



# Semantic Role Predictability Affects Reference Form

Elise C. Rosa, Jennifer E. Arnold



## Background:

Many factors influence choice of referring expression, including grammatical role and recency of mention. The role of predictability in referential choice is contested, however. One model (Kehler & Rohde, 2013) argues that predictability does not influence this choice, while other evidence (Arnold, 2001) suggests that the predictability of goals (vs. sources) increases the speaker's use of pronouns to refer to goals.

## Current question:

After controlling for grammatical role, do participants use pronouns more often when referring to goals of the previous sentence as compared to sources? How is this related to predictability?

**Task design:** Pairs of sentences and illustrations were created which described a Clue-like murder mystery. Participants created continuation sentences for the first sentence in each pair (online completion experiments), described the pictures presented (in-person experiment), or made rating judgment about the events and their predictability (rating studies).

## Online sentence completion experiments:

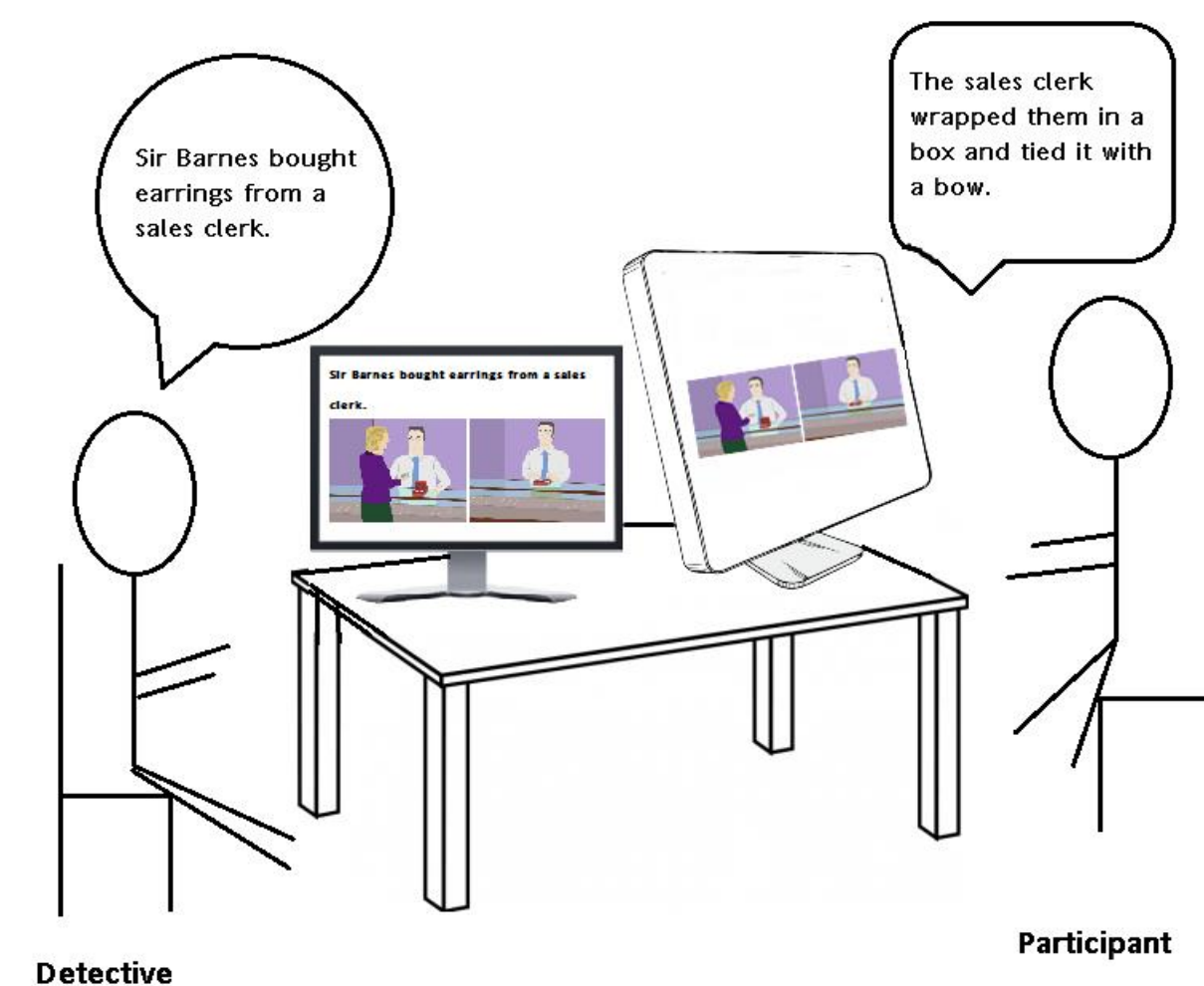
Who do participants prefer to refer to? Do they use pronouns to refer to goals more than sources?

Lady Mannerly gave a painting of the two of them to Sir Barnes.

Then he hung it on the wall.

