The interplay between given and new status with implicit causality in dialogue reading

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Research suggests that grammatical role, information status (given vs. new) and the form (names vs. pronouns) of potential antecedents affect pronoun processing (Kaiser, 2011; Hert et al., 2024), suggesting that people use information from various sources simultaneously in real-time to establish co-referential relationships. At the same time, implicit causality (IC), a verb-based semantic bias, has been shown to influence co-reference processing (Koorneef & van Berkum, 2006). However, it is not clear whether people follow information status or IC information when the two factors are present at the same time. Using two self-paced reading tasks, we asked whether information status (IS: given, new) interacts with implicit causality in the comprehension of dialogues in English, which properly license IS manipulations.

The experimental items had the following properties: each dialogue had four turns, in turns 1 to 3 the same topic was repeated (given information); then, at the end of turn 3 a new character was introduced (new information); lastly, in turn 4, which consisted of a main and a causal subordinate clause, we manipulated whether the subject of each clause co-referred with the topic of turns 1 to 3 or with the new character of turn 4 (Table 1, items segmented as marked). Experiment 1 investigated solely the role of given and new information without semantic bias, therefore items included non-IC verbs in turn 4. The interaction between IS and IC was investigated in Experiment 2 where IC verbs were used.

A total of 38 participants participated in Exp. 1, while 57 participants participated in Exp. 2. We used linear-mixed models to analyze the reading times (RTs) obtained in each segment of the last turn. The models for dialogues with non-IC verbs included log-transformed RTs as the dependent variable and information status of the main clause subject (new/given), co-reference between main and subordinate subjects (yes/no), trial number, and previous segment RT as independent variables, as well as random intercepts for subject and item. The models for dialogues with IC verbs had the same structure with the addition of verb bias (NP1/ NP2) as independent variable. Both experiments showed significant differences across manipulated conditions in the post-pronoun spill over segment, underlined in (1-3). In Exp-1, faster RTs occurred in the ‘main-given, subordinate-new’ (Cond 2 in Example 1) than in the ‘main-new, subordinate-given’ condition (Cond 3 in Example 2) (labels a vs. b Fig. 2, $p=0.002$), suggesting that in non-IC contexts, the initial integration of given information followed by the integration of new information in the subordinate clause is easier to process.

In Exp-2, faster RTs were found in the ‘main new, subordinate given’ condition with NP1 verbs (when IC bias favoured new information in the subject position of the main clause, Cond. 7 in Example 2) than in the ‘main given, subordinate given’ and the ‘main given, subordinate new’ conditions with NP2 verbs (when IC bias favoured new information in the object position of the main clause, Conds. 9 and 10 in Example 3) (labels a vs. bc, and a vs. c in Fig 2, $p=0.01$). These results revealed that the easiest condition to process was the one where implicit causality bias favoured new entities re-mentioned in the subject position of the main clause rather than in the object position. Notably, in this condition the subordinate subject violated the expected bias from the IC verb, i.e., the semantically biased main subject was not re-mentioned as the subject of the subordinate clause, suggesting potentially greater sensitivity to antecedents’ information status than to implicit causality bias.

In summary, our study shows that retrieval of new, rather than of given information tends to be processed faster when it is favoured by implicit causality, and it is placed in subject position. Furthermore, more research needs to be done on the joint role of information status and IC since they seem to impact co-reference to different extents when they interact.

References

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(1) Example of dialogues with non-IC verbs
a. Speaker A: || Peter called || Bill || last Sunday. ||
b. Speaker B: || Yes, || he wanted to talk || with all || his siblings. || Did he call || someone else? ||
c. Speaker A: || He also called || Emma.
Cond. 1 Speaker B: || Yeah, || he (old) contacted || her || because || he (old) desperately || needed help || with a party.
Cond. 2 Speaker B: || Yeah, || he (old) contacted || her || because || she (new) desperately || needed help || with a party.
Cond. 3 Speaker B: || Yeah, || he (old) desperately || needed help || with a party.
Cond. 4 Speaker B: || Yeah, || she (new) contacted || him || because || she (new) desperately || needed help || with a party.

(2) Example of dialogues with NP1 verbs
a. Speaker A: || Peter called || Bill || last Sunday. ||
b. Speaker B: || Yes, || he wanted to talk || with all || his siblings. || Did he call || someone else? ||
c. Speaker A: || He also called || Emma.
Cond. 5 Speaker B: || Yeah, || he (old) fascinated (NP1) || her (new) || because || he (old) desperately || needed help || with a party.
Cond. 6 Speaker B: || Yeah, || he (old) fascinated (NP1) || her (new) || because || she (new) desperately || needed help || with a party.
Cond.7 Speaker B: || Yeah, || she (new) fascinated (NP1) || him (old) || because || he (old) desperately || needed help || with a party.
Cond. 8 Speaker B: || Yeah, || she (new) fascinated (NP1) || him (old) || because || she (new) desperately || needed help || with a party.

(3) Example of dialogues with NP2 verbs
a. Speaker A: || Peter called || Bill || last Sunday. ||
b. Speaker B: || Yes, || he wanted to talk || with all || his siblings. || Did he call || someone else? ||
c. Speaker A: || He also called || Emma.
Cond. 9 Speaker B: || Yeah, || he (old) envied (NP2) || her (new) || because || he (old) desperately || needed help || with a party.
Cond. 10 Speaker B: || Yeah, || he (old) envied (NP2) || her (new) || because || she (new) desperately || needed help || with a party.
Cond. 11 Speaker B: || Yeah, || she (new) envied (NP2) || him (old) || because || he (old) desperately || needed help || with a party.
Cond. 12 Speaker B: || Yeah, || she (new) envied (NP2) || him (old) || because || she (new) desperately || needed help || with a party.