



Cloze Completions Reveal Misinterpretation of Noncanonical Sentences

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Background:

Ferreira (2003): The wrong argument is sometimes identified as the agent in sentences with non-canonical order, and this tendency interacts with plausibility.

Who was the “do-er” of the verb?

Sentence	Accuracy
The dog bit the man.	99
The man bit the dog.	99
The man was bitten by the dog .	88
The dog was bitten by the man .	74

Bader & Meng (2018): Despite overt case marking, German speakers show a similar effect of order (though no interaction between plausibility and order).

However, plausibility judgments were accurate in all conditions. Reading span (working memory) was correlated with AGENT report accuracy, but not with plausibility judgment accuracy.

Is a post-interpretive retrieval process the cause of apparent mistakes in the interpretation of non-canonical sentences?

Sentence	Do-er?	Plausible?
Der Koch hat den Topf gereinigt. The chef NOM has the pan ACC cleaned.	95	92
Der Topf hat den Koch gereinigt. The pan NOM has the chef ACC cleaned.	76	90
Den Topf hat der Koch gereinigt. The pan ACC has the chef NOM cleaned.	87	91
Den Koch hat der Topf gereinigt. The chef ACC has the pan NOM cleaned.	61	87

References and Thanks:

Bader, M., & Meng, M. (2018). The misinterpretation of noncanonical sentences revisited. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 44, 1286.
Chow, VV. Y., Smith, C., Lau, E., & Phillips, C. (2016). A “bag-of-arguments” mechanism for initial verb predictions. *Language, Cognition and Neuroscience*, 31, 577-596.
Ehrenhofer, L., Rao, N., Buffinton, J., Lau, E., Phillips, C. (2018). Competing predictions drive N400 sensitivity to argument role reversals. Presented at the 31st Annual CUNY Sentence Processing Conference, Davis, CA.
Ferreira, F. (2003). The misinterpretation of noncanonical sentences. *Cognitive psychology*, 47, 164-203.
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Question and Key Findings:

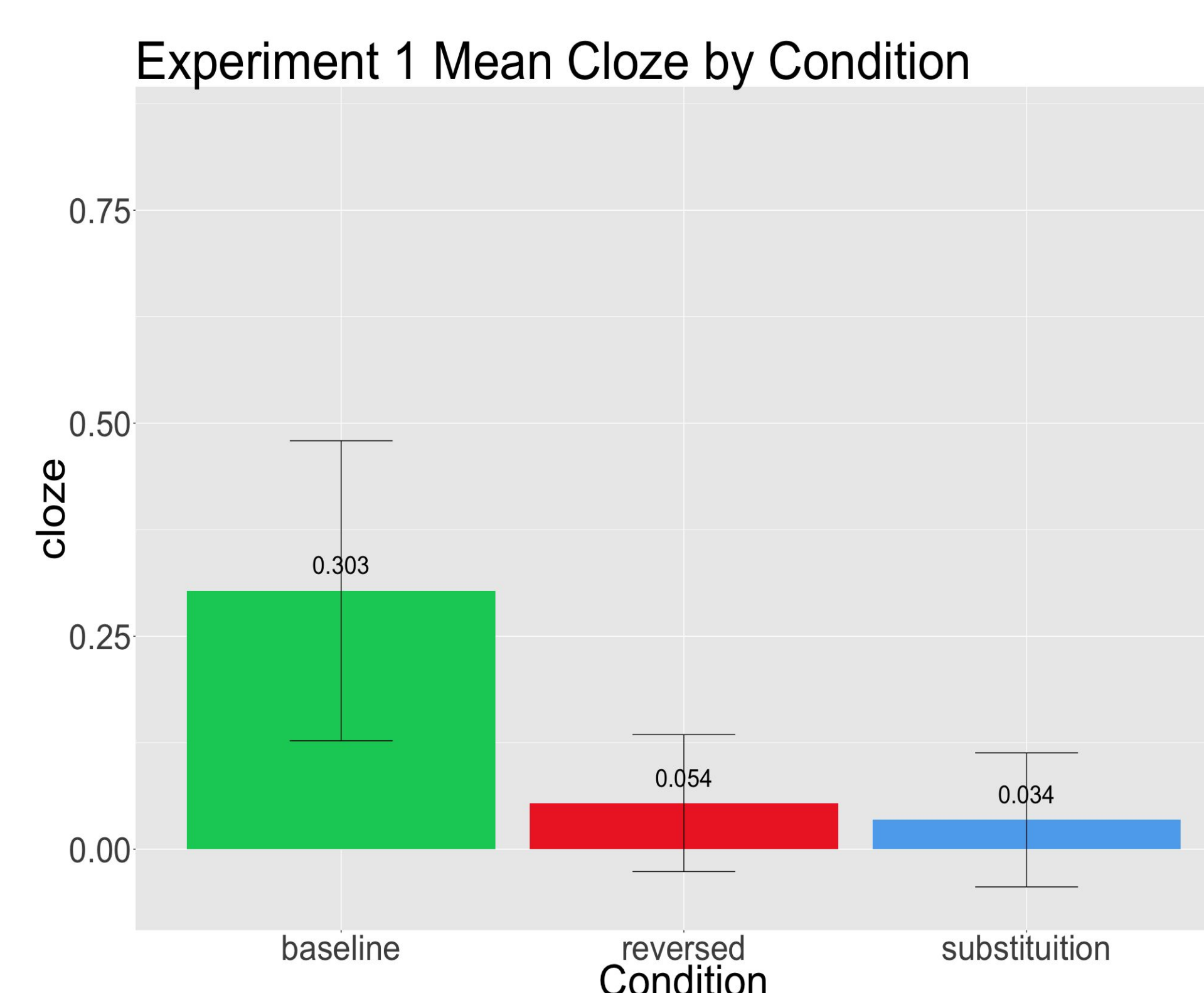
Do comprehenders properly assign thematic roles in noncanonical sentences in the course of incremental processing?