## In-person experiment:

Do participants use more pronouns to refer to goals as compared to sources in a more interactive setting?



## Rating experiments:

Do participants rate goal continuations as more predictable or related than source continuations? Who do participants think will be talked about next?

### Event Predictability



0=not at all related/predictable 7=entirely related/predictable

How related is the second event to the first event?							
How predictable is the second event based on the first event?							

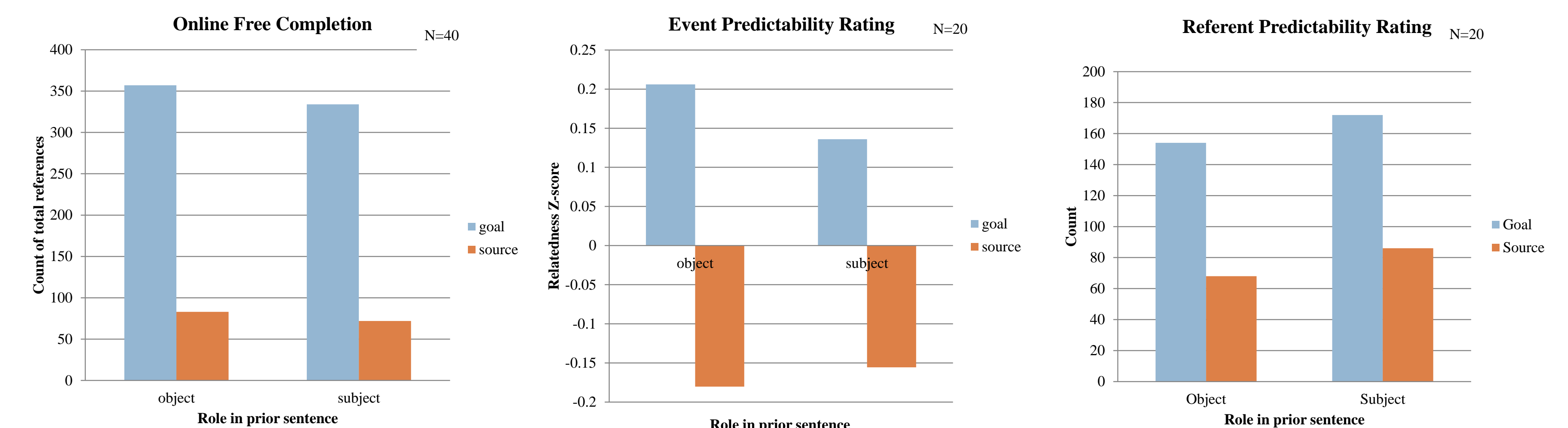
### Referent Predictability



## Results:

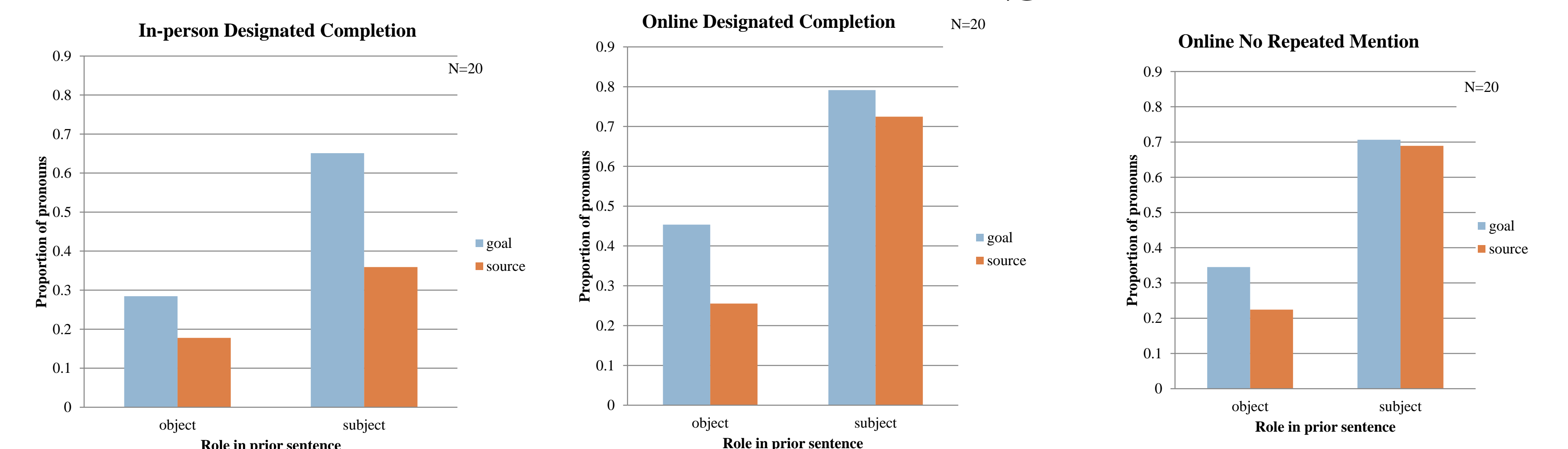
**Analysis:** Data were analyzed with multilevel logistic regressions with SAS proc glimmix, including random intercepts for participant. Models included control predictors when they predicted the dependent variables, e.g. order of presentation.

