

Similar discourse properties guide both topicality & referential predictability judgments

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Several theories of referential comprehension suggest that referential predictability (who is likely to be mentioned next) guides pronoun comprehension (Arnold, 2010; Hartshorne et al., 2015; Kehler & Rohde, 2013). What is unknown is whether referential predictability is conditioned by topicality. While topicality is notoriously difficult to define, it is generally agreed that the subject position is highly topical (Chafe, 1976, Givón, 1981). However, subjects may also be predictable, in that they are frequently re-mentioned (Arnold, 2010). Thus, either topicality or predictability could explain the tendency for listeners to link pronouns to the previous subject. For example in *Ana is cleaning up with Liz. She needs the broom*, people tend to assume Ana needs the broom (Arnold et al. 2018). Yet models disagree about the relation between predictability and topicality. Kehler & Rhode (2013) suggest that they are not related, and topicality only affects the appropriateness of a pronoun. By contrast, other models suggest that topical referents tend to be predictable (Arnold, 2010; Givón, 1983; Prince, 1981). Here we test whether judgments about topicality and predictability are driven by the same contextual properties, and in particular whether the subject position is both topical and predictable.

While reference expectation is modulated by verb type (Rohde & Kehler, 2014), we focus on the “X is doing something with Y” construction, which has a strong subject bias. We ask how judgments about topicality and predictability are influenced by three properties known to affect pronoun comprehension: 1) subjecthood, 2) gaze, and 3) print exposure. In stories like the example above, listeners tend to pick the subject as the referent for the pronoun, but this effect is strongest for individuals with high print exposure (Arnold et al., 2018), and is modulated by gaze cues (Nappa & Arnold, 2014). Here we asked 1) does referential predictability pattern with judgments of topicality, and 2) do either follow the same constraints as pronoun comprehension.

Methods. Amazon MTurk participants viewed videos of an animated narrator saying the beginning of a story (*Ana is cleaning up with Liz*) with pictures of the two characters, and a central object (Fig.1). After the sentence, the narrator gazed at the subject, non-subject, or neutral center; then the video ended. Participants were asked a metacognitive judgment. Exp.1 asked about referential predictions: “Think about the **next sentence** in this story. Who do you think will be mentioned?” (forced choice: Ana / Liz). Exp.2 asked about topicality: “Who do you think is the **main character** of this story?” (forced choice: Ana / Liz). 9 targets were mixed with 9 fillers; 64 participants in each experiment. The Author Recognition Task was used to measure print exposure (Stanovich & West, 1989). Analyses used multilevel logistic regressions.

Results. Exp.1 – Predictability judgments (Fig.2): There was an overall subject bias ($p=0.0002$) and an overall gaze bias (subject: $p=0.0003$, non-subject: $p=0.0046$), patterning with pronoun comprehension. ART scores, however, followed a different pattern than pronoun comprehension: they correlated with a stronger gaze effect (Fig.3), as shown by an interaction $ART \times \text{gaze to subject}$ ($p=0.026$), and marginal $ART \times \text{gaze to non-subject}$ ($p=0.078$).

Exp.2 – Topicality judgments (Fig.4): There was an overall subject bias ($p<.0001$), and a print exposure effect such that participants with higher ART scores were more likely to choose the subject when asked about the main character (Fig.5). Both of these effects pattern with pronoun comprehension; however, there was no gaze effect, unlike pronoun comprehension.

Conclusions. Judgments about both predictability and topicality followed a strong subject bias. This broadly supports models in which predictability underlies pronoun comprehension (Arnold, 2010; Hartshorne et al., 2015; Kehler & Rohde, 2013), and suggests that predictability and topicality are related, at least for this construction (Arnold, 2010; but see Shuang & Arnold, 2019, for evidence from implicit causality verbs). On the other hand, these findings also support separate representations (Kehler & Rohde, 2013), since gaze only affected predictability, and print exposure affected each differently. This leaves many open questions, and ongoing work is further testing the relationship between print exposure and predictability judgments.

