

Perspective Reasoning as a Determinant of Entities' Prominence in Discourse

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Models of pronoun interpretation use the notion of prominence to explain differences in the accessibility of candidate antecedents. Factors influencing relative prominence range from structural cues (subjecthood, order-of-mention) to lexico-semantic cues (e.g., a verb's implicit causality) to discourse-level factors such as an utterance's narrative role in relation to preceding context (coherence relations) [1, 2]. The present work explores the nuanced ways in which perspectival reasoning determines the prominence of potential referents for a pronoun, using four antecedent judgement experiments [cf. 3, 4].

Study 1 ($N_{ppts}=54$) assessed judgements for antecedents of ambiguous pronouns using sentences like (1a-b). There were 24 critical and 24 filler items. Intuitively, a character telling an interlocutor the information expressed in the subordinate clause should lead readers to interpret a pronoun as coreferring with the main-clause subject, whereas asking should entail main-clause object selections. The results strongly supported this intuition: Readers selected the subject 99.8% of the time in *tell* and the object 99.7% of the time in *ask*, with no order-of-mention bias (which would predict stronger effects for *tell*, where the antecedent is the first-mentioned character). But do the patterns show genuine reasoning, or do they demonstrate shallow pragmatic biases linked to *tell/ask*? A corpus study tagging the construction CHARACTER1 [ASKED/TOLD] CHARACTER2 COMPLEMENT PRONOUN in a large fiction corpus [5] yielded 73.94% subject selections in *tell* cases and 88.45% object in *ask* cases (via two annotators, 3295 tokens), a clear departure from Study 1's near-categorical results. Further, cases where subordinate clauses contained modal verbs of possibility/permission (e.g., *should*, *could*) reduced selections to 56.71% and 72.8% respectively, suggesting the main verb is not solely responsible for these patterns.

Accordingly, **Study 2** ($N_{ppts}=60$) manipulated subordinate clause content to include modal verbs to assess if readers will override the patterns found in Study 1. There were 48 critical and 24 filler items. Half the critical items contained the modal verbs *should* and *could* to create scenarios of possibility/permission ("possibility" condition, 2c-d), and the other half were the critical items from Study 1 ("knowledge transfer" condition, 2a-b). The *ask/tell* manipulation was retained, entailing four conditions (participants saw half of each type of sentence for a total of 24 critical items). Responses for the knowledge transfer condition replicated Study 1 (99.4% subject selections for *tell*, 99.4% object for *ask*), but the possibility condition showed markedly different patterns of 4.18% subject for *tell* and 8.61% object for *ask*. Generalized linear mixed-effects modelling showed a significant interaction between main verb and sentence type, where readers selected the subject antecedent less in the *tell*-possibility cases but more in the *ask*-possibility cases (compared to knowledge transfer cases, $\beta = -4.84$, $SE = 0.39$, $z = -12.44$, $p < .001$). Thus, the subordinate clause information effectively "switched" the preferences from Study 1, demonstrating that the patterns are not solely driven by the main verb.

Study 3 ($N_{ppts}=60$) provided further nuance by including a context sentence containing information that, critically, could also shift Study 1's patterns ("shifting" condition, 3a-b). A "neutral context" condition, which should preserve the patterns, was also included (3c). There were 20 critical and 24 filler items. In the shifting context cases, readers again reversed the preferences shown earlier, selecting object antecedents 77% of the time for *tell* cases and subject antecedents 68% of the time for *ask* cases (neutral: 5.3% for *tell*, 10% for *ask*). This provides more evidence that Study 1's patterns are not solely due to the main verbs *tell/ask*, but reflect deeper forms of situation-specific perspectival reasoning.

Study 4 ($N_{ppts}=60$) explored if Study 3's patterns occur spontaneously within standalone sentences where the critical cues occur intrasententially (and are not drawn from a situation model generated from a previous sentence). There were 24 critical and 24 filler items. We kept the main verb constant (*ask*) and manipulated a single word specifying the role of the object antecedent. E.g., in (4a, "neutral"), Max is likely asking if the addressee (his son) understood an assignment, yet in (4b, "shifting"), Max is more likely asking the addressee (his tutor) about himself, as a tutor would hold relevant expertise for the judgement at hand. In neutral cases, readers had 87.5% object selections. However, in shifting cases, readers preferred subject antecedents 85.8% of the time, again showing a reversal from Study 1's patterns, underscoring that the effects are not verb-driven, and that readers make rational inferences from information available to them. Taken together, these studies highlight how the prominence of antecedents is driven by sophisticated reasoning involving calculations of entities' perspectives.

Example Sentences:

(1) Study 1

1a. Madeline told Anna that she remembers when the lecture starts.

Results: 99.8% subject antecedent selections

1b. Madeline asked Anna if she remembers when the lecture starts.

0.2% subject antecedent selections

(2) Study 2

Knowledge transfer (same sentences as Study 1)

2a. Madeline told Anna that she remembers when the lecture starts.

99.4% subject antecedent selections

2b. Madeline asked Anna if she remembers when the lecture starts.

0.6% subject antecedent selections

Possibility/permission

2c. Stella told Emily that she could have another slice of cake.

4.18% subject antecedent selections

2d. Stella asked Emily if she could have another slice of cake.

91.4% subject antecedent selections

(3) Study 3

3a. Molly, a tour guide, was talking to Hana, who is unfamiliar with Japanese currency.

Molly told Hana that she had enough cash to buy a sandwich. **[shifting-tell]**

33% subject antecedent selections

3b. Molly, who is unfamiliar with Japanese currency, was talking to her tour guide, Hana.

Molly asked Hana if she had enough cash to buy a sandwich. **[shifting-ask]**

68% subject antecedent selections

3c. Molly, who noticed it was almost 12:30 PM, was walking with her good friend Hana.

Molly [told/asked] Hana [that/if] she had enough cash to buy a sandwich. **[neutral]**

94.7% (tell), 10% (ask) subject antecedent selections

(4) Study 4

4a. Max asked his son Gerald if he understood the assignment correctly. **[neutral]**

12.5% subject antecedent selections

4b. Max asked his tutor Gerald if he understood the assignment correctly. **[shifting]**

85.8% subject antecedent selections

References:

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