- We observe verb cloze responses that are consistent only with a reversal of thematic roles.
- The rate at which such verbs are produced is strongly related to cloze probability in a version of the sentence with the roles flipped.

Experiment 1:

120 MTurk workers provided cloze completions for 62 sentence fragments (36 adapted from **Chow et al. (2016)**):

Condition	Sentence
Baseline	The surfer saw which fish the shark had ... ____ (<i>eaten</i>) The nurse knew which patient the doctor had ... ____ (<i>treated</i>)
Reversed	The surfer saw which shark the fish had ... ____ The nurse knew which doctor the patient had ... ____
Substitution	The surfer saw which fish the sailor had ... ____ The nurse knew which patient the seamstress had ... ____

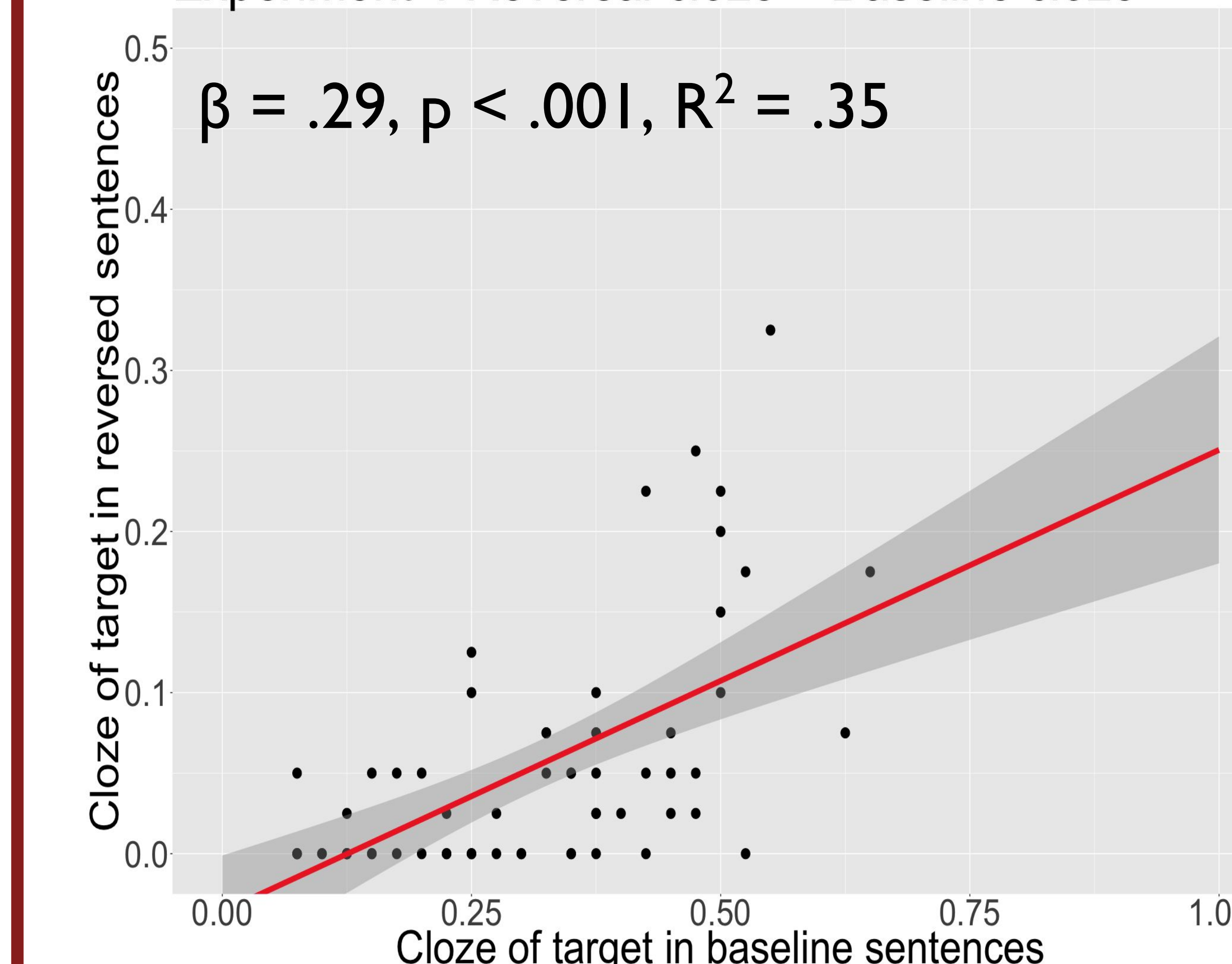


The fragment was visible throughout. The most common response in the baseline condition (*eaten*) was deemed the “target.”