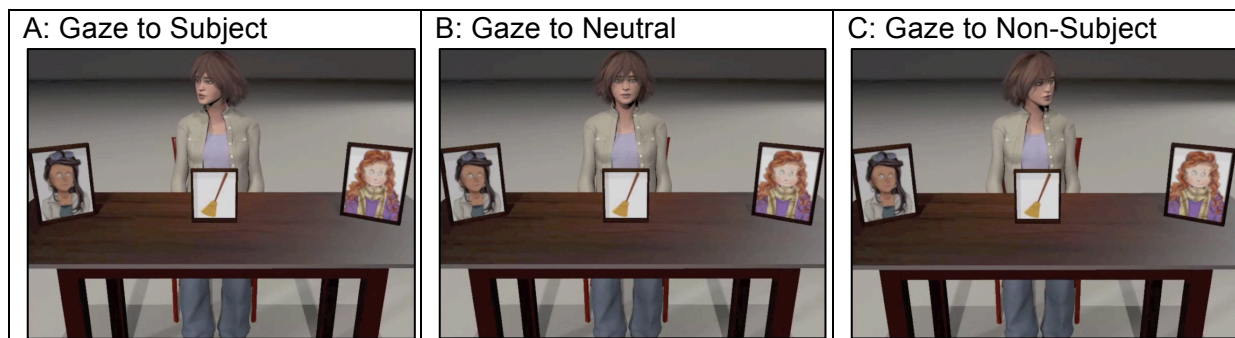


Fig1. Example stimuli. The narrator says, “Ana is cleaning up with Liz” and then gazes at either the subject (Ana, A), the center (Neutral, B), or the non-subject (Liz, C).

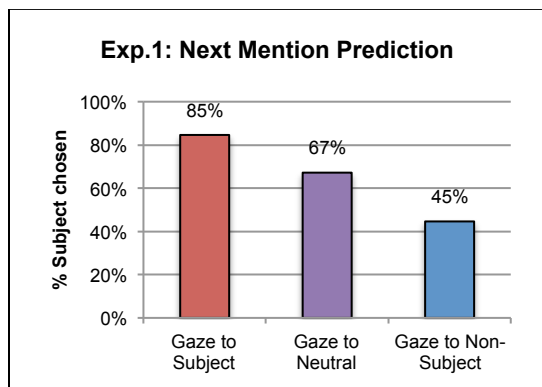


Fig2. Overall subject bias, effect of gaze.

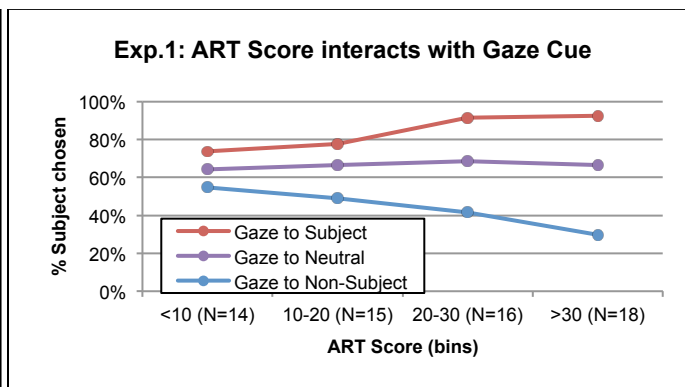


Fig3. ART score interacts with gaze cues (excluding two ppts for guessing (incorrect/correct > 50%)).

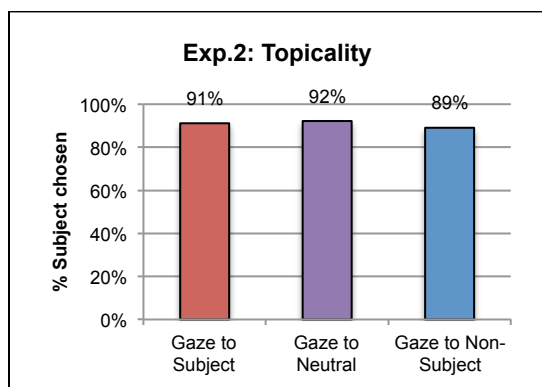


Fig4. Overall subject bias.

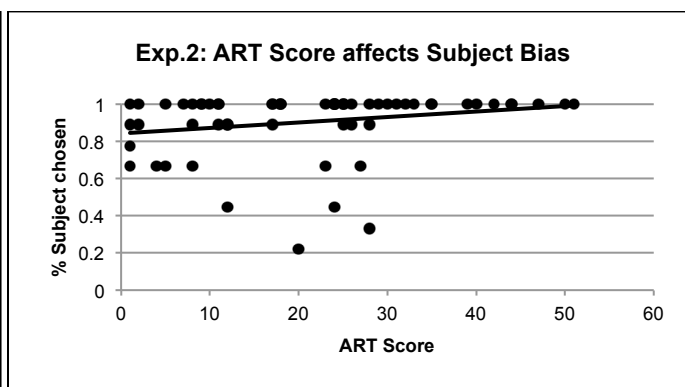


Fig5. Main effect of ART on subject bias (excluding two ppts for guessing (incorrect/correct > 50%)).

References

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