Research shows that next-mention biases, i.e., the likelihood that a referent will be mentioned next, are affected by implicit causality (IC). For example, in the fragment “Peter fascinated Mary because...” the NP1 biased verb ‘to fascinate’ increases the chances of *he* re-mentions, since *Peter* encodes the event cause, while in the fragment “Mary appreciated Peter because...” the NP2 biased verb ‘to appreciate’ increases the chances of *she/Mary* re-mentions (Garvey et al., 1974). Furthermore, next-mention biases have been said to correlate with referent accessibility (Arnold, 2001); and both topicality-related factors (givenness, pronominalisation, subjecthood) and focus-related factors (focus of clefts) influence that accessibility. However, the extent to which these factors and implicit causality *simultaneously* affect next-mention biases in context has been less explored.

We investigated the joint role of IC, topicality- and focus-related factors (operationalized as givenness and newness, respectively) in next-mention biases in English. To this end, we used two sets of completion tasks, each set consisting of a sentence completion task and a dialogue completion task. The first set was created to look only at the effects of givenness and newness, therefore it was designed with non-IC verbs. The sentence completion tasks, which helped us understand the role of the presence of broader context, included fragments with the structure *Name verb Name because...* (Table 1), while the dialogue completion tasks included dialogues with four turns with the following properties: turns 1 to 3 shared the same topic, then at the end of turn 3 a new character was introduced, finally, in turn 4 we either repeated the topic of turns 1 to 3 (conditions 1, 3 and 5 in Tables 2 and 3) or we repeated the newly introduced entity (conditions 2, 4 and 6 in Tables 2 and 3). The structure of turn 4 was also *Name verb Name because....*

A total of 182 participants completed the tasks. For the analyses we performed two mixed effects logistic regression models, one for each set of experiments. The non-IC model included subject continuation (with 3SG pronoun or name) as the dependent variable and condition (isolated sentence vs. discourse-given vs. discourse-new) as the independent variable. The IC model included cause continuations (with 3SG pronoun or name) as the dependent variable and condition and verb bias (NP1 vs. NP2) as independent variables. The non-IC model revealed significantly more subject continuations in both the isolated sentence ( $p < 0.001$ ) and in the discourse-new conditions than in the discourse-given condition ( $p < 0.001$ ), as shown in Figure 1. The IC model revealed an interaction between condition and verb bias ( $p < 0.001$ ). Pairwise analyses revealed that for NP1 verbs (left side Figure 2), there were significantly more cause continuations in the isolated sentence and the discourse-new conditions (where the cause was newer) than in the discourse-given condition (where the cause was given) ( $p < 0.001$ ). Notably, in the latter condition, the effect of IC was almost neutralized with continuations close to chance level. For NP2 verbs (right side Figure 2), there were significantly less cause continuations in the discourse-new condition (where the cause is given) than in the discourse-given (where the cause is newer) ( $p = 0.002$ ) and isolated sentence conditions ( $p < 0.001$ ).

Overall, our results supported newness rather than givenness as the stronger factor influencing next-mention biases in non-biased and IC biased contexts. Additionally, we saw that co-reference preferences differ between isolated sentences and broader contexts. These findings provide insight into the interaction and competition of factors that affect next-mention biases separately.

## References

- Arnold, J. E. (2001). The effect of thematic roles on pronoun use and frequency of reference continuation. *Discourse Processes*, 31(2), 137–162.
- Garvey, C., Caramazza, A., & Yates, J. (1974). Factors influencing assignment of pronoun antecedents. *Cognition*, 3(3), 227–243.

## Tables and figures

Table 1: Example of items in the sentence completion tasks with non-IC and IC verbs

Zachary saw Sofia because... (non-IC)
Peter fascinated Mary because... (NP1 verb)
Veronica appreciated Patrick because... (NP2 verb)

Table 2: Example of items in the dialogue completion task with non-IC verbs

Turn 1 - Speaker A: Peter invited Bill to a party on Saturday.
Turn 2 - Speaker B: Yes, he celebrated his birthday. Did he invite someone else?
Turn 3 - Speaker A: He also invited Mary.
Condition 1 - Turn 4 - Speaker B: Yeah, he saw her because... (non-IC verb)
Condition 2 - Turn 4 - Speaker B: Yeah, she saw him because... (non-IC verb)

Table 3: Example of items in the dialogue completion task with IC verbs

Turn 1 - Speaker A: Peter invited Bill to a party on Saturday.
Turn 2 - Speaker B: Yes, he celebrated his birthday. Did he invite someone else?
Turn 3 - Speaker A: He also invited Mary.
Condition 3 - Turn 4 - Speaker B: Yeah, he fascinated her because... (NP1 verb)
Condition 4 - Turn 4 - Speaker B: Yeah, she fascinated him because... (NP1 verb)
Condition 5 - Turn 4 - Speaker B: Yeah, he appreciated her because... (NP2 verb)
Condition 6 - Turn 4 - Speaker B: Yeah, she appreciated him because... (NP2 verb)

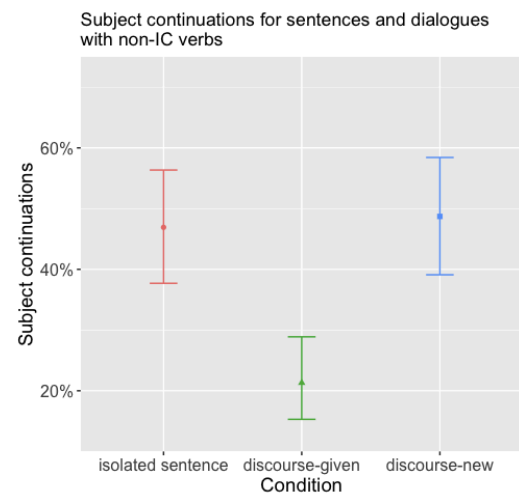


Figure 1: Predicted values given item Condition in the model predicting subject responses to sentences and dialogues with non-IC verbs. Error bars represent confidence intervals

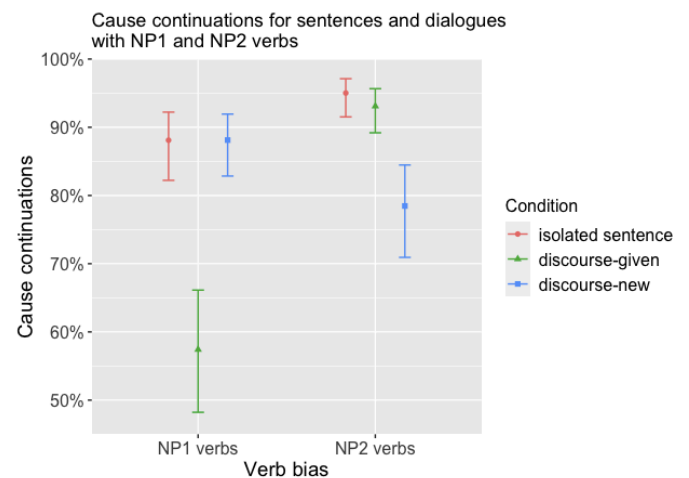


Figure 2: Predicted values given the interaction between item Condition and Verb bias in the model predicting cause responses to sentences and dialogues with IC verbs. Error bars represent confidence intervals