Are goals more predictable than sources? **YES**



- Participants prefer to talk about goals ( $p < .0001$ )
- Goal continuations judged to be more related than source continuations ( $p < .0001$ )
- Goal characters judged to be more likely to be talked about next ( $p = .0015$ )

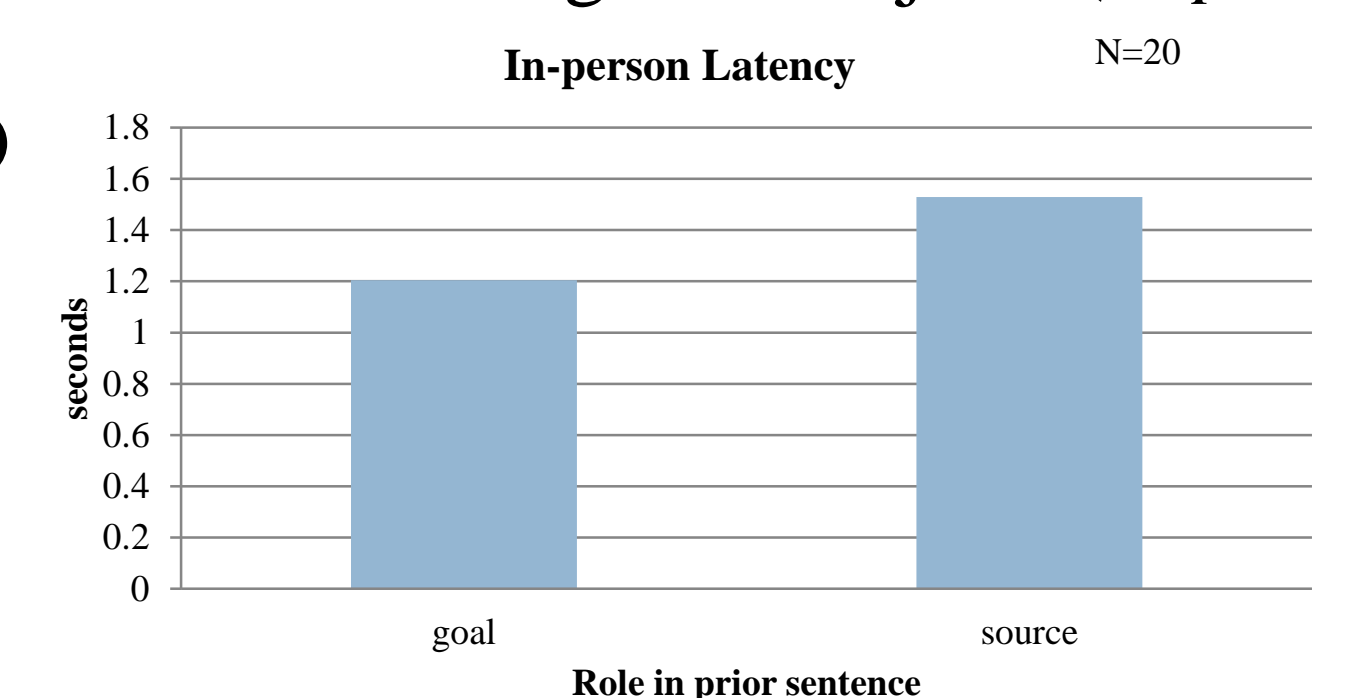
Do speakers use more pronouns for goals? **YES**



- More pronouns for goals vs. sources ( $p = .0002$ ) and subjects vs. objects ( $p < .0001$ )
- Effect stronger for subjects (X:  $p = .03$ )
- More pronouns for goals vs. sources ( $p = .0011$ ) and subjects vs. objects ( $p < .0001$ )
- More pronouns for goals vs. sources ( $p = .0030$ ) and subjects vs. objects ( $p < .0001$ )
- Effect stronger for objects (X:  $p = .0524$ )

Is latency to begin speaking affected? **YES**

- Preliminary data indicates that speakers have longer latencies to begin speaking when referring to sources of the prior sentence as opposed to goals ( $p = .0033$ ).



## Discussion:

Semantic role predictability affects choice of referring expression. Participants used more pronouns to refer to goals of the previous sentences than sources. This effect appears to be robust as it can be found both with traditional sentence completion experiments and in a more naturalistic, interactive setting. Rating studies suggest this effect may be driven by participants' expectations about what character is most likely to be talked about next, and how related the two events are. Both the event and referent predictability measures were significant predictors of pronoun use in the in-person study. These effects can be seen in addition to the known effects of grammatical role. Semantic role predictability therefore acts as a partial constraint on participants' choice of referring expression. When referents are more predictable, more reduced expressions, such as pronouns, are warranted.