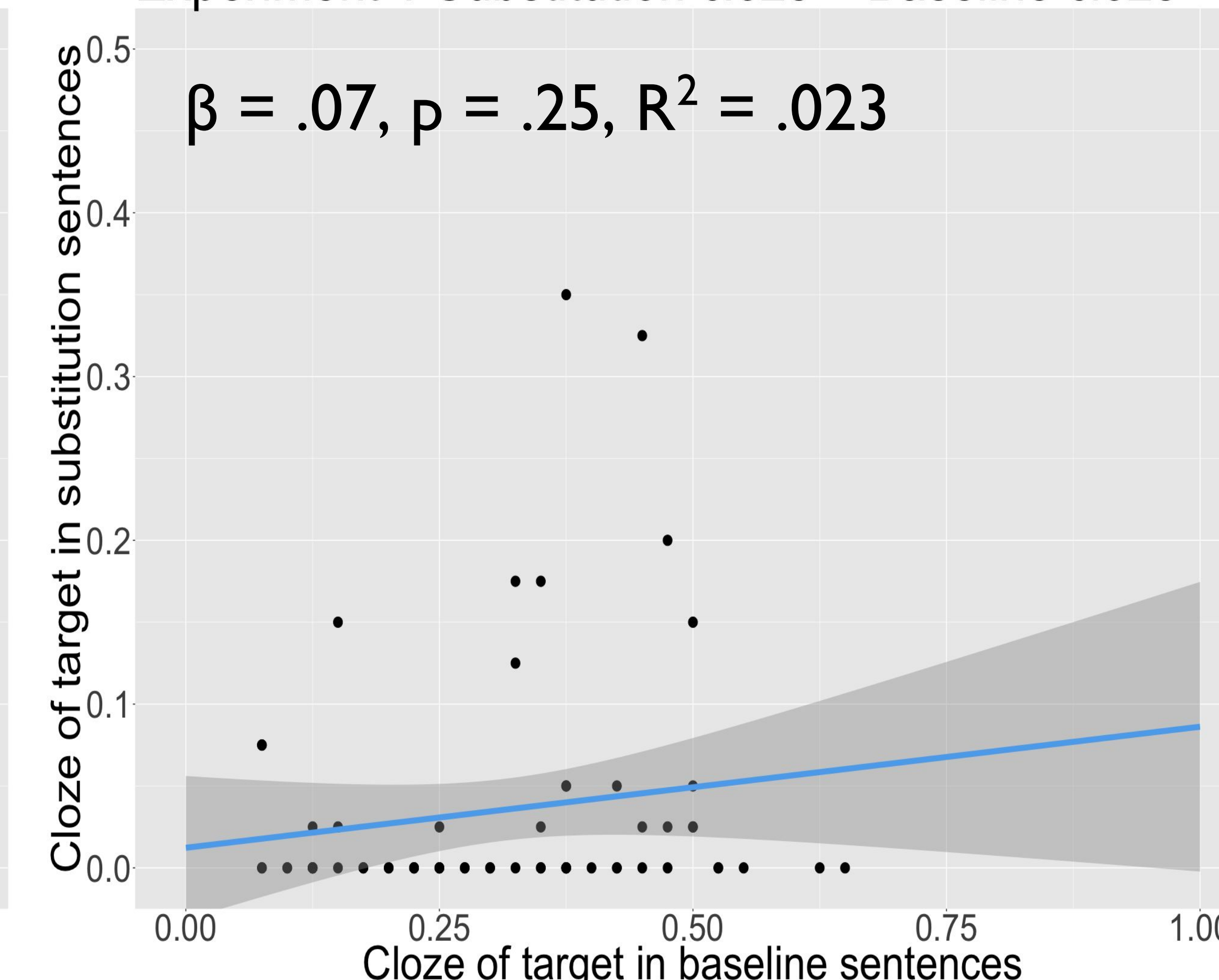
Mixed Effects Logistic Regression: Target cloze (visible to the left) was lower in the Reversed condition than the Baseline condition ($p < .001$), and lower still in the Substitution condition ($p = .005$).

Reversed cloze and Baseline cloze were correlated; Substitution cloze and Baseline cloze were not.

Experiment 1 Reversal cloze ~ Baseline cloze



Experiment 1 Substitution cloze ~ Baseline cloze

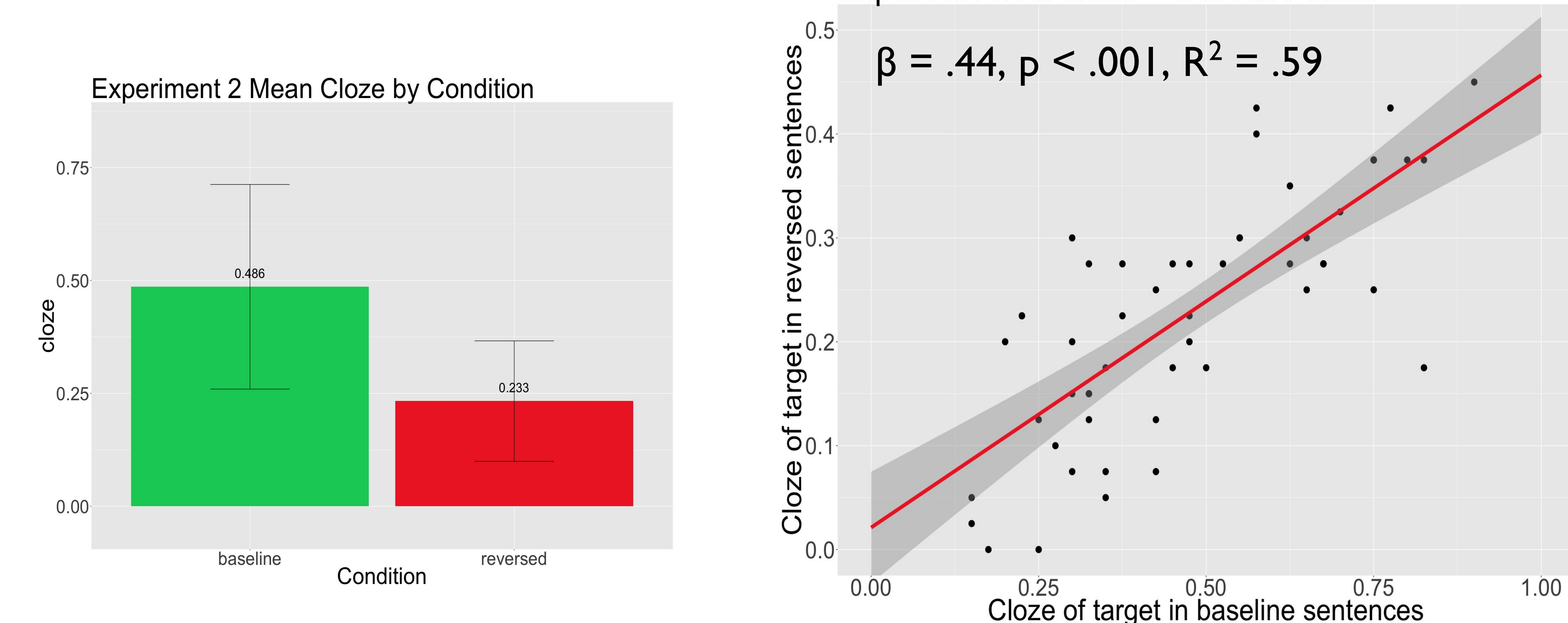


Experiment 2:

Producing ‘eaten’ in the Reversed condition of E1 does not show unequivocally that thematic roles were switched. In E2, 80 MTurk workers provided cloze completions for 54 sentence fragments in which the target verb was implausible in the Reversed condition.

Condition	Sentence
Baseline	The teacher saw which pencil the student had ... ____ (<i>sharpened</i>) The photographer forgot which dress the model had ... ____ (<i>worn</i>)
Reversed	The teacher saw which student the pencil had ... ____ The photographer forgot which model the dress had ... ____

Higher target cloze overall than in E1, both in Baseline and Reversed conditions. Strong linear relationship between cloze values: As target cloze increased in the Baseline condition, it increased in the Reversed condition.



Takeaways and Looking ahead:

Comprehenders frequently misassign thematic roles, and do so incrementally. Cloze completions suggest that in this construction, they reverse agent and theme almost half of the time.

- Chow et al. (2016) found no difference in N400 at the verb for Baseline and Reversed conditions, proposing that verb predictions in OSV clauses are made without consulting thematic roles. This effect emerges **in the cloze responses themselves**.
- Consistent with other evidence for difficulty in assigning thematic roles in comprehension of object relatives, similar to embedded wh-questions (e.g., Gordon & Lowder, 2012).

Questions:

- Does the plausibility judgment task (Bader & Meng, 2018) highlight thematic computations in ways the cloze task doesn't?
- Are comprehenders building illicit syntactic, not just thematic, parses of the input?
- Do comprehenders sometimes reverse roles in the other direction (cf Ehrenhofer et al., 2018)? E.g. “The restaurant owner knew which {waitress / customer} the {customer / waitress} had ... {tipped / served}”